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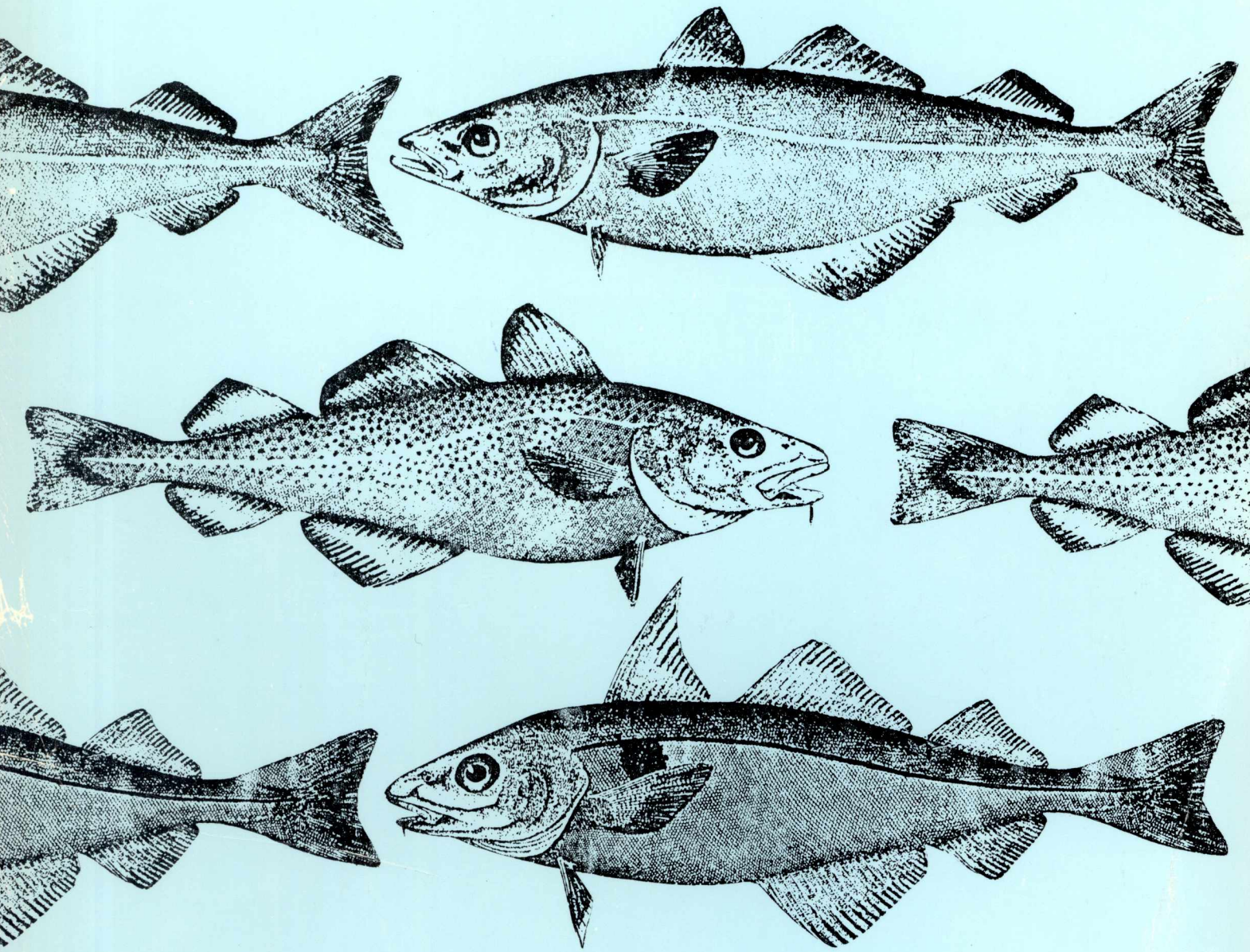
Report of the Scotia-Fundy Groundfish Task Force



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Report Of The Scotia-Fundy Groundfish Task Force

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Chairman

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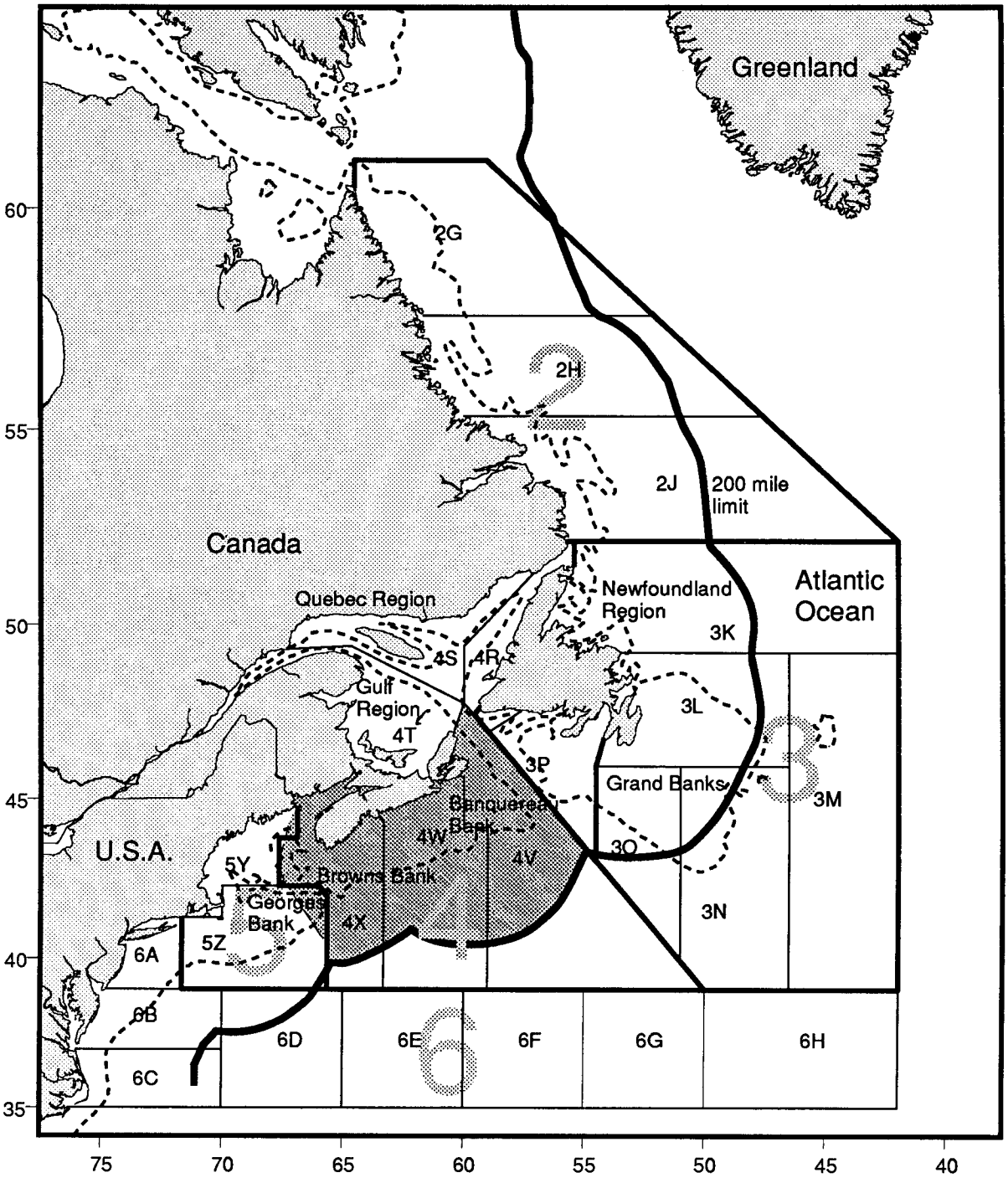

Figure 1: Canada's East Coast showing the Divisions used by the North Atlantic Fisheries Organization (NAFO).
Scotia-Fundy Region highlighted.

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EXECUTIVE SUMMARY

This report was commissioned by the Minister of Fisheries and Oceans, the Honourable Tom Siddon, in July 1989. It makes recommendations for changes to the management of the groundfish fishery in the Scotia-Fundy Region.

Since 1983, total allowable catches (TAC's) of groundfish have been decreasing in most Scotian Shelf and Georges Bank stocks. This has affected all fleets, but particularly those entirely dependent on groundfish. Immediate action became necessary at the end of June as most of the groundfish fishery was closed to the inshore mobile gear (dragger) fleet, resulting in plant closures, layoffs and general hardship. The consequent disruption in the supply of fish to inshore plants prevented the entire inshore groundish industry in the Region from functioning normally for the balance of 1989.

Meanwhile, the offshore industry was also suffering from repeated decreases in annual groundfish quotas on the Scotian Shelf, and from cuts and indications of more cuts in northern cod quotas. Two major plants closed permanently during 1989, and National Sea's large plants closed on two-month rotations to spread out the effects of the shortage of fish supplies.

It was the cumulative effect of these problems that led to the formation of the Scotia-Fundy Task Force. A separate Task Force had been organized a few weeks earlier to examine the northern cod issues.

The fishery is of major importance to the economy of the Scotia-Fundy Region, especially to rural areas of both Nova Scotia and Southwestern New Brunswick. The Scotia-Fundy Region - which extends from the tip of Cape Breton to the U.S. border - generates 46% of the value of the $1 billion Atlantic groundfish fishery. Many rural communities and small towns depend almost exclusively on the fishery for their livelihood. Total regional employment in groundfish fishing and processing in 1988 was estimated to be about 8,700 full-time equivalent jobs. These were about equally split between the **inshore** (independently owned vessels under 100' supplying relatively small independently owned processing plants) and **offshore** (vertically-integrated companies with large processing plants supplied by vessels over 100'). Generally the industry provides good incomes to fishermen and plant workers. These jobs are vital because of their concentration in rural areas which have very few alternative employment opportunities.

Fisheries management has come to involve much more than conservation and protection of fish stocks. Regulation of the fishery has gone through an evolutionary process and now concentrates as much on socioeconomic aspects as on traditional resource management. As steward and manager of the resource on behalf of the people of Canada, DFO must strive to promote stability as well as an appropriate level of economic efficiency in the industry in order to maximize the fishery's contribution to the Canadian and regional economy. To achieve this with minimum government intervention in the private sector is a complex and controversial task. In addressing the issues, the Scotia-Fundy Groundfish Task Force has endeavoured to develop management approaches which will minimize intervention, maximize overall returns and ensure that benefits of the fishery are distributed equitably to various fleet and processing sectors and participants.

The groundfish fishery has undergone major expansion since the extension of Canadian jurisdiction to 200 miles in 1977. Since 1981, DFO has been forced to increase intervention in an attempt to control fishing effort and to contain growth in fishing capacity which has tended to erode and dissipate overall benefits. The Department has continually tried to extend fishing (and processing) activity throughout each year while maintaining an equitable allocation of groundfish available for harvest to all concerned.

The early closure in 1989 confirmed that these efforts have not been very successful, particularly for the inshore mobile fleet. The condition of the groundfish fishery today is one of excess fishing capacity resulting in fleet inefficiency and what many see as unfair distribution of available fish among user groups.

The fishery is also plagued by overfishing and misreporting, less than satisfactory levels of monitoring, surveillance and enforcement, and in the inshore, a relentless increase in harvesting capacity. There is widespread criticism of DFO management policies and operations and the general credibility of the Department has been seriously eroded.

There is legitimate concern about the condition of the three major commercial groundfish species, cod, haddock and pollock — especially haddock. The haddock stock has been exploited at two to four times target levels since 1984. Scientists warn that if this trend continues the stock may collapse completely.

Although levels of the cod and pollock resource are not as critically low as haddock, there is reason for concern. Cod landings are 30% below long-term averages. While there are encouraging signs of strong incoming recruitment, great care must be exercised to prevent overharvesting that would impede potential stock recovery. Pollock landings are above long-term averages, but reduction of the harvesting rate is recommended by scientists since the current high exploitation rate of the fish available for harvest will cause losses in future catch.

As requested by the Minister, the Task Force conducted an intensive round of more than 30 public meetings throughout the Scotia-Fundy Region. No attempt was made to defend the existing management system. The intent was to listen, seek constructive criticism and solicit new ideas and suggestions from all concerned. Little or no consensus emerged on the nature or extent of the problems or on possible solutions.

Subsequent analysis by the Task Force tended to reconfirm previous studies which had concluded that the excessive catching capacity of the inshore fleet, particularly the mobile gear sector, is the major underlying problem which must be solved over the short to medium term if a turnaround in the groundfish fishery is to be achieved.

None of this would surprise those familiar with the characteristics of competitive commercial fisheries around the world. There is a wealth of evidence showing that any competitive commercial fishery based on commonly-held, publicly-owned fisheries resources will inevitably lead to excessive investment and harvesting overcapacity. This is a result of the inherent desire of individual fishermen to catch as many of the fish as possible before someone else does - a race for the fish. This tendency applies to nearly all competitive exploitation of publicly-held resources.

In the case of the Scotia-Fundy inshore groundfish fleet, increases in the number of vessels have been held back by DFO. But the intent of these regulations has been circumvented by dramatic increases in the harvesting capacity (fishing power) of existing vessels. The trend toward replacement of smaller, less powerful vessels with larger, more sophisticated, higher capacity ones continues despite a decade of strict control of vessel licences and increasing limits on their use.

As we move into the 1990's **two major trends are evident - declining stocks and increasing fishing capacity**.

The Task Force proposes that industry and government focus on these two fundamental problems in order to stabilize the industry and ensure that the benefits of the fishery are maximized to the advantage of Canadian citizens generally, and equitably distributed to all who are more immediately dependent on them for their livelihood. Harvesting capacity and the overinvestment straining economic viability in the industry must be reduced as quickly as possible. More effective long-term measures to keep harvesting capacity and effort in balance with the amount of fish available for harvest must be put in place and strictly enforced. High capacity/investment operators must be persuaded to address their own capacity problems in a manner that does not have a negative effect on the balance of the industry. The traditional inshore fishery of independent fishermen must be protected. Inactive licences, which potentially could add to overall harvesting capacity and effort, must be addressed with minimal confrontation and hardship. Fisheries management must aim for industry stability, and participants in the fishery encouraged to approach decision-making with a broader, long-term focus. Any real possibilities to divert existing capacity into underutilized species of fish must be explored and achieved. Nontheless, government intervention and expenditures must be kept to a minimum.

In response to unresolved fisheries management problems and other issues raised in the consultation process, and in support of a proposed restructuring of the inshore groundfish fleet, the Task Force offers an integrated set of some 30 recommendations on a variety of subjects pertaining to the Scotia- Fundy groundfish fishery. These recommendations are grouped by subject area, as follows:

Conservation

This section includes recommendations for specific closed fishing areas to protect juvenile fish or spawning fish, or in exceptional circumstances, to provide a haven for endangered stocks; a larger minimum trawl mesh size (140 mm square mesh) which is carefully matched to a legal minimum fish size of 17"; new requirements for use of biodegradable netting in gillnets; and other recommendations directed at protection of the resource and its environment.

Commercial Catch Monitoring

The Task Force recommends sweeping changes in the industry's requirements to report fully and accurately fishing activities as well as subsequent sales of fish. Problems with obtaining timely and accurate data in the past have led to overfishing of quotas, and made the scientific assessment of stocks more difficult and costly.

Enforcement

Advice in this area concerns increasing fines and the use of the Minister's authority to cancel or suspend licences as well as enhancing the legal abilities of courts to fit the punishment to the offence.

Science

These recommendations focus on getting better information on the fisheries through cooperation with fishermen, and on increasing research in areas such as the geographical distribution of groundfish species and their relationship with their enviornment.

International

The advice is to pursue discussions with the Americans to improve management of Georges Bank stocks, and to have the cod, haddock and pollock bycatch from the silver hake fishery delivered to Canadian plants.

Communications

The Task Force has seen evidence that DFO's communication of intentions, methods, activities, and of fisheries science and economics is sorely in need of attention. Education programs are recommended. Also the committee structure through which the industry advises fisheries managers needs attention, and the Task Force recommends joint industry - DFO - provincial consultations on this issue.

Fleet Management

An outline of the recommendations for a new structure for inshore fleet management follows:

The Task Force recommends that fishermen in the Scotia-Fundy inshore groundfish fleet **be given a choice** of participating in one of three new fleet management combinations.

Group A would include small boats operating on day trips - boats whose individual catches have been historically low and which individually have a low potential to cause negative effects on the stock and the industry. The group would consist only of fixed gear fishermen. These boats would carry on a traditional, seasonal fishery of less than six months per year that would not be subject to premature closure. The major management control would be a trip limit in the range of 1,500 kg.

All inactive licences would be placed in Group A. In all cases these currently inactive licences would be non-transferable and would be cancelled when the current holder no longer had a use for it.

Although it is difficult to predict which group fishermen would choose, the Task Force estimates that Group A would be the largest of the three with about 900 active and about 1,000 inactive licences.

Group B would consist primarily of fixed gear fishermen but would also include a few small-scale flounder fishermen using mobile gear. Often operating on multi-day trips, Group B fishermen would require more fish than envisaged by the trip limit control on Group A. Group B would basically function on a management regime not unlike the current one, with a fleet quota. Fishing by the whole group would be subject to closure when their quota was caught. The Task Force estimates some 400 licence holders would find this management approach most appropriate to their operations.

Group C would be specifically structured to accomodate and contain the highly capitalized, high capacity mobile gear fleet. Operators in this fleet now require more fish to go into covering their expenses than is legally available for them to harvest and more than is consistent with an equitable allocation to other sectors. The Task Force estimates Group C would contain about 400 licenced draggers.

While the group's capability to disrupt the balance of the industry would have to be strictly controlled, individuals in Group C would be provided with significant flexibility to choose, as a group, a fleet management system acceptable to themselves and to DFO. These choices could include a strictly enforced group quota, individual quotas (IQ's) or individual transferable quotas (ITQ's). The group could also collectively opt for some type of self-funded licence retirement scheme. As licences are retired, individual shares of the overall group quota of fish would rise. In all cases DFO would provide whatever administrative assistance it could to reduce the overall harvesting capacity.

While individual quotas (IQ's) or individual transferable quotas (ITQ's) would be new to the inshore groundfish fleet in Scotia-Fundy, they are far from an untested idea. The offshore Enterprise Allocation (EA) scheme, working successfully in the Atlantic fishery since 1982, is an example of such an approach which provides a licence to harvest a specified amount of fish per year. Similar arrangements also exist in the inshore mobile gear groundfish fleet on the west coast of Newfoundland, the Lake Erie fishery, the Scotia-Fundy offshore scallop fishery and in the Scotia-Fundy herring seine fishery. Arrangements in these fisheries have been proven to address the fundamental problem of overinvestment in the race for fish.

Similar IQ and ITQ systems, established in response to the same fundamental problem, are working successfully in other parts of the world, notably in Iceland, Australia and New Zealand. DFO is currently initiating further studies on the applicability of such individual quota regimes to other Canadian fisheries.

To support the management scheme for Group C, individual members of this group would be charged higher annual fees in the thousands of dollars. These funds could be used to initiate or administer self-funded licence retirement schemes as developed by the group and agreed to by DFO. They might also offset the substantial catch monitoring and enforcement costs associated with an IQ or ITQ program. Such fees appear high, but it must be remembered that the Crown is providing an exclusive annual allocation of large quantities of a public resource. Extensive consultations and in all likelihood, a substantial industry/DFO management and administrative infrastructure would be necessary were the group to decide to adopt some individual quota or licence retirement scheme.

A list of recommendations is provided in Appendix IV; the rationale for each precedes the recommendations throughout the report.

The Task Force has attempted to realistically estimate and fully disclose all of the significant management and administrative requirements of the recommendations. The successful implementation of these is entirely dependent on the cooperation of industry, provincial governments and DFO. Political resolve on the part of government, funding, supporting management and administrative structures and patience are required to allow the solutions to take shape.

The Task Force believes that in encouraging the industry to solve its own overcapacity problem through the above arrangements, the Scotia-Fundy Groundfish Fishery has a promising future — one in which its potential to make significant contributions to the benefit of Canadians in general, and those in regional coastal communities in particular, can be realized.

1. INTRODUCTION

By the end of June 1989, the Scotia-Fundy inshore mobile gear fleet had caught most of its 1989 groundfish quota. The resulting closure of that fishery for the remainder of the year caused plant shutdowns, layoffs, a general disruption of fish supply to inshore plants and severe hardship for all those dependent on the entire regional groundfish fishery. Many felt that this closure was a symptom of fundamental ills in both the fishery and how it is being managed.

On July 12, 1989, the Minister of Fisheries and Oceans, the Honourable Tom Siddon, commissioned the Scotia-Fundy Groundfish Task Force. Its mandate was to develop an action plan to deal with the problems of the Scotia-Fundy groundfish industry. The study was to develop recommendations leading to — in the words of its mandate — "long-term stability and prosperity in the groundfish fishery". It would take into consideration:

- the adequacy of existing scientific advice on the state of the stocks;
- the impact of present harvesting plans and of fleet and gear sector interaction on the resource;
- the effectiveness of effort and conservation controls;
- the impact of the existing fleets on the resource, especially in terms of their harvesting capacity;
- the effect of any reduction in harvesting capacity on employment levels, income and the viability of vessel and plant operations;
- alternative economic opportunities and programs which may be available to assist the industry in any period of adjustment.

The Minister further directed the Task Force to undertake consultations with those involved in and affected by the problems in the groundfish fishery. A copy of the Terms of Reference is provided as Appendix I.

The study involved cooperation and input from the fishing industry. Hundreds of fishermen, plant workers and representatives of various groups, companies and associations made the effort to present their opinions and suggestions at over 30 public meetings, some of which, because of the urgency of the situation, were held on short notice. Significant contributions and support were received from other Departments and agencies such as Canada Employment and Immigration (CEIC) and the Atlantic Canada Opportunities Agency (ACOA), as well as from boards of trade, municipal and provincial officials and representatives, Members of Provincial Legislatures and Members of Parliament.

The Task Force was headed by Jean-Eudes Haché, Regional Director-General, Scotia-Fundy Region, Department of Fisheries and Oceans (DFO) and was made up of a core group consisting of John Angel of the Fisheries and Habitat Management Branch of the Scotia-Fundy Region of DFO, Leo Brander from the Economics Branch and Bob O'Boyle of the Biological Science Branch. Significant contributions were also made by Jean Antonescul, Gerry Black, Leslie Burke, Bob Huggins, Gregory Peacock, Brenda Reid and Jonathan Rogers. The Task Force would like to acknowledge the administrative support of Melanie Anderson, Diane Appleby, Pat Comeau, Julie Gagnon and Stephanie Kussmaul.

In the course of its work the Task Force made several interim reports to the Minister of Fisheries and Oceans and to the Special Committee of Cabinet on Atlantic Fisheries. DFO Ottawa staff assisted the Cabinet Committee in coordinating the efforts of the Northern Cod Task Force chaired by K.L. Stein, the Harris Commission on DFO's stock assessment process under Dr. L. Harris and the Scotia-Fundy Groundfish Task Force, thus ensuring compatible approaches to common issues.

The report has been structured under two major headings — **Background**, which very briefly reviews the objectives, history, resource outlook and socioeconomic context of the Scotia-Fundy groundfish fishery, and **Task Force Findings**. The latter section highlights what the Task Force heard in public consultations and presents analysis and recommendations. Various appendices provide further detail and elaboration.

The report focuses on the specifics of the current groundfish situation in the Scotia-Fundy Region and associated significant short and long-term issues. As such, it is not intended to provide a long, detailed history of events leading to the current state of affairs and deliberately avoids lengthy reviews of the theory of stock and fisheries management.

2. BACKGROUND

2.1 *Objectives of Fisheries Management*

During the 1980's, the Atlantic fishery has been guided by three objectives, all cast within the mandate of DFO to conserve and protect fish stocks:

- the industry should be economically viable;
- employment in the industry should be maximized subject to the condition that those employed receive a reasonable income; and
- the industry should be Canadianized as much as possible.

The emphasis on economic viability, income and employment reflects an evolution in the philosophy of fisheries management from an exclusive focus on conservation to a concern about the economic and social impact of fisheries management decisions. This shift has not undermined the importance of conservation, but rather indicates an increased appreciation that conservation alone is not enough. The familiar "race for fish" leads to too much investment in fishing capacity, which puts the fishing industry in a fragile financial state even when fishing is controlled well enough to protect the stocks. A downturn in catches or prices or both can ignite an economic crisis in the industry.

There are two related issues implied but not specifically addressed in the list above, and which should be of concern to both the fishing industry, and the Canadian taxpayer. These are:

i) Stability

The long-term well-being of communities is adversely affected by large changes in landings from year to year, and by seasonal unemployment of fishermen and plant workers. Stability and prosperity in fishing communities is directly related to stability in the fisheries.

The groundfish fishery is still a highly seasonal activity. Much of the inshore industry responds not to natural catch rates or markets, but primarily to quota openings and closings. Fishermen want to fish whenever weather permits. Plant workers suffer from irregular employment, and the uneven supply to markets affects the entire industry in the long-term. Where practical, fisheries management policies should seek to allow market forces and prices to interact with natural forces and catch rates in harvesting, processing and marketing to determine seasonal variations.

Longer-term variability in fish stocks may be caused by natural recruitment fluctuations, overfishing, or both. While recruitment - numbers of young fish entering the population - may be beyond our control, overfishing should not be. Fish stocks should be managed not only to ensure their survival, but also to even out extreme fluctuations in annual catch.

ii) Economic Efficiency

While ensuring stock health and stability, fisheries management should not impose unnecessary costs and inefficiencies on the industry. In recent years, while fishing capacity was increasing, closed areas, low trip limits, and seasonal quotas have been used to minimize the effects of this capacity. This imposed an unnecessary strain on both Departmental enforcement resources and on fishermen. Preventing over-investment in capacity in the first place is a more efficient solution than restraining excess capacity to protect stocks after the fact. Control over the composition and size of the fleet should be an important feature of fisheries management.

Fisheries management employs public resources to generate private gain. The process should be made as efficient as possible to minimize the cost to Canadian taxpayers. Management has evolved towards a system demanding a high degree of administrative, scientific and enforcement support while manpower and financial resources have been declining. In this light more efficient management measures must be sought. In addition, the management regime should be designed to encourage fishermen to become more efficient, which should in turn produce more benefits overall.

2.2 History of Management Measures

The extension of jurisdiction to 200 miles in 1977 encouraged expansion in the harvesting and processing sectors of the groundfish fishery. The departure of the foreign fleets was viewed by Canadian fishermen and federal and provincial governments as the opportunity to rebuild stocks and with them the Canadian fishing industry itself. Conservation and socioeconomic goals consequently became the objectives put forward for managing the fishery.

Progress was made toward these objectives. The health of the stocks improved and a major expansion of the fleet and of the processing sector occurred. This was particularly advantageous for the inshore fleets and the processing plants they supported. Limitation of catch through quota became a major regulatory tool and comprehensive harvesting plans were developed based on removal of about 20% of the available biomass. Initially only the offshore fleets were subjected to quota management, but as expansion of the inshore fleets intensified quota management was applied to that fleet as well in late 1981.

The expansion in vessel capacity was dramatic as the industry tried to react quickly to the new harvesting opportunities. Difficulties soon arose however, as increases in capacity continued and eventually surpassed stock growth. Federal loans and incentives to construct groundfish vessels were phased out in the early 1980's although some provincial governments continue to operate loan boards for the construction of new vessels. The federal Government attempted to limit growth by freezing the issuance of new mobile gear licences and introducing restrictions on the size of replacement vessels. Nonetheless, fishermen continued to expand the fishing power of their vessels by investing in items not restricted by vessel replacement regulations such as more sophisticated fish-finding electronics, larger engines, deeper-draft hulls, more efficient types of gear, etc. Since no mechanisms existed to remove excess capacity, management increasingly focused on measures designed to control effort and to try to distribute the resource among competing groups in the industry. Specific measures taken during the 1980's included the following:

1980	❑	Categorization of fishermen (part-time/full-time).
1981	❑	Quota management for all fleet sectors.
1982	❑	Sector management for vessels less than 65' (Scotia-Fundy/Gulf/Newfoundland).
	❑	Enterprise Allocations (EA) for vessels greater than 100'.
	❑	New restrictive vessel replacement guidelines (5' intervals/110% hold capacity - the latter proved unenforceable)
1984	❑	EA program for vessels greater than 100' extended to 5 years.
1986	❑	Extensive use of condition of licence restrictions and trip limits.
	❑	Moratorium on inactive mobile gear licences attempted - withdrawn.
1987	❑	Haddock nursery area closure.
1988	❑	EA program for vessels 65' - 100 '.
	❑	Scotia-Fundy Capacity Committee Report.
	❑	Separation of inshore fleets into under 45' and 45' to 64' sectors.

1989
- ❑ Treatment of NAFO areas 4X+5 as one management area with a cod, haddock, and pollock combined quota.
- ❑ EA program for vessels greater than 100' extended another 5 years.
- ❑ New vessel replacement guidelines to stop capacity growth.

For the inshore fishery, a combination of effort and capacity controls have reduced fishing areas, catch levels, operating flexibility and fishing time of vessels. The intention was to extend the season for vessels and fish plants and ensure that the small inshore vessels obtain a "fair share" of available resources. Unfortunately, measures to control effort promote inefficiency by keeping productive capacity from producing. As economic pressures mounted, many inshore fishermen in the fleet began to circumvent the controls by misreporting species, amounts and area of capture. The overall result is that effort controls have not restrained capacity growth, have led to animosity between DFO and the industry, have promoted misreporting and have not been fully effective at allocating resources or protecting stocks. An experiment conducted in 1989 involving a combined cod, haddock and pollock quota alleviated some reporting problems and may have improved data quality. But measures aimed at containing capacity growth have not been effective. Specific initiatives for reducing inshore capacity such as the licence moratorium and the Capacity Committee proposal were resisted and have not been implemented.

For the offshore fleet, an Enterprise Allocation (EA) program was introduced in 1982. The program was developed to slow down the race for fish and encourage orderly fishing by offshore companies, particularly for northern cod. Generally the program has had positive results but discarding and highgrading of fish at sea continue as problems associated with EA programs, and costs make monitoring difficult at times. Even though difficulties remain, this system which can function with little government interference to regulate capacity has produced positive results and was extended in 1989 for a further 5 years. In addition EA's were introduced in the midshore fleet (65' - 100') in 1988, on a voluntary basis and the program continued in 1989. Problems with the legal framework and with monitoring and enforcement hamper the extension of EA programs to fleets which contain large numbers of small vessels.

2.3 Resource Outlook

In 1988, groundfish landings by Canadian vessels operating in the Scotian Shelf/Georges Bank area totalled almost 200,000 metric tonnes (t), 78% of which was cod, haddock and pollock (Figure 2).

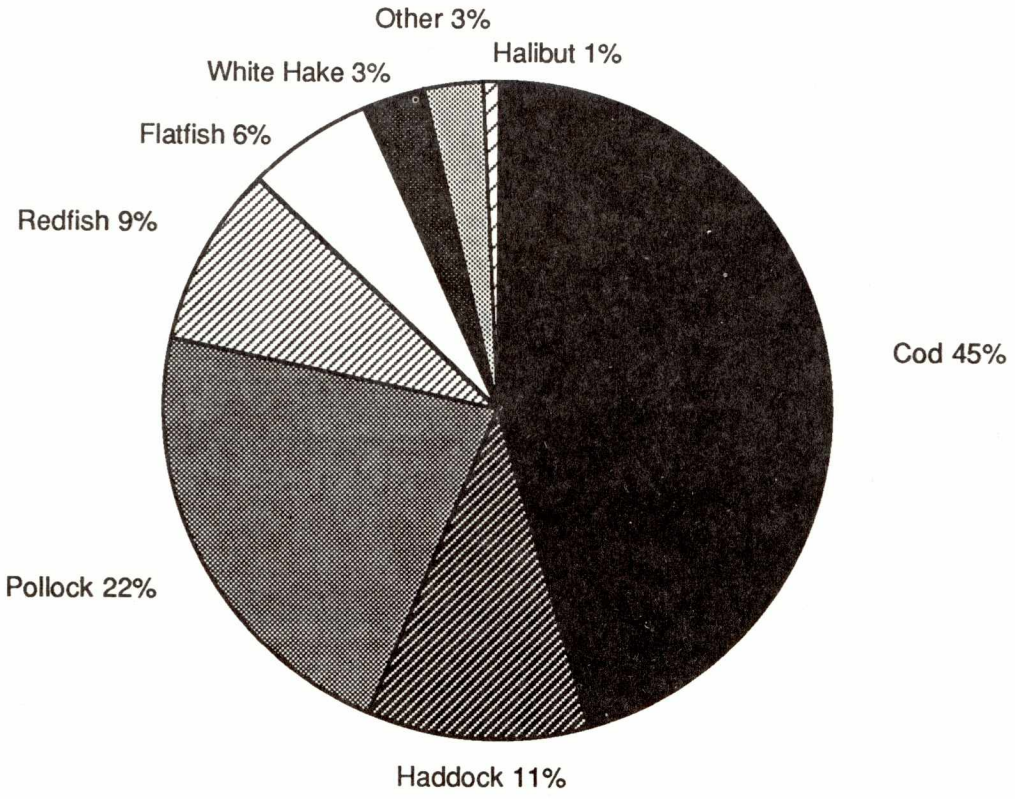

Figure 2: Species Composition of the 1988 Canadian Groundfish landings reported from NAFO Div. 4VWX+5Zc.

Whereas the fishery on the northern half of the Scotian Shelf is dominated by cod, that on the southern half is a more equal mix of the three species.

Since 1974, the abundance of cod, haddock and pollock on the Scotian Shelf has first increased and then declined (Figure 3). Haddock stocks have experienced the highest exploitation rates at two to four times the target level during 1984-88, and may suffer a complete collapse. The cod and pollock resources, even though heavily exploited, are not judged to be at critically low levels. Nevertheless, for all three species, the consequences of continuing the high exploition rates will be a furtherance of the trend towards smaller populations composed of, on average, younger and thus smaller fish. Fishermen will take more time and effort to catch fewer and smaller fish.

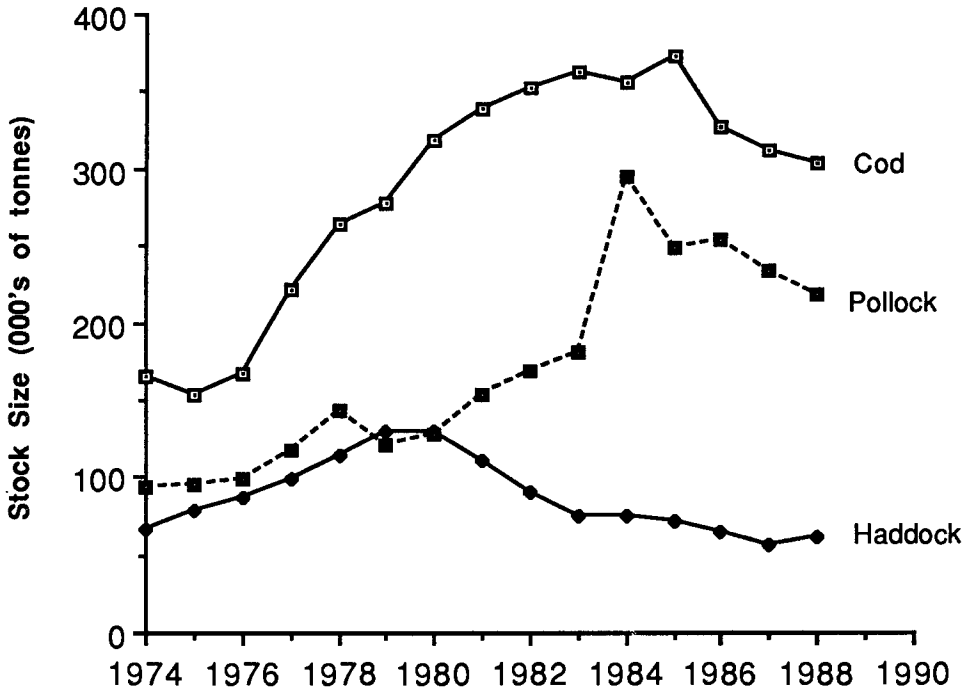

Figure 3: Trends in stock size of Cod, Haddock and Pollock on the Scotian Shelf

Brief summaries of the state of these species follow. The trends discussed represent average conditions across the entire Scotian Shelf and they may not reflect the experience of all fleet sectors operating in different geographic areas. Fishing vessel catch rates are also influenced by differences in the ages of the fish caught by each of the fleets and the intensity of local aggregations caused by factors such as seasonal migrations.

Haddock

Three distinct stocks of haddock inhabit the waters of the Scotia-Fundy Region. They spawn on Sable Island Bank, Browns Bank and Georges Bank in the spring and migrate seasonally over a broad area. Long-term average landings[1] from these combined stocks have been about 50,000t annually. During 1986-88 landings were almost half this with a further reduction to 20,000t expected in 1989. Due to a combination of high market demand and excess fleet capacity, exploitation of all three stocks has been exceptionally high since the early 1980's. Almost 50% of the available resource is currently being harvested each year. This is causing a loss in the potential for stock growth and has contributed to the dramatic decline in stock size during 1980-89. Present abundance of mature haddock (fish generally longer than 17") is the lowest ever recorded. This reduction has been accompanied by decreases in the average fish size and age

[1] *Based on total landings from NAFO Division 4VWX and 5Zj+m*

of the population as well as in the number of year classes contributing to the catch. Whereas in the late 1970's about four or five age groups often dominated landings, in recent years this has dropped to two. This situation is extreme on Georges Bank where the 1987 year class alone will be the main contributor to the fishery in the near future. The reduction in stock size and concentration of harvesting activity on a limited number of young age groups has raised concerns about the spawning capability of the stocks. On the Scotian Shelf about 15-20% of the stock available to fishing are juveniles and thus too immature to spawn. This figure is higher on Georges Bank. Pulses of strong year classes entered the fishery during the mid 1970's and early 1980's. Since then, there have been no encouraging signs as recruitment levels continue to drop. The high exploitation rates, if continued, may result in a stock collapse.

Cod

The long-term average landings for the four cod stocks in the Region (Sydney Bight, North-Central Scotian Shelf, Browns Bank and Georges Bank) are about 100,000 t annually. The 1986-88 average is 94,000 t with a further decline to 70,000 t expected by the end of 1989. Biological sampling indicates that after a relatively high peak of recruitment in the 1977-82 period, more recent recruitment to the fishery has been weak. This combination of strong followed by weak year classes has caused a decline in population size since 1985. In the northern area of the Scotian Shelf, where exploitation rates have been about 24% of harvestable stock per year, this trend has been less dramatic than in the southern Browns/Georges Bank area where exploitation rates have recently averaged about 35%. There have been some encouraging signs of strong incoming recruitment, particularly of the 1985 year class, but it is still too early to make confident predictions. Although the situation is relatively stable in the north, the high exploitation rates at the southern end of the Shelf have caused a loss of growth-related yield. Contrary to the haddock situation however, the percentage of immature cod (fish less than 17" long) being caught is relatively low — being generally less than five percent. In addition, the stocks (with the exception of Georges Bank) consist of a number of strong year classes. Thus the current exploitation rates are not likely to result in long term stock damage. However, further declines in yield will occur, particularly in the Browns/Georges Bank area, if recruitment to the resource does not improve and the present high exploitation levels continue.

Pollock

Although separate spawning sites have been located on Sable, Browns and Georges Banks, the extensive migratory behaviour of pollock requires management of all these as one unit. Long-term landings from the Scotian Shelf and Canadian part of the Gulf of Maine area have averaged about 36,000 t annually. Since 1986, this has risen to 44,000 t, primarily on account of the entry into the fishery of several strong year classes, particularly those of 1979 and 1982, during the 1981-85 period. Stock size increased to a peak in 1984 and has dropped slightly since. About four age groups currently dominate the landings. The present exploitation rate of 30% of harvestable stock per year is somewhat higher than the optimum level of 20%, but is not likely to have a negative impact on the stock, only the economics of fishing it. In addition, immature age groups (fish generally less than 21" long) are not being heavily exploited. Nevertheless, since 1983, recruitment has fallen steadily and will cause the decline in stock biomass to continue into the near future. It is advisable to reduce the harvest rate moderately in order to make the best use of the stock's growth potential during the coming period of decreasing stock size.

2.4 The Socioeconomic Context of the Fishery

The groundfish fishery is important to the economy of the Scotia-Fundy Region, particularly as its impact is almost entirely on small towns and rural communities where alternative employment is scarce. The contribution of this fishery to local economies varies considerably over different parts of the Region.

Employment Dependence on Groundfish

Employment in the groundfish industry can be measured in a number of ways, with different results. One way is to measure the amount of work involved in harvesting and processing groundfish. This estimate of **full-time-equivalent** jobs was 8,669 in 1988 for the Region, including both inshore and offshore vessels and plants. A full-time-equivalent job in this case means 12 months of employment in a fish plant, or a full season of groundfish fishing for a crew member on a vessel. Two people working half a year each would add up to one full-time equivalent job. These estimated numbers are presented by County in Table 1.

Table 1
Employment Estimates,
Fishing and Processing Groundfish

County	Groundfish Landings, 1988[1] - tonnes -	Full-time Equivalent Jobs[2]
Lunenburg	53,552	1,733
Shelburne	42,392	1,603
Cape Breton	42,450	1,576
Guysborough	44,290	1,433
Halifax	9,845	473
Digby	16,035	447
Richmond	12,746	435
Yarmouth	13,412	409
Queens	7,286	254
Victoria	3,050	148
Charlotte	2,742	129
All Others	793	29
Scotia-Fundy Region	248,593	8,669

[1] *Landings from all Atlantic stocks.*

[2] *DFO estimates based only on landings in each county, by gear type and vessel size. Includes harvesting and processing.*

Another measure of employment is the total number of full-time fishermen (all fisheries) in the Region, plus the "normal" number of jobs available in plants. This provides a much larger number than the first measure. It is larger because many of these plant jobs last only a few weeks or months, and many fishermen included in this total are fishing groundfish only part of the season or not at all. This second set of numbers is provided by County in Table 2 along with a calculation of this job estimate as a proportion of the total county labour force. In five counties this percentage exceeds 20% of the labour force. Three of these five are the prominent inshore groundfishing counties of western Nova Scotia.

Table 2
The Fishing and Processing Labour Force
All Fisheries

County	Number of Plant Jobs and Fishermen[1]	Percent of County Labour Force
Lunenburg	2,052	9.9
Shelburne	3,718	45.9
Cape Breton	1,940	3.8
Guysborough	1,061	20.4
Halifax	771	0.5
Digby	2,844	27.9
Richmond	539	11.8
Yarmouth	3,227	26.9
Queens	764	13.8
Victoria	341	8.3
Charlotte	2,779	23.1
All Others	815	0.6
Scotia-Fundy Region	20,851	4.75

[1] *Plant jobs are number of employees in a normal shift, from DFO* ***Plant Capacity Survey 1986****. Fishermen are full-time registered fishermen. Fishermen and plant workers include both groundfish-related and others.*

Fishermen's Incomes

Statistics Canada data on net taxable earnings from tax files can be used to compare trends in income levels over time. In 1976, the average total income of taxfilers in Scotia-Fundy was slightly higher than the average total income of the 8,200 taxfilers who reported fishing income. By 1985 average income for all taxfilers was not quite double its 1976 level, but the average for fishermen taxfilers had almost tripled. More recent data is not yet available but the value of landings suggests even the current industry problems will leave fishermen at least as well off as in 1985.

Taxfiler information was also used to compare average net incomes of fishermen with all workers on a county by county basis. Results of the comparison are shown for 1985 in Figure 4. Shaded areas represent counties where fishermen taxfilers outperform their county's average earned income. The "plus" percentage figures indicate that fishermen's incomes were higher than the county average, the "minus" percentage figures indicate they were lower. Fishermen taxfilers in 1985 outperformed the average in all of the major fishing counties of Southwestern Nova Scotia and Southwestern New Brunswick. Kings and Colchester Counties, where fishermen's incomes are relatively low, have very few fishermen.

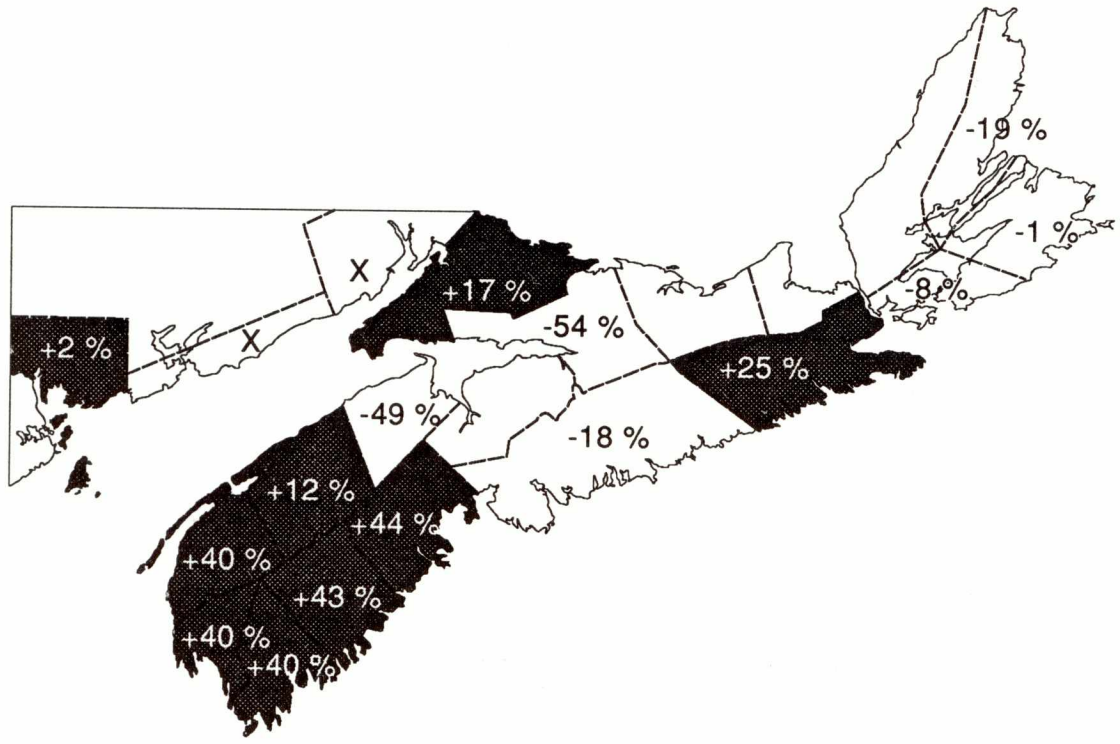

Figure 4: 1985 Fishermen's income relative to the income of all taxfilers by county in the Scotia-Fundy Region.
(Tax data from Statistics Canada).

The Harvesting Sector

The Scotia-Fundy groundfish fleet is comprised of almost 2,800 licenced vessels and several hundred unlicenced handliners. Eighty percent of the licences are for fixed gear vessels under 45' in length, primarily longliners. Tables 3 and 4 provide numbers of licences by gear and size. The catch by gear and size group is not proportional to numbers of licences. Generally catches per vessel increase dramatically as the size of vessel increases. Mobile gear vessels average more catch per vessel than fixed gear boats of comparable size.

Table 3
Scotia-Fundy Vessels and Fishermen, 1989

	Vessels	Fishermen
Registered in all Fisheries	5,900	14,700
Licenced for Groundfish	2,777	
Active	1,500-2,000	4,000-5,000
Inactive	800-1,200	
Handlining Groundfish	800	1,000

Table 4
Licenced Groundfish Vessels

	Mobile Gear[1]	Fixed Gear	Total
Under 45'	312	2,207	2,519
45'-65'	132	67	199
65'-99'	3	10	13
100' and over	44	2	46
Total	491	2,286	2,777

[1] *Includes some licences with both fixed and mobile designation*

As Figure 5 illustrates, all fleets have suffered serious losses of quota on the Scotian Shelf between 1982 and 1989. The proportions of the total allowable catches (TAC's) going to each fleet have been fairly stable, but there has been a slight shift from the offshore to the inshore.

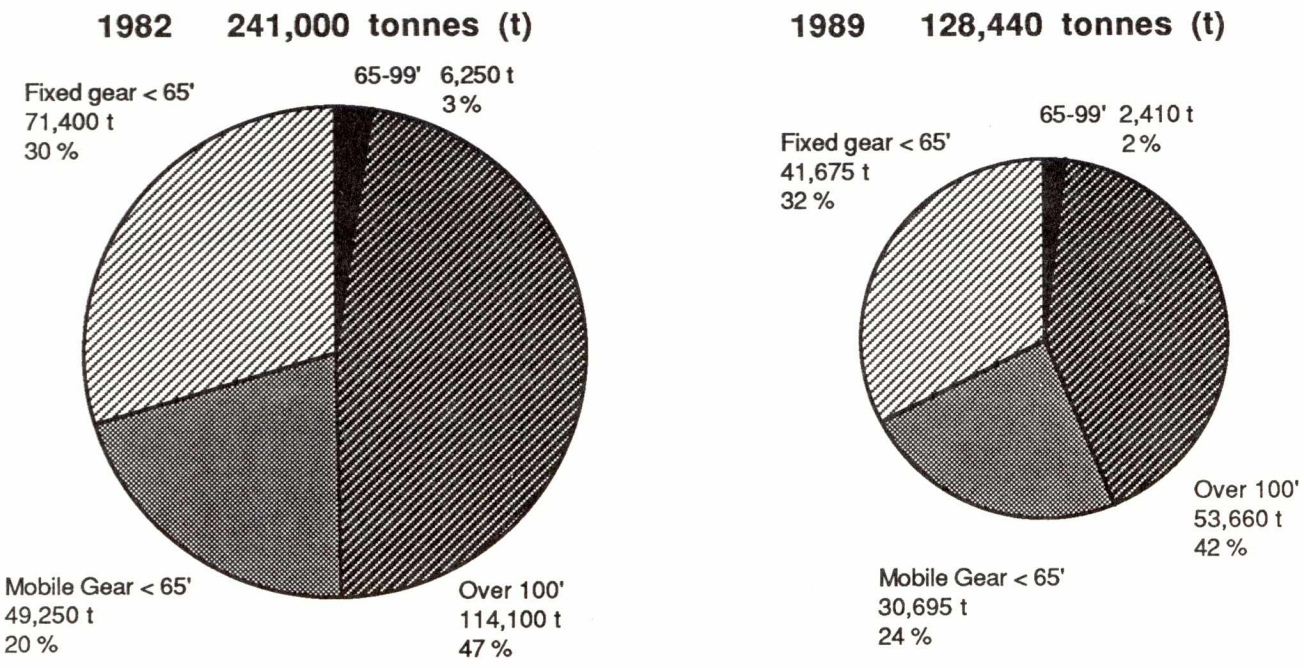

Figure 5: Comparison of 1982 to 1989 fleet allocations of Total Allowance Catches for Scotia-Fundy Region's Cod, Haddock, and Pollock stocks.

The inshore fleets have a large number of licenced vessels that are apparently not active in the groundfish fishery. Based on landings data, there are about 1,000 inactive licences. There are, however, several hundred other small unlicensed vessels engaged in handlining groundfish for commercial sale. This fishery requires only a registered fishing vessel and registration as a commercial fisherman - not a groundfish licence. Handlines are not included in the 2,800 licence total. The great majority of handline and inactive licensed vessels are under 35' in length. Most inshore groundfish fishermen hold commercial lobster licences, scallop licences and licences to fish herring, mackerel and other species.

Table 5
Inshore Draggers (under 45 feet)

	Conventional	Jumbo
Initial Cost	$200,000	$750,000
Average Annual Catch	23 t	200 t

The number of commercial licences and vessels in the Scotia-Fundy groundfish fishery has not increased since 1980, but the fishing power of these vessels has increased dramatically. Capacity has increased primarily through investment in replacement boats. New boats, especially the wide, deep "jumbo" boats, have larger hold capacity, bigger engines, more sophisticated fish-finding equipment and more efficient types of gear. But they remain in the same length class as defined by the replacement rules prior to 1989. These new vessels have created a serious capacity-to-

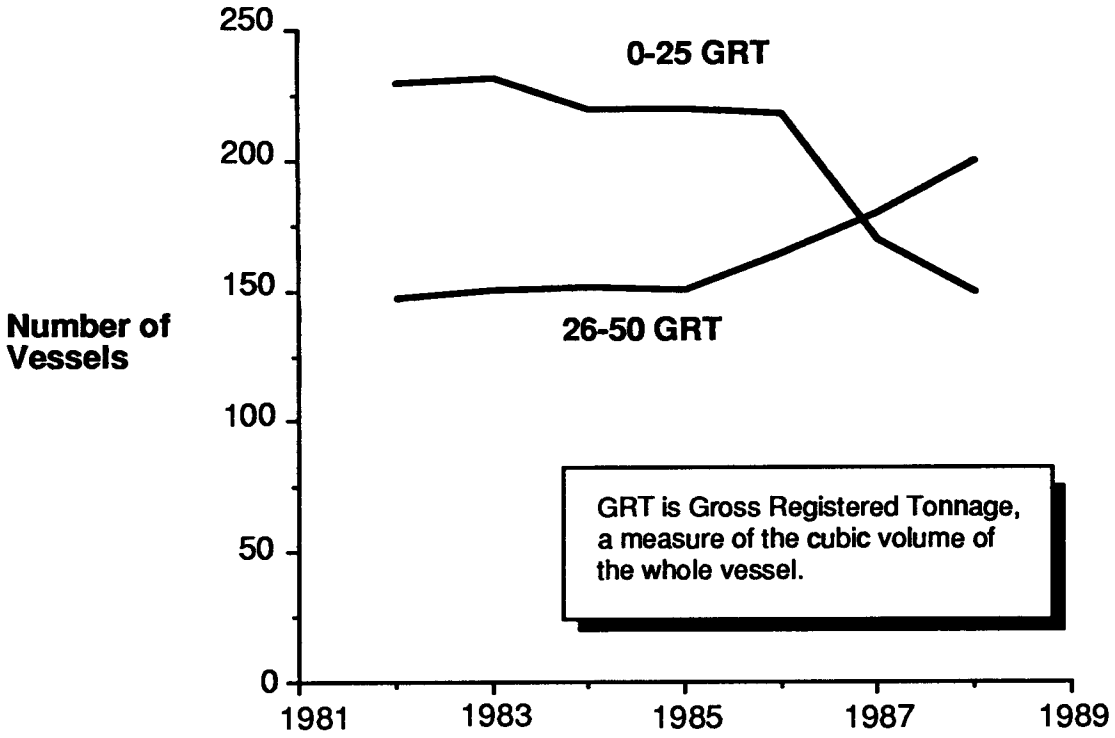

Figure 6: Trends in the number of low capacity (<25 gross tonnes) and high capacity (26-50 gross tonnes) vessels in the Scotia-Fundy Region's Mobile Gear Fleet under 45 ft. in length.

quota imbalance in the inshore dragger fleet. Table 5 compares the investment and catch characteristics of conventional draggers with the "jumbo" variety in the same length class. Figure 6 shows the trend toward replacement of smaller, less powerful vessels with larger ones since 1982.

In Figures 7(a) and 7(b) the age profile of the current inshore mobile gear fleet shows clearly the booms and busts in the boat building industry. The pattern has been very similar for fixed-gear vessels. These booms have been fuelled in the 1980's by earnings and by expectations of future earnings. Rising catches in the 1977-82 period led to a high rate of vessel replacement. Much of the 60-65' dragger fleet was built in this period. In the mid-1980's, catches levelled off. Few new boats were built. But very large groundfish price increases (Figure 8) in 1986 and 1987 fuelled a new burst of activity in boat yards. This time vessel replacement rules and other factors made the fibreglass "jumbo" 44'11" vessel the choice of fishermen. While this boom carried into 1988, it is clearly over now. The groundfish price collapse in 1988, coupled with further quota cuts, reduced the high earnings which fishermen were reinvesting in boats. Meanwhile the new vessel replacement guidelines issued in the spring of 1989 have drastically reduced future potential for fishermen to upgrade lobster boats into powerful groundfish vessels.

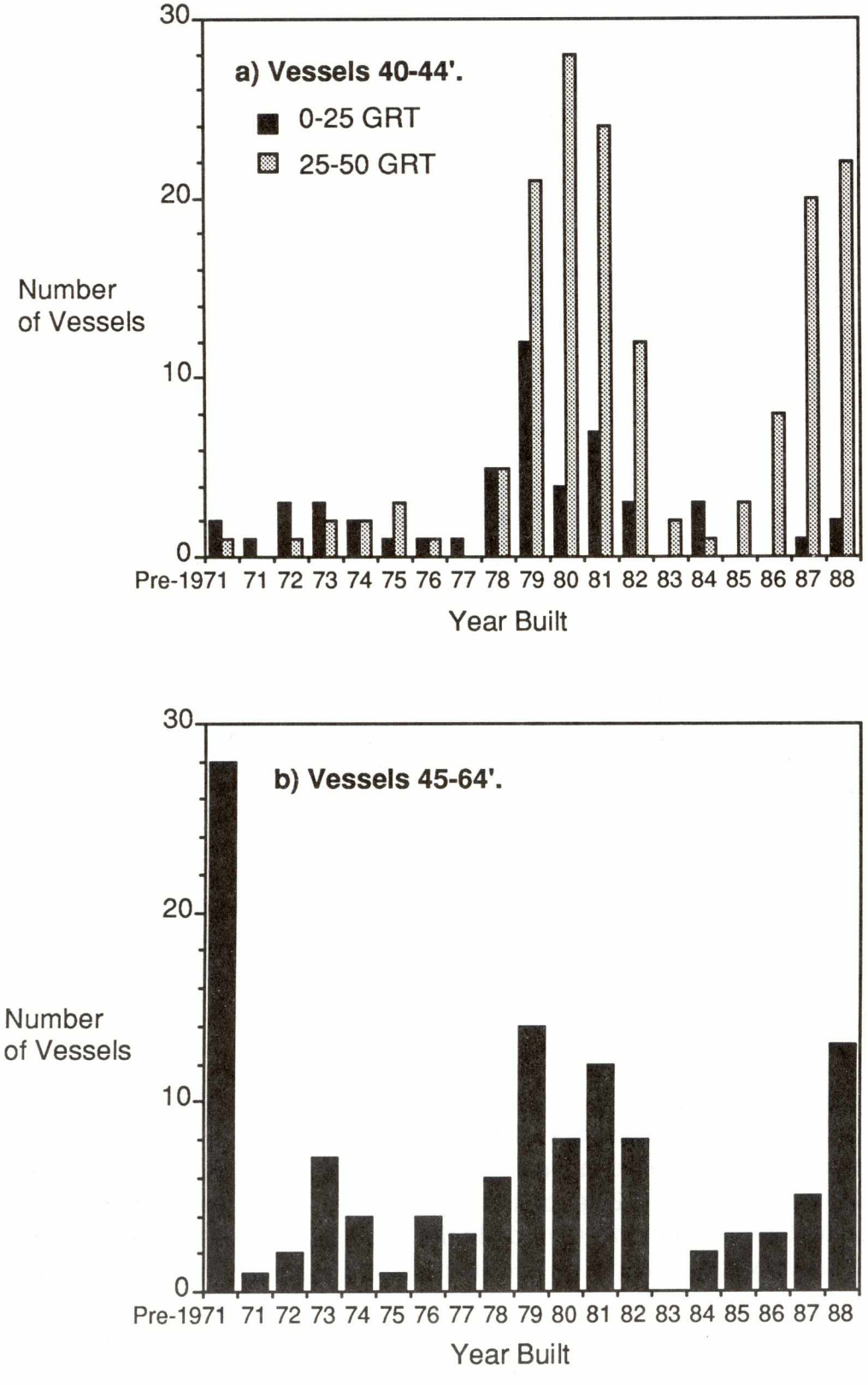

Figure 7: Trend in Vessel Building Activity in the Scotia-Fundy Region for the Mobile Gear Fleet.
a) Vessels 40-44 ft. in length,
b) Vessels 45-64 ft. in length.

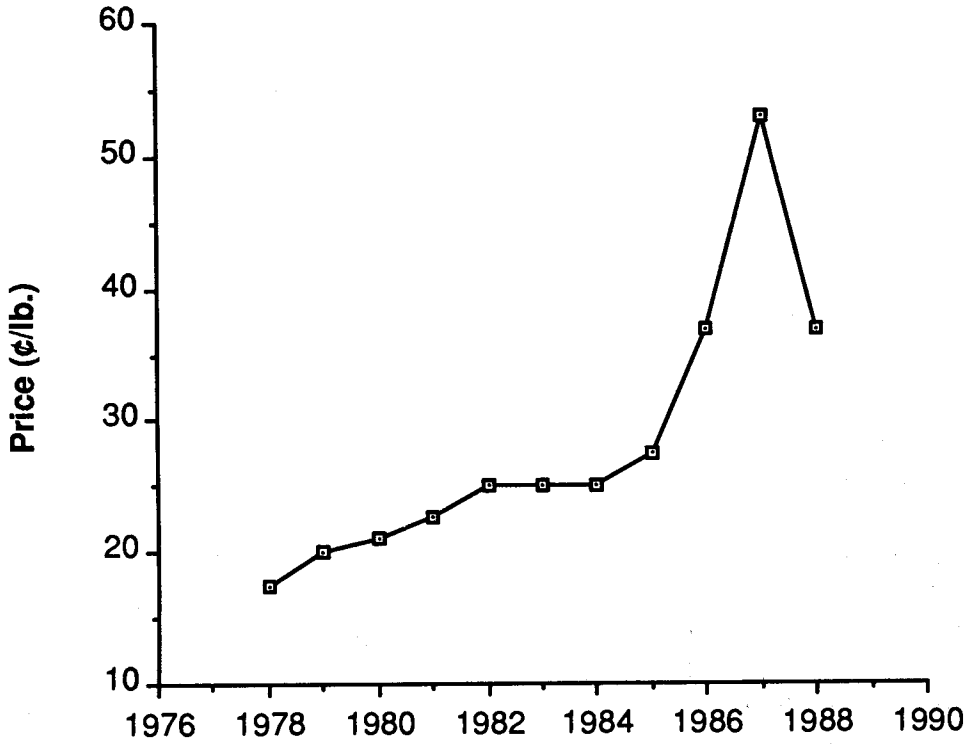

Figure 8: Trends in the dockside average Price per lb. of Groundfish (Cod, Haddock, Pollock) paid to the Scotia-Fundy under 100 ft. Fleet.

Virtually all of the high capacity vessels built since 1978 are still in the fishery. But quotas are back down to 1978-era levels. The resulting large overcapacity has intensified the race for fish, partly because of the competitive nature of fishing, and partly because of the need to catch fish to make large boat loan payments, and to pay the fuel and maintenance costs on larger boats. This competition has led to earlier and earlier quota closures; it has encouraged illegal fishing and misreporting.

The financial problems of inshore draggers will become more obvious shortly. Payments on boat loans tend to come due in June and January. Many boats are expected to miss the January 1990 payment, and some enterprises will inevitably be bankrupted.

Bankruptcy does not necessarily remove the vessel from the fishery, however, as the licence is usually transferred to someone else and the boat sold at a discount to another operator. The financial burden on the fishery is reduced somewhat, but the capacity to fish remains. This has been the pattern in the groundfish fishery for the past decade. Unless the basic management structure is changed, the cycle is doomed to repeat itself - with adverse effects on the stocks and therefore on all fleet sectors.

The Processing Sector

There are currently 390 federally registered fish processing establishments in the Scotia-Fundy Region. About 70% of these are in western Nova Scotia. Roughly 180 plants handled some groundfish in 1989. The offshore fishery supplies only a half-dozen of the largest plants. The value of sales of fish products from Scotia-Fundy plants was $868 million in 1988; about $456 million of this was groundfish products.

About 80% of Scotia-Fundy groundfish production is exported to the United States. Consumer demand for fish in the U.S. increased considerably in the 1985-87 period, as the health benefits of eating fish were publicized. Prices at all levels of the industry increased substantially. Other supplies entered the U.S. market from the North Pacific and other areas to compete with cod, haddock and pollock from Canada. Eating fish fell out of fashion somewhat after 1987, demand dropped and prices fell, although they are still high by comparison with the early 1980's. The strengthening Canadian dollar over the past three years has made Canadian fish more expensive to U.S. buyers. This tends to depress prices and squeeze profit margins for Canadian exporters.

The fish processing industry generally falls within provincial jurisdiction with regards to most government-related issues. The processing sector does not suffer the same inherent weakness as the harvesting sector - that is, the natural tendency to overinvest in capacity. But this sector is suffering, by extension, the problems of the harvesting sector. Overcapacity in fleets shortens seasons and exaggerates "peaks" in landings. Plants may hire two or more shifts of workers to handle the peaks, and then sit idle for much of the year.

Impact of 1989 Crisis

Figure 9 shows monthly groundfish landings in Scotia-Fundy ports by inshore vessels. This supply schedule for raw materials to processing plants creates difficulties in hiring labour, trucking, ordering materials, and selling fish. It can be overcome only by freezing fish before processing, which adds cost and affects quality.

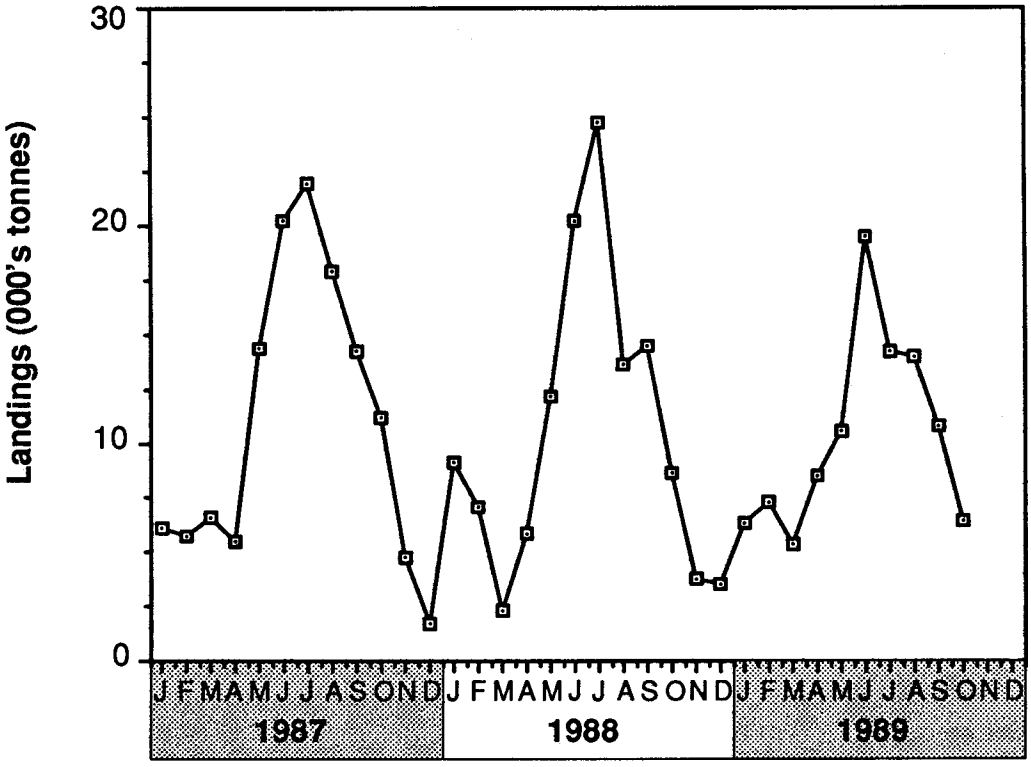

Figure 9: Monthly Trends since 1987 in the Scotia-Fundy under 65 ft. Fleet Total Groundfish (Cod, Haddock, Pollock) Landings.

The high degree of seasonality in processing also makes measurement of normal employment or counting laid-off workers a questionable exercise. Employees in seasonal plants are usually "on call" for work. Layoffs are a routine event, and can last from a few days to several months. Figure 10 shows how fish deliveries looked in 1989 when compared to 1988, month-by-month. The 1989 layoffs occurred in early July, a month earlier than the previous year, due to the shut-down of the dragger fleet. August and later months were not dramatically different in the two years. Using a rough standard of 17 full-time equivalent processing jobs per 1,000 t of fish, the July losses of 10,000 t in landings represent about 170 person-years, or about 2,000 persons out of work for that one month period.

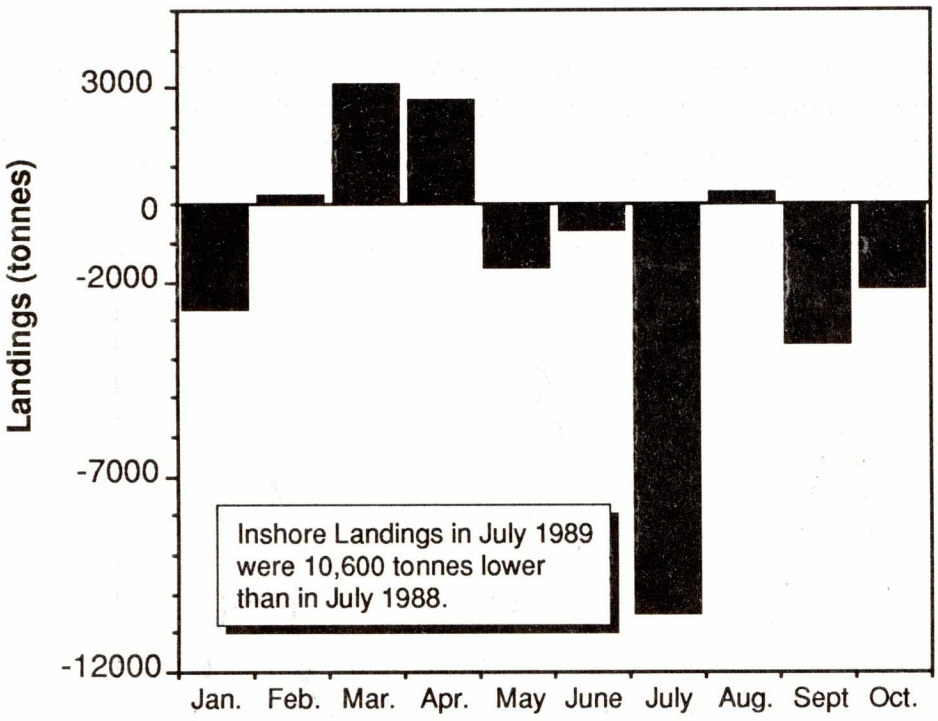

Figure 10: Comparison Between 1988 and 1989 Monthly Groundfish (Cod, Haddock, Pollock) Landings for the under 65 ft. Scotia-Fundy Fleet.

The loss of one month's work would not constitute a crisis in a year-round industry. But many of the 2,000 laid off in July were seasonal workers, for whom this month may have represented 1/4 to 1/2 of their year's work in groundfish processing. The situation was further aggravated by the decrease in demand from the Japanese herring roe market. Extracting roe from herring normally employs hundreds in western Nova Scotia in the late summer months. As a result of both groundfish and herring problems, many people, especially in the processing plants, were unable to get enough work to qualify for unemployment insurance benefits through the winter.

In addition to a number of plants closing because of the shut-down of the inshore dragger fleet, larger plants at Lockeport and Port Mouton closed due to the cumulative effect of years of falling quotas. National Sea Products closed each of its major plants for two months during the year to spread out the impact of a reduced fish supply from both the Scotian Shelf and northern cod.

Primary responsibility for regional development and employment programs lies with other federal departments, not with DFO. Early in the summer of 1989, DFO personnel began consultations with Employment and Immigration Canada (CEIC), the Atlantic Canada Opportunities Agency (ACOA), and other federal agencies to discuss employment issues. CEIC is responsible for such programs as job-retraining and unemployment insurance. ACOA provides assistance to industries seeking to establish in Atlantic communities. DFO and the Task Force provided information and analysis to assist these agencies in adapting their programs to workers who have been adversely affected by changes in the fisheries sector. Nova Scotia and New Brunswick provincial government departments of fisheries, development, and education are also concerned. Municipal governments provide direct social assistance payments to families.

2.5 Summary

The fishery of the Scotia-Fundy Region is of major importance to the regional economy, and especially to the rural areas of Nova Scotia and Southwestern New Brunswick. While the overall contribution to provincial employment may not appear large, many rural communities and small towns and villages depend very heavily on the fishery for their means of livelihood. The total regional employment in fishing and processing groundfish in 1988 was estimated to be around 8,700 full-time-equivalent jobs.

Fisheries management has come to involve much more than conservation and protection of the stocks. Regulation of the fishery has gone through an evolutionary process and now concentrates as much on the economic impact of policies as it does on conservation. As manager of the resource, the federal government must ensure that a sustainable industry exists and that the management system promotes economic efficiency. To achieve this with a minimum of intervention into private business and market forces is a difficult task. With this in mind, the Task Force has endeavoured to propose systems which will minimize intervention and at the same time ensure that the benefits of the fishery are distributed as equitably as possible throughout the various fleet sectors.

The Canadian industry has undergone major expansion since extension of jurisdiction to 200 miles in 1977. Since 1981 the government has tried to control effort and freeze vessel capacity in an attempt to spread the harvest throughout the year and to ensure a share of the resources to all fleet sectors, especially to the small inshore vessels. The effort has not been very successful. The groundfish fishery today suffers from overcapacity and what many see as an inequitable distribution of benefits among user groups. The fishery is also plagued by overfishing and misreporting which threatens the long-term health of the stocks. Criticism of management policies is as severe as it has ever been and the credibility of DFO has been seriously eroded.

At the resource level, there is concern for the three major species, cod, haddock and pollock — especially haddock. This stock has been exploited at two to four times the target level during 1984-88. Scientists warn that if this trend continues the stock may collapse completely. The amount of harvestable haddock is currently the lowest ever recorded. Cod levels are not critically low at this point but there is reason to be concerned. As for pollock, the current exploitation rate of 30% is higher than the recommended optimal rate of 20%, and stock size has dropped between 1984 and 1989.

The catching capacity of the inshore fleet is a question which must be addressed over the short to medium term if a turnaround in the groundfish fishery is to be realized. While the number of vessels has not increased, the fishing power of existing vessels has increased dramatically. The trend toward the replacement of smaller, less powerful vessels with larger ones continues despite efforts to prevent more increases in fishing capacity. Table 5 and Figure 6 above illustrate these increases.

In conclusion, as the 1990's arrive, two major trends are evident - declining stocks and increasing capacity. The Task Force proposes that government and industry focus on these two major problem areas in an attempt to sustain viability in the industry during ups and downs and to ensure that the benefits are maximized and distributed to the best advantage of all who depend on them for their livelihood.

3. TASK FORCE FINDINGS

In the Terms of Reference for this study the Minister of Fisheries and Oceans directed the Task Force to "seek out industry and community views through discussions and meetings with as many interested groups as possible", to pay "particular attention to the work and recommendations of the Scotia-Fundy Capacity Committee" and to keep "an open mind to all other options for management".

In that spirit the Task Force conducted an intensive round of consultations. Some 30 public meetings were held throughout the Scotia-Fundy Region with fishermen and processors and their groups and associations, boards of trade, municipal groups and representatives, provincial governments, and members of Parliament and provincial Legislatures. The map of the Scotia-Fundy Region (Figure 11) and Appendix II indicate the locations of these meetings.

In addition, special meetings were held with the following groups:

- Scotia-Fundy Capacity Committee;
- Scotia-Fundy Groundfish Advisory Committee;
- Eastern Nova Scotia Groundfish Working Group;
- 4X & 5 Groundfish Working Group;

The Task Force convened these sessions in a spirit of openness. Candor was encouraged, as were all ideas and suggestions bearing on the groundfish problem. The Task Force did not attempt to defend the existing management system. The intent was to listen, to seek criticism and to solicit new ideas. This approach elicited many complaints, a few (very few) compliments and some well thought out recommendations. There was some consensus among participants on some issues, but very little surrounding major questions such as the role of fleet sector and gear type interests. Each group had its own solution to the problems it perceived with conservation, stock rebuilding, resource allocation and management in general. Most 'solutions' inevitably involved elimination or curtailment of other fleet sectors or interests or other such negative measures, and/or the transfer of allocations of fish to the group advancing the argument. With few exceptions the short-term, competing self interests of various individuals and groups within the industry dominated discussion.

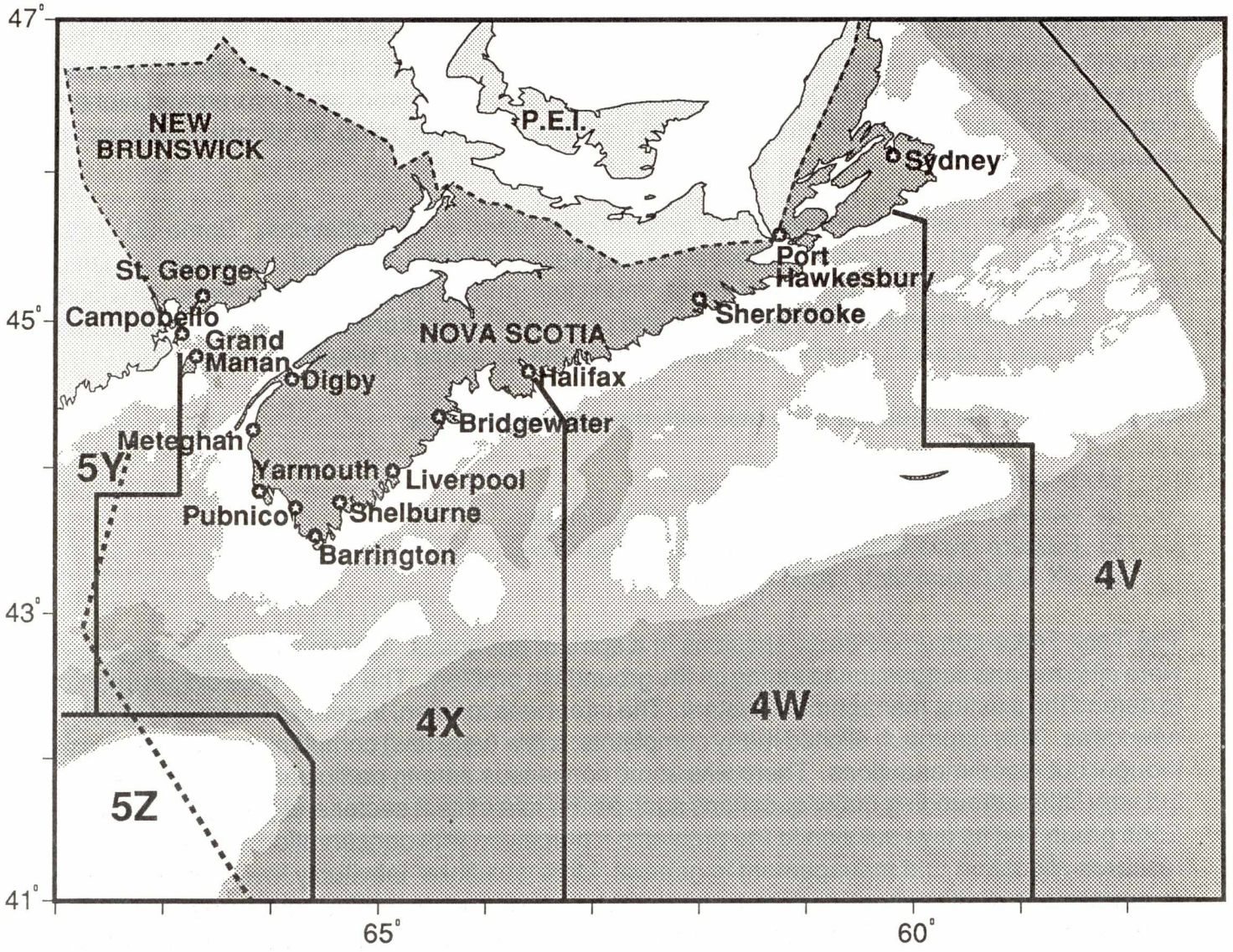

Figure 11: Locations where Task Force held public meetings. Scotia-Fundy Region highlighted.

3.1 Highlights of What the Task Force Heard

This section provides an overview of opinions on some of the major issues raised in the consultation process. It is not an exhaustive list of all issues covered or mentioned during the public sessions. A compendium of issues discussed and opinions received is contained in Appendix III.

Fishermen and others challenged scientists on several counts. They said that **catch statistics** from vessel logbooks were deliberately inaccurate to the point of being worthless. They seriously questioned the methods biologists use in the **stock assessment process**. They criticized fishing surveys on the basis that DFO scientists were "fishing where there is no fish" and were ignoring the extensive expertise of fishermen. They complained about never seeing scientists, and wanted scientists to work more closely with fishermen themselves.

Fishermen had mixed feelings about **stock assessments**. Longline and gillnet fishermen tended to agree that stocks were becoming drastically depleted. Most dragger fishermen, with their higher fishing power, tended to argue that there were lots of fish to be caught, but even some of them showed growing concern over the **scarcity of fish**.

Resource protection was a strong concern. Some fishermen respected the need for **quotas** while others saw quotas as just an aggravation. All showed great interest in letting fish grow bigger. Many suggested **raising size limits**, to give fish more of a chance to grow and to spawn several times before harvest. Many talked of **square mesh nets** which let more fish escape and of **encouraging longlines instead of nets** as a more selective fishing method. Some wanted more **nursery areas** closed to fishing, and many wanted a **culling of the seal population**. On the whole fishermen tended to consider measures such as size limits or a seal cull more useful than quotas.

Fishermen tended to want a system of **enforcement** that was stronger and simpler. They wanted **higher penalties** for offenders, and more extensive use of **licence suspensions and cancellations**. The sentiment among the inshore fishermen seemed to favour a policeman on every offshore vessel.

The **offshore fleet was a target** in general, National Sea Products in particular. National Sea, which is facing similar pressures in Newfoundland, was accused of **misreporting and dumping fish**. The company acknowledged some problems in this area in the past but said they were largely solved. Inshore fishermen also strongly questioned principles of the **inshore/offshore split**: Why should 41 boats get as much fish as 2,700, they asked. Offshore companies countered that each tonne of fish provided to the offshore yields as much employment as a tonne to the inshore.

Some fishermen suggested diverting part of the offshore trawler fleet into **underutilized species**, specifically silver hake.

Even within the so-called inshore sectors, there was a kind of **big boat/small boat split**. Many longliners and gillnetters attacked the 400 **draggers as a destructive fleet**.

In the earlier meetings there was less interest than expected in the question of **overcapacity and a possible fleet reduction**, but overcapacity and **buyback** were discussed with increasing intensity as the hearing schedule progressed.

One of the last representations, from a coalition of several organizations, bore some resemblance to a capacity-reduction scheme worked out in 1988 by an industry/government committee. That scheme called for separating out the 20% of the fleet that takes most of the catch - that is, the specialist boats - and reducing that fleet while leaving the larger, multipurpose fleet alone or putting it on some type of allowance.

Although fishermen and community representatives expressed **great concern about jobs, incomes, and the socioeconomic benefits** which spin out of the industry into communities, there were no proposals for subsidies or bailouts. Fishermen and processors characterized themselves as free enterprisers, and many expressed abhorrence at the idea of further financial subsidies and bailouts which they felt had introduced distortions into the natural course of affairs in the industry in the past. As part of this same entrepreneurial instinct, many fishermen favour the removal of many of the restrictions on their own particular sector, although this does not prevent them from strongly suggesting more stringent restrictions on almost everyone else. Strong representations were received from boat builders who oppose the concept and techniques of restrictions on the size of replacement vessels contained in DFO's new **Vessel Replacement Guidelines**. Fishermen also opposed the Guidelines as they are now structured and applied.

The larger offshore companies were more prepared than the inshore to acknowledge the general malaise stemming from excessive harvesting and processing capacity. One company outlined measures it is undertaking to more closely align fleet and plant operations to availability of raw material (made more predictable as a result of **Enterprise Allocations**) and market conditions. Another proposed several changes to the management system, notably a concept by which excess capacity in the inshore dragger fleet could be redeployed in harvesting some of the offshore quota. The latter suggestion was immediately dismissed by representatives of the inshore dragger fleet. The Province of New Brunswick made a number of comments and suggestions, including: that the diversity of the New Brunswick portion of the Scotia-Fundy fleet be maintained since that is its strength, that the **consultation process** needs improvement, that more effort should be put into **groundfish research**, that the New Brunswick groundfish fleet has not expanded and has no capacity problem, that the **"trimester system"** should be reinstated and that a discussion of **Individual Boat Quotas** be initiated.

The Province of Nova Scotia was highly critical of what it feels is DFO's preoccupation with **quota management**, although they did acknowledge the concept of attempting to match the capacity of the fleet to the amount of resource available for harvest. Nova Scotia supports protection of juvenile fish, maintenance of a year-round fishery and maximization of the return from the resource to the fishing industry. Nova Scotia also suggested a **separate management approach for Georges Bank**.

The Task Force heard that problems exist in the **communication** of fisheries issues to fishermen and the industry and indeed often to DFO staff. Many incorrect perceptions about fisheries management and fisheries science have grown over time and have eroded the overall **credibility of DFO**, thus affecting the underpinnings of the whole management process.

The Task Force has attempted to respond to major and/or frequently mentioned issues raised by the industry in the next section, "Analysis and Recommendations". Obviously, where suggested approaches conflicted, the Task Force could not support both cases, however well-reasoned. While it was not possible to address each and every matter raised, it is hoped that the reader will find that the essentials have been covered.

3.2 Analysis and Recommendations

The Task Force has studied the issues and considered the information and opinions presented to it through consultations. The Task Force has tried to ensure that the recommendations to deal with the existing situation are consistent with a sound long-term strategy for fisheries management. There are of course, limitations to what can be achieved in the short-term. The recommendations are presented under seven headings; Conservation, Commercial Catch Monitoring, Enforcement, Science, Fleet Management, International and Communications.

The Task Force has done what it could to cost out its recommendations. Some of the recommendations can be implemented without additional costs, some can be supported in whole or in part by modifying programs and shifting priorities, some require new or incremental resources which could come through increases in DFO budgets or be cost-recovered from industry.

Some of the recommendations, particularly those related to the **Fisheries Act**, could substantially alter the way in which management tasks such as monitoring and enforcement are now done by shifting more responsibility from government to industry. This makes any costing estimates preliminary.

3.2.1 Conservation

The Task Force's public hearings provided an oppportunity for many groups in the Scotia-Fundy Region to express their concerns about the state of the fishery, and to offer solutions. Stock conservation emerged as a dominant theme. Conservation can take many forms, but the one that concerned most industry people was the protection of spawning and juvenile fish. The Task Force considered regulations involving closed areas, fish size and gillnet usage to address this issue. These measures are offered to protect the resource and thus would be imposed regardless of the fleet management options chosen by fishermen (Section 3.2.5).

Area Closures

Fish congregate at certain periods of their life cycle. A nursery area is where immature or juvenile fish congregate. A spawning area is where mature fish aggregate to spawn. Closure of these areas to fishing at specified times can and has been imposed by DFO as a conservation measure. In 1987, industry was concerned with the capture of large quantities of small haddock in the central Scotian Shelf and proposed a closed nursery area as a practical solution to the problem. An industry/DFO group subsequently defined the management area (A in Figure 12) which has been in effect year-round since that time. Given that the stock appears to be benefiting from this closure, the Task Force considered that this approach be investigated for other groundfish stocks in the Region.

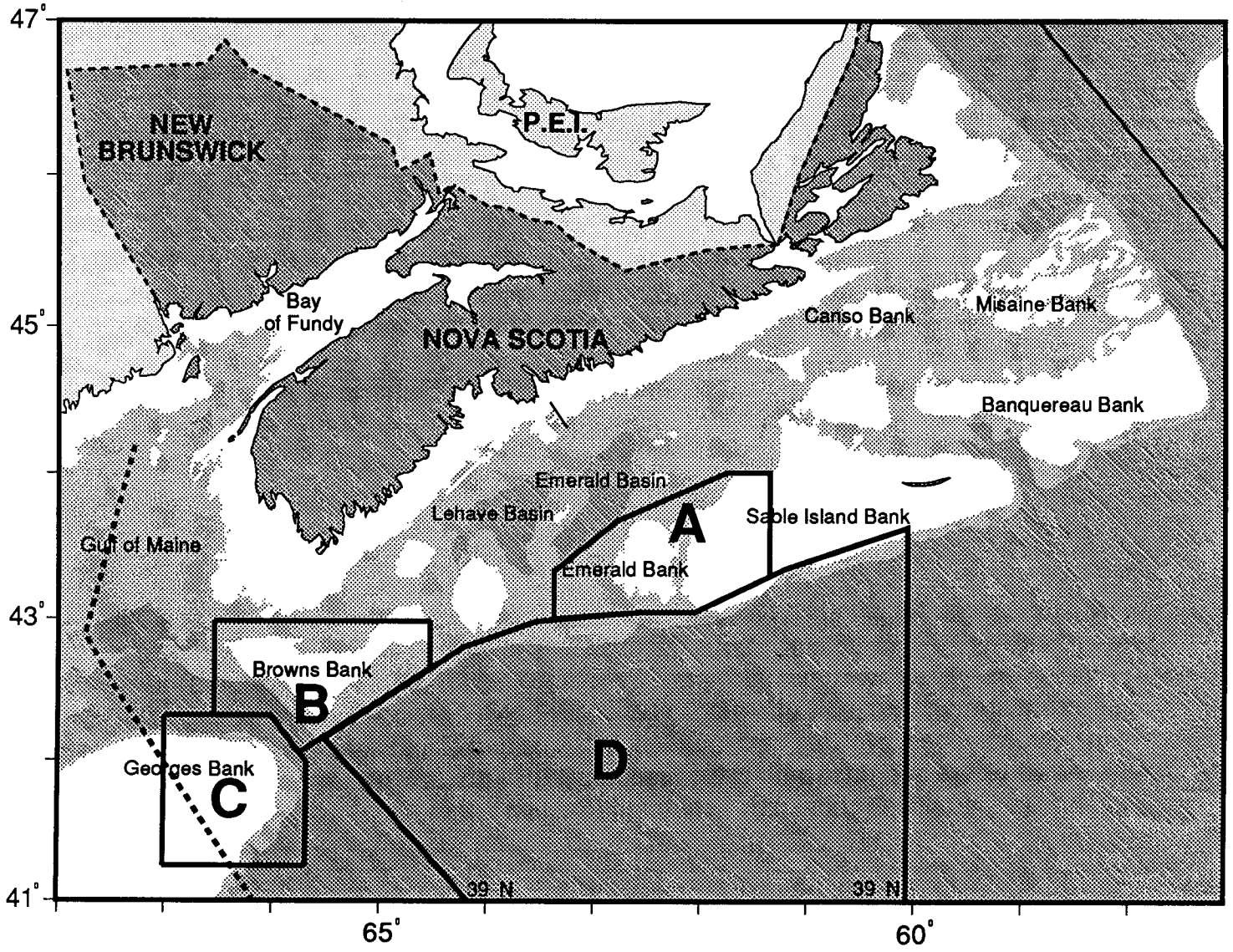

Figure 12: Current Management Areas.

- **A. 4TVW Haddock Nursery Area - closed year round to Mobile gear.**
- **B. 4X Haddock Spawning - closed 1 March - 31 May.**
- **C. 5Z Haddock Spawning Area (Canadian side only) - closed 1 March - 31 May to Mobile Gear.**
- **D. Small Mesh Gear Area used to regulate the harvesting activities of the foreign Silver Hake Fishery.**

The industry was instrumental in the establishment of the spawning closed areas on Browns/ Georges Banks (B and C in Figure 12) in 1970. Fishermen's support for these regulations has stemmed from their belief that these would have direct effects on spawning success. DFO Science has not encouraged belief in such intrinsic benefits, pointing to the difficulties in establishing their impacts. Nevertheless, the measures have been effective at limiting exploitation of the resource and for this reason have been accepted by DFO.

Conservation closures which are imposed on an entire stock are required in extreme situations. The 4X haddock stock requires such protection. Current exploitation, even with the spawning closure on Browns Bank, has reduced the population to the lowest recorded level and continued fishing could eliminate the stock entirely. Urgent action is required.

Recommendation

1. **(a) Extend existing spawning closures on Georges Bank/Browns Bank spawning areas to include the period from March 1 to June 15.**

   (b) Maintain closure of Emerald/Western nursery area to mobile gear year-round.

   (c) In addition to the above spawning closures, for 1990 identify and close to all fishing that portion of Browns Bank necessary to protect the haddock resource.

   (d) Identify additional areas which are critical to stock conservation and growth.

Mesh-Fish/Hook Size

Proposals to increase the regulated minimum landed fish size and to introduce square mesh nets (most trawls now use diamond shaped netting) were frequently raised during the industry consultations. The current 16" minimum fish size was viewed as too low. The Task Force received suggestions that the minimum size be set as high as 19" for cod, haddock and pollock. The intent of these suggestions was the protection of immature cod and haddock, which are generally not more than 17" in length. The industry felt that these fish should be allowed to grow, spawn and contribute to the future fishery. For the depressed haddock resource in particular, increasing the minimum landed fish size above current levels could potentially increase the number of spawners and therefore, contribute to the birth of new year-classes.

To respond to the concerns of industry on this issue, the Task Force examined various trawl mesh sizes and configurations to determine the most appropriate means of reducing the capture of 17" fish. These considerations also took into account impacts on the catch rates and thus incomes to fishermen.

In addressing the minimum fish size issue the problem of controlling discards must be a prominent consideration. There is a need to match the size of the trawl mesh to the minimum fish size to reduce the discarding of undersized fish. The Task Force did not wish to propose regulations that legislate discarding. The capture of some small fish will always occur in mobile gear as nets become filled with fish, and because towing characteristics can alter net configurations.

However, these effects can be minimized by matching the desired fish size to the catching capabilities of the net. Typically, for any given mesh size, the chance of fish getting caught and retained by the trawl (the selectivity) increases as fish size increases. Thus if the selectivity of 17" fish is 5%, the trawl will catch and retain 5 out of every 100 available 17" fish. Put another way, 95 of the 100 fish will be allowed to escape. It is necessary to decide which escapement level is tolerable to both industry and DFO. This will in turn determine the required mesh size to achieve a particular minimum fish size. If a higher minimum fish size is imposed, the mesh size must also be increased to ensure that fish below this size escape.

The 1988 Capacity Committee Report proposed that the minimum size be set at the 25% selectivity level. This would allow 75% escapement of fish below the minimum. The Task Force was concerned with the high rate of discarding that this level may generate and advises that the minimum size be set at the 5% selectivity (95% escapement) level.

Preliminary analysis by the Task Force indicates that the current mesh size of 130 mm mesh allows, on average for cod, haddock and pollock, escapement of only 66% of the under 17" fish. It would be necessary to increase the mesh size to at least 155 mm to allow 95% of 17" fish (an average of 18.5" cod, 15.6" haddock and 17.3" pollock) to escape through the net.

If the minimum fish size is increased above 17", as many fishermen insisted, and at the same time discards are to be kept below 5% (i.e., 95% escapement), then an even more significant increase in mesh size of diamond mesh nets is required. The Task Force was very concerned about this large increase because of possible negative effects on the operating viability of vessels using this gear. Studies done on 155 mm diamond mesh indicate that catch rates could drop by about 30% which would cause vessel operating costs to increase by 15%. This caused a dilemma for the Task Force. Increases in diamond mesh above 155 mm can hardly be justified because of concerns for vessel viability but setting lower mesh sizes would promote more discarding of 17" fish than the 5% target.

There may be an alternative. Studies show that 140 mm square mesh will capture fewer small fish and more large fish than 155 mm diamond mesh gear. Indeed, the 140 mm square mesh achieves 95% escapement of 17" haddock, 20" cod and 19" pollock, (for an average of 18.7") thus meeting the desires of industry noted above. Since 140 mm square mesh fishes comparably to 155 mm diamond mesh, cost increases to the fleet should be about 15%.

While most discussion of mesh size focused on the codend where fish are trapped, experience has shown that unless large mesh is incorporated into the entire trawl the potential for "choking off" the codend is too tempting an alternative. To eliminate this abuse, mesh size regulations must be applied to the entire trawl and not just the codend.

The discussions above focus on mesh size for cod, haddock and pollock. The optimal mesh size for flounder, redfish and other species such as shrimp is smaller. These small mesh fisheries cause bycatch problems but some accommodation is required if the commercial potential of these smaller species is to be realized.

Amendments to the **Atlantic Fishery Regulations** in 1985 eliminated restrictions on the carrying of dual gear (large size and small size mesh) on the same trip. The regulation was considered unnecessary at the time. Unfortunately allowing boats to carry and use varying mesh sizes greatly reduced the ability to enforce the mesh size regulation. Any recommendation on mesh size must take enforceability into account.

The current hook and line fishery captures older (larger) fish than mobile gear. However, the relative selectivity of different hook designs and sizes requires further study. If we are to formally incorporate the targeting of larger fish into the fishing plan it is necessary to assess selectivity of hook type and size.

Recommendations

2. **Introduce a regulation prohibiting possession of fish under 17" at sea and on land. (This may require complementary legislation by the provinces.)**

3. (a) **Introduce a minimum mesh size regulation of 140 mm square mesh throughout the whole net. As an alternative 155 mm diamond mesh may be used.**

   (b) **Eliminate use of 120 mm diamond mesh in St. Mary's Bay when fishing for cod, haddock and pollock.**

   (c) **Provide designated flounder fishermen an exemption which allows for a 120 mm square mesh codend option. (See Recommendation #19)**

4. (a) **Conduct further industry/DFO studies to determine a fish size - hook size relationship such that requirements to discard small fish are minimized.**

   (b) **Identify mesh sizes for fisheries requiring small mesh (e.g. shrimp, redfish) to minimize bycatch.**

5. **Introduce a regulation prohibiting possession of two differing mesh sizes by mobile gear fishermen during any fishing trip unless the vessel has an authorized observer present.**

Gillnets

Many individuals put forth opinions on the use of gillnets. There was no consensus on the implications of these views from a conservation perspective. The Task Force concluded that there was no overwhelming need to eliminate gillnets but that there was a need for improved controls, especially to prevent lost nets from continuing to fish. Even in predominantly gillnet fishing areas there were suggestions made on ways to curb abuses. The Task Force selected those which could be implemented and enforced at reasonable cost.

An "experimental" gillnet program exists in eastern Nova Scotia. In 1989, approximately 70 fishermen operated gillnets under this program in NAFO area 4W. These fishermen also hold longline licences. The Task Force felt that since capacity growth must be capped, the "status quo" for this experimental program cannot be retained and fishermen must select one or the other gear type.

Recommendations

6. (a) **Introduce a regulation requiring all gillnets to be made of biodegradable material to reduce the "ghost-fishing" problem associated with lost gear.**

   (b) **Amend regulations to require continuous tending of gillnets.**

   (c) **Require those fishermen engaged in the eastern Nova Scotia experimental gillnet fishery to choose between longline and gillnet designations.**

3.2.2 Commercial Catch Monitoring

The limitation and allocation of catches is central to the management system applied to groundfish. Total allowable catches (TAC's) are set for each stock and quotas are assigned to fleets, companies, or individuals through annual fishing plans. The catch against each quota has to be accurately reported and recorded to ensure fair implementation of fishing plans and for the long-term protection of stocks. Information on the amount of fish caught is also essential for scientific assessments of stock strength used to set TAC's and quotas for the following year.

The quality of the data provided by the existing monitoring system was condemned during consultations. Fishermen regularly claim to misreport the area of their catch and to under-report their total catches. The Task Force examined the catch monitoring system and has made recommendations to enhance it.

The Legislative Framework

Authority for the present system is drawn from a section of the **Fisheries Act** which was developed before fisheries management became so complex. The current system has been described as the "game warden" approach to catch monitoring. The **Act** has no provisions requiring industry participants (fishermen, buyers or processors) to maintain systematic records of any kind. Fishermen are asked to provide logs; and sales between fishermen and buyers or processors are supposed to be recorded on purchase slips and turned over to the Department. The system places the onus on DFO to continually solicit data essential for management and there is little discipline or rigour in the system. Consequently, log and purchase slip forms are often incomplete. Catch and sale information can be withheld or misreported with relatively low probability of detection. Indeed, few charges have been successfully laid for failure to submit a report, log or slip, and weak penalties have been applied in instances when misreporting has been established. There are no provisions to verify reports or to audit industry records requiring DFO to run an expensive system which is vulnerable to abuse especially in those times when the pressure to exceed quotas is high. The current catch monitoring system is inappropriate as a fundamental management tool for commercial fisheries worth hundreds of millions of dollars upon which so many vital interests depend.

In the past five years much better monitoring systems have been developed for fisheries in other countries and some have already been applied to certain Canadian fisheries. Most Canadian applications still operate on an experimental basis relying in part on industry goodwill, contract law, and/or provincial statutes. The development of a modern monitoring program based on commercial models used in other sectors of the economy, but adapted to the special conditions in the fishery, and supported by appropriate **Fisheries Act** provisions is overdue.

At-sea Monitoring

The monitoring system must address the realities of fishing operations. Special problems are caused by the need to monitor activity at sea where fishermen are required to limit the quantities of fish they take from stocks in specific areas. The motivation to misreport the areas and species fished is high. Commercial fish are discarded in highgrading practices in order to continue fishing higher valued species or sizes of fish. An experiment with multi-species quotas applied to fishing area, 4X and 5 in 1989 offers some promise in dealing with misreporting at sea. It will however require more extensive use of effectively enforced closed areas to protect sensitive stocks within the combined quota.

All foreign vessels fishing within the Canadian Zone and some Canadian offshore vessels which fish several stocks over long trips are required to carry an independent observer. The observer coverage of the domestic fleet may have to be extended. New technology in the form of satellite positioning devices has been developed for tracking vessels at sea. The authority to require the carrying of a "black box" locator could dramatically improve at-sea monitoring effectiveness. Radio reporting of specified activities to monitoring agents on land is now required of some fleet sectors and may have to be extended to others.

Fishing logs containing records of catch from each managed stock have to be maintained on vessels in real time (not more than a few hours old). The exact nature of the data will vary from one fishery to another depending on monitoring requirements.

On-land Monitoring

Fishermen are currently free to offload their catches anywhere they choose or to tranship fish to any other vessel. There are many examples of fishermen using this lack of structure to land illegally caught fish at unpoliced locations in order to avoid reporting. The fish are then trucked to plants or markets. Fish weights can be accurately estimated but estimates become contentious when quotas are tight and large variances develop between the estimates of fishermen and those of DFO monitors. The use of fish storage boxes or other containers may be required to facilitate estimating the weight of fish on board. In any event, formal weigh-outs are required to prove quota violations in court. Proposals to introduce port monitors or independent licensed weighing of fish deserve consideration. Provincial action could be required to introduce such measures.

These realities also suggest the need for some limitation and control over the offloading process. Successful monitoring programs have introduced the concept of designated ports of landing where vessels are required to submit to inspection and weigh-out. The authority to designate ports, wharves and times for landing fish and to prohibit offloading at non-designated wharves or transhipping to other vessels at sea is important in order to control and account for the movement of fish from sea to land. These provisions must be sufficiently flexible to fit the operational circumstances of the fishery while maintaining the efficiency and effectiveness of the monitoring program.

The Task Force considered that the requirement to keep records should be specified through the **Fisheries Act** and regulations. The authority to require reports from these records and to audit them will strengthen the entire monitoring program and management systems. The licence holder or a legally recognized designate should continually be responsible for a vessel engaged in fishing, including all reporting requirements. It may be necessary to specify where records are to be maintained. Fishermen and individuals involved in fish-related businesses also keep records of cost, revenue, and production as a normal business practice. Authority to audit such records to confirm fish catch information is necessary to establish the integrity of the catch monitoring system.

Appropriate documentation should accompany fish through all stages of transport and production. DFO-authorized monitors must be empowered to demand documentation at any stage. Sales made directly to retail outlets or foreign buyers would also need to be accounted for. The **Act** should specifically cover processors and buyers and make clear their obligation to keep records and report. The provinces exercise authority over commerce within their boundries. As a result provincial action may be necessary to complement the federal approach. Authority to audit these records is essential to the effectiveness of the monitoring process.

Timeliness is a necessary feature. Any catch-based management system requires up-to-date information to be accurate. Spot checking by enforcement staff can only be effective if timely information is available. Data documented too long after the events is subject to error and manipulation.

Legislative changes are required to support many of the at-sea and on-land monitoring measures proposed above. Conditions of licence, (see recommendation 12) may provide the most flexible way of dealing with these obligations.

Recommendations

7. **Amend the *Fisheries Act* and regulations to place responsibility on fishermen and fish buyers to keep auditable up-to-date records as required for a comprehensive commercial catch monitoring system and to complete and submit periodic reports on their activities.**

8. **Develop, in accordance with the following schedule, an industry funded Observer Program for EA fleets (greater than 100') fishing on the Scotian Shelf:**

Year	Industry-Funded	Government-Funded	Total Coverage
1990	18%	7%	25%
1991	45%	5%	50%
1992	73%	2%	75%
1993	100%	-	100%

In lieu of observer coverage the development of mutually agreed, industry-funded alternatives which will accomplish "at-sea" monitoring functions can be developed.

9. **Support studies into the development of electronic surveillance techniques for "at sea" monitoring and provide the legal authority to require the use of such devices.**

10. **Modify the Region's catch monitoring program, define the data to be maintained, identify the reports to be submitted, improve dock-side control through the use of designated ports and legal weigh-out sites, and develop the audit and analysis expertise required by the new system.**

3.2.3. Enforcement

The question of enforcement was raised at virtually every meeting in the consultation process. One common theme was the need for fair and equitable treatment for all fishermen. There were many criticisms of current enforcement and several people outlined a need for new directions and expanded efforts.

The existing enforcement capability is heavily burdened. New initiatives or directions in management could add significantly to the enforcement workload. For some of the recommendations made in this report industry cost-sharing is proposed as a way of supporting additional enforcement. In other cases redeployment or incremental resources are required.

Two important approaches for improving enforcement emerged from the consultative process. They both operate on the principle that enforcement can be made more effective and thus less costly by focusing on the consequences of breaking the rules.

Penalties for Violations

Criticism was levelled at the penalty provisions contained within the **Fisheries Act**. The maximum fine of $5,000 for illegal groundfish fishing is looked upon by many in industry as being "a cost of doing business". Penalties must be significant if they are to serve as a deterrent.

The courts are also constrained in the type of penalties they are able to impose. Consideration should be given to providing the court with more alternatives such as restitution, reimbursement of storage costs, probation orders, etc., when sentencing violators for infractions under the **Fisheries Act**.

Recommendation

11. Amend the *Fisheries Act* to increase maximum fines and broaden the range of penalties by providing courts with more flexibility and discretion in order that a more effective deterrence is provided.

Administrative Systems and Licence Suspensions

During the Task Force hearings much discussion took place concerning the suspension or cancellation of fishing licences as an effective deterrent. A fishing licence is a privilege dispensed by the Minister pursuant to Section 7 of the **Act**. Some who appeared suggested that individuals benefiting from this privilege must abide by the rules in order to keep it.

There are two ways to suspend or cancel a licence. A court may do so pursuant to Section 79.1(1) of the **Fisheries Act** after conviction. The Minister may suspend or cancel a licence pursuant to Section 9 of the **Act** if a term of that licence has been breached and no legal proceedings have been commenced against the individual. The Task Force proposes that more use be made of Ministerial suspensions than is currently the case.

A new administrative procedure which respects the principles of natural justice is required for such an approach. For this to occur, infractions which are to be treated administratively should be removed from the regulatory scheme and imposed directly as a condition of licence. Guidelines must be established which define the consequences for violating the conditions. Finally, a formal review and appeal process or tribunal must be set up in order to assure that alleged violators are given a fair hearing before penalties are imposed. Other licensing bodies in Canada employ methods which could help in the structuring of such a system. The administrative approach would not only provide an effective deterrent to violators but it would also relieve an already overburdened court system.

Recommendation

12. **Impose suspensions and cancellations of fishing licences of fishermen who do not observe the terms of such licences. Action required to:**

    (a) **Identify those items which may be imposed as licence conditions.**

    (b) **Develop and publicize licence suspension and cancellation guidelines.**

    (c) **Establish a formal review and appeal process to make recommendations to the Minister.**

3.2.4 Science

Data Quality

Scientists rely on data from two main sources for their assessments: data from the commercial fishery and data from bottom trawl surveys conducted by research vessels. The Task Force was told repeatedly by industry participants that they believed these data were flawed. In the case of commercial data, the accuracy of the information received by DFO was considered questionable due to large-scale misreporting and enforcement problems. In the case of surveys, there was the general belief that research vessels "fish where there is no fish". This led to the often stated desire on the part of fishermen to become more involved in the planning and conduct of these surveys. These perceived problems with data quality undermine science credibility and thus the effectiveness of the management system.

Many of the problems encountered are ones of perception that can be solved through greater attention to communicating the nature of DFO's scientific work. Initiatives to address this are covered later in the report. Some of the problems however, need to be addressed through changes to DFO programs, science or otherwise. Each element of the data quality issue is examined below and recommendations made which will address the problems identified.

(i) Commercial Data

The commercial fishery provides two key types of data used in stock assessments- the total catch extracted from each stock by all vessels, and the catch rate or catch per unit effort achieved by each vessel which serves as an indicator of stock abundance. Both types of information are sought through the existing catch monitoring system. Catch data is compiled for all groundfish vessels through the use of a purchase slip completed at the end of a fishing trip. Catch and effort data is sought from all vessels over 25 gross tons through use of a logbook completed during the fishing trip. The need for improvements in the quality of the data on catch per stock from the entire fleet is addressed by recommendations in Section 3.2.2 . However the proposed changes may not provide scientists with catch and effort information in sufficient detail for calculation of indices of abundance and could still be subject to abuse due to the catch monitoring system's role in quota management.

There has been a longstanding view that special scientific logs should be inaccessible to enforcement staff. These could provide scientists with catch rate data in more detail for a representative sample of vessels than is proposed in the Commercial Catch Monitoring recommendations above. As well, there could be no arguments from industry that this information is unreliable because of enforcement pressures.

The responsibility to collect and process this detailed information on fishing should be delegated to DFO Science with the understanding that any information obtained would not be accessible to enforcement staff. This does not relieve fishermen of the obligation to keep records as specified in the Commercial Catch Monitoring section. Scientists would then be provided with the freedom to design cooperative programs with the industry not only to collect catch rate information but also to allow the use of fishing vessels as research platforms. This will lead not only to long-term improvements in data quality but also to better communication between scientists and fishermen.

Recommendation

13. Support new cooperative initiatives between DFO Science and the fishing fleets to collect more comprehensive information on fish distribution and abundance and ensure that detailed information on harvesting activity collected by Science is not used for enforcement.

(ii) Survey Data

The Task Force noted the critical comments of industry on the design of fish stock surveys and considered that many of these could be resolved through better communication. Further, the general comment that DFO Science should make more use of the expertise of industry is valid.

The poor quality of the commercial catch rate data has forced DFO scientists to rely heavily on survey information to provide trends in resource abundance. The summer groundfish bottom trawl survey has been conducted since 1970 and has become invaluable to the stock assessment process. The Task Force considered that substantive changes to this survey were both unwise and unwarranted.

On the other hand, special surveys for Scotian Shelf cod, haddock and pollock have only recently been initiated by DFO and are in an early stage of their development. The Task Force considered that if reliable information on fish abundance can be obtained from commercial fishing fleets, through recommendation 13, these surveys could more profitably be targeted on the younger, immature fish. Input from the industry would be beneficial in the redesign of these surveys.

A number of industry representatives commented on the potential use of acoustics to provide estimates of stock size. Given the experience with acoustic determination of groundfish both here and elsewhere in the world, it is unlikely that this technology will replace existing survey methodologies, at least in the short term. Its most promising immediate use is in the study of fish behaviour in relation to prey, predators, temperature, tides and so on. It would be more cost effective to immediately improve the quality of the existing surveys through increased use of instrumentation to monitor the behaviour of research trawl gear.

Recommendation

14. In consultation with industry, redirect existing cod, haddock and pollock surveys onto the young and immature age groups. Chartered fishing vessels (see recommendation # 25) may be used to help define the sampling areas for these surveys. In addition, continue efforts to improve survey data quality through the use of acoustics and trawl monitoring instrumentation.

Research

The Task Force's findings on research are considered under four headings. The first relates to the mathematical and computer models that scientists use to measure or **assess** the size of fish populations. The second covers questions on the distribution of the populations, both their stock complexity and seasonal movements. The third considers those biological and environmental processes that influence stock size. The last addresses the research requirements of the new regulatory measures being proposed by the Task Force.

(i) Assessment Models

DFO scientists currently employ a variant of the single species Virtual Population Analysis (VPA) in their stock assessments. The effectiveness of this model has been analyzed in detail at a number of scientific meetings, most recent of these being the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC)'s Statistics, Sampling and Surveys Subcommittee meetings in 1987 and 1988 and the International Council for the Exploration of the Sea Methods Working Group meetings in 1988 and 1989. It has also been examined by the Harris Commission on northern cod. All groups have reported that the Canadian assessment models are sound and with reliable data will produce accurate results.

DFO has established a scientific group in Newfoundland to provide a forum for the study of assessment methods. For instance, the consideration of multispecies interactions has recently gained prominence in Europe. Some of the more fundamental assumptions and conclusions of single species modelling approaches are being challenged. DFO scientists have been following these developments through participation at formal workshops and through ongoing studies. They are thus in a good position to determine how the concepts may or may not apply to this area.

The Task Force considered current efforts of DFO Science regarding stock assessment models to be appropriate and sufficient to address any concerns raised.

(ii) Distribution

A number of issues were raised by industry that pertain to groundfish stock structure and migration. The Task Force noted the recent redefinition of cod, haddock, and pollock management units in the Georges Bank area. The scientific basis for these changes, although appropriate, needs to be discussed with industry. The Task Force also received commments on the relevance of the existing fishing strategy for these transboundary stocks, particularly cod and haddock. DFO scientists are currently undertaking a study to better define the best harvesting approach for Canada. Thus the Task Force concluded that current DFO efforts in this area are adequate.

During the consultations, it became evident that the stock structure of cod, haddock, and pollock in NAFO Division 5Y requires more study as does cod in NAFO Division 4Vn. DFO scientists are aware of these issues and have already planned research programs. The Task Force considered that only encouragement of these efforts was required.

Relatively little effort has been expended by DFO Science on examining the stock composition of each management unit. Little is known about the relationship among the numerous cod spawning areas within NAFO Division 4VW. As well, many fishermen noted that inshore areas have experienced declines in stock abundance not seen in offshore areas. It is unclear whether this has been caused by fishing activity or natural factors. The study of stock distribution becomes all the more important given the emphasis that the Task Force has put on the use of closed areas and seasons to control exploitation. It will be necessary for DFO Science, in consultation with management and industry, to provide the details for these regulatory measures (see recommendation # 1).

It is important for DFO Science to consolidate some of its resources to study the effects of exploitation, predators, prey and environment on fish distribution. Research on this topic will become of increasing relevance as our awareness of the effects of climate change increases.

Recommendation

15. Focus research on the examination of the geographic distribution of cod, haddock and pollock in relation to exploitation,predators, prey and the environment.

(iii) Abundance

Quota projections are currently limited to a two-year horizon due to the inability to predict long-term trends in growth and reproduction. During the Task Force consultations, a number of industry representatives stated their desire for longer-term management plans. This will require a greater understanding of the reasons for long-term fluctuations in the resource. DFO Science has been conducting research on the historical trends in groundfish abundance. This work has indicated that the sizes of populations in various regions of a large geographical area generally increase and decline together. This suggests that large scale environmental factors are at least partially responsible for long-term fluctuations. Unfortunately these studies have been hampered by the lack of information on the historical (pre-1960) abundance of groundfish as well as the absence of a long-term environmental monitoring program in the Scotia-Fundy Region.

The Task Force encourages further efforts to analyze whatever data exists on historical trends in recruitment and growth. However, the lack of a systematic environmental monitoring program will compromise the ability of DFO Science to understand the processes influencing the observed trends and thus to provide catch projections over a longer than two year period.

The Task Force considered that investigation of current environmental data collection processes is required to identify how best these can be enhanced to provide a more comprehensive ocean monitoring program.

Regarding the influence of predators on groundfish abundance, research has focused on silver hake and more recently seals. The silver hake field work is complete with analyses now underway. Progress in the seal program has been hampered by lower than anticipated funding. This is causing delays in analysis and is jeopardizing the relevancy of the research initiative. The Task Force was concerned with this state of affairs given the high level of industry interest in the seal issue.

Recommendations

16. (a) Examine the available biological and environmental information to identify factors responsible for long-term changes in fish growth and reproduction. Where appropriate, enhance existing environmental data collection programs. To the extent that long-term cycles are identified, use this information in quota projections.

(b) Given the importance of the seal issue in terms of gear damage, predation and sealworm infestation, continue to support the industry/government Seal/Sealworm Ecology Program and the Seal Worm Intervention Project by providing the resources it needs.

(iv) Regulatory Measures

Gear-specific effects on fish populations received considerable attention during the Task Force proceedings. Some industry sectors felt that the longline method of fishing was a "conservation-oriented" harvesting approach and should be encouraged through the deregulation of this gear type. Given the high levels of exploitation on the Scotian Shelf, any change in regulatory barriers to the harvesting of one gear sector needs to be carefully evaluated. Although it is known that longline gear catches larger fish on average than other methods of fishing, it is not clear why this is the case and if it will remain so in the future. More study is required before implementing change.

A number of fishermen voiced their concern on the adverse effects of gillnetting and dragging on the habitat. The Task Force is recommending changes to the regulations concerning gillnets to address the issue of ghost-fishing [see recommendation # 6 (a)]. It will be necessary for DFO to put in place programs to not only monitor the impact of these regulatory measures but also to more comprehensively address the whole issue of fishery impacts on habitat.

As the Task Force is recommending a number of changes to the current regulatory system, it is appropriate for DFO Science, in cooperation with the economists, managers and industry to undertake study of the system as just that - a system. A comprehensive and systematic approach to the examination of regulatory problems would provide more insight into the interaction of the biology and management and thus allow rational decision making on the most appropriate mix of options to pursue in the long-term.

Recommendations

17. (a) **Evaluate the biological and economic effects of a longliner allowance fishery including examination of fish selectivity in relation to hook size, type and bait.**

    (b) **Initiate a research program to investigate the effect of fishing activity, particularly that of gillnets and trawls, on the habitat.**

18. **Evaluate the impacts of recommended changes in regulatory measures such as mesh size, fish size, closed areas, etc. to optimize their long-term use in the conservation and management of the resource.**

3.2.5. Fleet Management

Principles

Most of the recommendations made in the Conservation and Enforcement sections have been directed at the control of fishing effort. These are the rules and regulations required to keep fishing fleets from fishing longer or harder than the resource can bear. Nothing has yet been proposed to deal with fishing capacity.

The fishing capacity of a vessel is its ability to exert effective fishing effort on the resource; in other words, its ability to catch fish. Fishing capacity in the Scotia-Fundy groundfish fishery has so far been constrained only by the limitation on licences (there are 2,700) and by limits on the length and hold capacity of replacement vessels. However, since 600 vessels catch 80% of the inshore catch, and since hundreds of licences are not utilized, the number of licences issued appears to be far too high for the limited entry policy to have achieved its purpose.

Vessel replacement rules have also not been effective in limiting fishing capacity. The rules were revised in early 1989 to restrict the "cubic" measure of each vessel (length times breadth times depth). But in a competitive fishery, fishermen will always direct their investment into the unrestricted routes to achieve capacity growth. For example, when length was controlled, breadth and depth increased dramatically; now with cubic capacity restricted, other means such as bigger engines and gear will be used to increase fishing power.

Even if stocks are well managed through effort controls, there is a persistent tendency for fleets to develop too much harvesting capacity. This occurs in fisheries where fishermen compete with one another to catch fish from a common stock, with or without an overall quota on the catch. The theory behind this natural development has been explained in many articles and reports over the past three decades, and need not be repeated here. There are several potential solutions to the overcapacity tendencies:

(i) Ignore the problem. Take action to protect the stock, and allow the fleet to rise and fall in cycles. The tendency is for capacity to "ratchet" higher when times are good, and to ease back only slightly when times are not so good. When other fisheries such as lobster or scallop are lucrative, earnings from these fisheries may also be invested in more groundfish fishing capacity. Eventually, excess fishing capacity reaches extreme levels, a downturn in earnings occurs, and a massive crisis is recognized. Competitive fisheries do not easily adjust to changing economic conditions.

(ii) Competitive fishing with capacity control. This rarely works well. Great resistance is encountered whenever any attempt is made to limit vessel capacity. The rules can never cover all the potential areas for capacity growth. Fishing power can be enhanced by bigger engines, bigger holds, broader decks, more or better gear, overnight crew quarters, larger fuel tanks, fish-finders, navigational aids, and so on. Furthermore, these measures to limit capacity are of little use when serious overcapacity already exists.

(iii) Individual quotas. The industry will behave the same way as other industries. A fisherman would be allocated to a certain percentage of the catch, and there would be no point in buying a vessel capable of catching much more than that. Each fisherman would decide for himself what his capacity should be for the quota he holds. However, unless there is some means for fishermen to share vessels or combine or exchange quota, the adjustment process could take up to the 20 year life of vessels. If the catch limits can truly be enforced, this is a very effective way to maintain balance between fishing capacity and the resource.

(iv) Industry-funded licence retirement. Organize fleets into groups which can share both costs and benefits of periodic retirement of licences. Whenever the fleet expands to the point where the licence holders want to reduce their numbers, they can chip in to compensate anyone who will voluntarily retire his licence. The group would want assurance that no new licences would be granted to fish from this quota. This is perhaps the simplest option for capacity reduction, but it may be difficult to take the first steps. A fund-raising mechanism is required. There is no reason for government funding of such a program, as those who pay will benefit from an increased share of the catch.

(v) Government-funded licence retirement. This works in the same way as an industry funded program, except that it uses taxpayers' money to pay fishermen to retire their licences. Since those who stay in the fishery will receive most of the benefits, this solution is not attractive to taxpayers.

(vi) Taxation. This is a tax or royalty on catch or effort. It would work to limit growth in capacity if it were set high enough to reduce fishermen's incomes to the level where they could not benefit from further investment in fishing capacity.

At the present time, in the Scotia-Fundy inshore groundfish fishery, the crisis described in point i) above has apparently arrived. We have not had adequate capacity controls, nor individual quotas, nor a licence retirement mechanism to defuse the capacity growth. Now an adjustment is sorely needed and a system must be put in place to permit **continuing** adjustment to prevent such a degree of overcapacity from occurring again.

Inshore-Offshore Issues

For many who appeared before the Task Force, an adjustment in the inshore-offshore allocations of groundfish was the first priority. In spite of the major review of this issue in 1988, the Task Force gave further serious thought to changing the shares of the Total Allowable Catch (TAC). Consideration was given to job loss or creation, to community impacts, to economic efficiency in fishing and, finally, to DFO's ability to enter new long-term management commitments with the whole industry while continually revising past agreements. The conclusion was that no net benefits to Canadians nor to the Scotia-Fundy fishing/processing community as a whole would result from another transfer of fish from the offshore to the inshore. Furthermore, the Task Force concluded that the Enterprise Allocation (EA) schemes for vessels over 65' were working well as a means to allow licence holders to manage the fishing capacity of their fleets. Future development should be focused on improving catch monitoring and on relaxing rules such as those which prevent using inshore vessels to fish offshore EAs.

Management of Inshore Fleets

A number of alternative management schemes were considered in the broadest possible context - from the elimination of quota management to individual boat quotas. The conclusions presented below were based on the Task Force's perception that there were three identifiable groups of fishermen whose problems needed to be addressed in different ways.

Recommendation

19. Restructure inshore groundfish fleets into three groups, each with its own approach to management, reflecting its distinct characteristics.

Fishermen will have some choice in the selection of a group. For many, however, their choice will be obvious. The recommended groups are defined as follows:

Group A

A large proportion of all groundfish licences are issued for vessels engaged in the inshore mixed fishery. Groundfish is used to supplement fishing for lobster, scallops, herring, mackerel and other species. This is a labour intensive low cost groundfish fishery which can yield a decent living for many fishermen while consuming relatively little of the groundfish TAC. In the mixed fishery, groundfish is available as an alternative to other species and, significantly, as an alternative to unemployment.

In the interests of encouraging a flexible inshore fishery, large scale cancellations or other immediate reductions of numbers in this group are not advised. A separate section below discusses inactive licences. However, to discourage a build-up of fishing power in this category, a fixed catch limit per trip is proposed, in the order of 1,500 kg of groundfish. This may vary from year to year with stock conditions, but it will not increase by a large factor.

As a further discouragement to building vessels primarily for the groundfish fishery, Group A vessels will be permitted to fish groundfish only for a limited season (eg. six months) which will vary by area to be consistent with local conditions.

Group A is to be restricted to fixed gear vessels (longline, gillnet). Vessels in Group A will not be required to surrender any non-groundfish licences to remain in the group. The catch will be managed by means of effort controls (the trip limit and seasons), not a quota. This recognizes what has been in place effectively for years, that fixed gear vessels can fish at a rate of 1,500 kg per trip without being subject to closure of the fishery. No transfers of uncaught portions of this allocation will be permitted.

This Group A program comes with some risks. It was mentioned earlier that a competitive fishery leads naturally to overcapacity. A fixed maximum trip limit is only a partial control on output - vessels may be designed to catch the limit quickly and make many trips. And the number of licenced vessels in this category will be in the hundreds. If, for example, the lobster fishery turns down from the very high landings of recent years, much more effort could be directed to groundfish. This program will therefore be watched very carefully for a three-year trial period to evaluate its performance. If DFO's ability to monitor catches by small vessels improves over that period, other options may be open - for example, weekly catch limits.

Group B

The Task Force concluded that the overcapacity problems in the inshore fixed gear sectors are less critical at this time than in the mobile gear fleets. Group B, then, consists primarily of fixed gear vessels, who are specialists in the sense that they traditionally make larger trips. These vessels are not necessarily exempted from capacity remedies over the long-term, but no fleet management changes are contemplated at the present time.

Group B vessels will fish as at present in a competitive fleet quota, subject to seasonal quotas and to trip limits as necessary. When the quotas allocated have been caught, no 1,500 kg trip limit will apply. The fishery will simply close. These vessels will be allowed to retain licences for other species.

The only exception to the rule restricting vessels to fixed gear, will be the inclusion in the Group of mobile gear vessels under 45 ft. in length who may fish for flounder with a 10% bycatch of cod, haddock or pollock. These small draggers may opt for Group B or C, but not both.

Group C

Group C consists of the vessels which the Task Force has concluded represent the most critical overcapacity problem in the inshore fleet. The 1989 closure of mobile gear fishing in western Scotia-Fundy, after a season that lasted only six months despite trip limits and short closure periods, makes the conclusion inescapable.

Entry to Group C will be limited to vessels under 65 feet long with mobile gear licences. These fishermen will be given as much freedom as possible to choose a course of action which will lead to a solution to their overcapacity problem. The Task Force can see no justification for taking fish from another fleet sector to help postpone a resolution of overcapacity in this fleet. Removing quotas altogether from the inshore would have the same effect - the most powerful vessels would displace the others. Competition for fish encourages more overcapacity. A fundamental change in incentives is required.

The Task Force's suggestion for achieving a solution in Group C is as follows. Groundfish licence holders under 45 ft. with mobile gear designations on their licence may choose to be in Group B or C. In Group B they may fish mobile gear for flounders, as described above, but may only use fixed gear for other groundfish species. In C they may fish either longline or mobile gear or both, but all catch comes from the same Group C quota. Mobile gear licences for vessels 45 to 65 feet in length have only the C option to fish either gear type from the same quota.

Vessels in Group C, for at least 1990, will continue to fish competitively with season and trip limits, within a mobile fleet quota. When required legislation, administrative arrangements and monitoring systems are in place, Group C licence holders will jointly choose whether to move to:

(i) individual vessel quotas with pooling or partnership provisions;

(ii) individual transferable quotas;

(iii) an ongoing arrangement for self-funded retirement of licences;

(iv) a competitive quota system as at present;

(v) other options acceptable to the industry and DFO.

The licence retirement could easily precede either of the other choices, or be pursued in conjunction with them. Choice iv) will require new monitoring and enforcement measures similar to i) and ii). These measures will include more responsibility on the part of fishermen and buyers to report catches, and possible restriction of landing ports. (see Section 3.2.2)

These proposals do not require Group C vessels to give up any non-groundfish licences they may hold, so that some may continue to fish scallops or lobster. While many fishermen without these licences consider this policy to be unfair, it is simply a continuation of past policies and does not aggravate the groundfish situation.

Since fleet shares of the TAC will be fixed, clearly the fewer vessels in a group, the larger the share per vessel. As the Group C share of the TAC will not be reduced if the fleet is reduced, it must be recognized that those who gain from a fleet reduction process should also pay for it. There are means of negotiating licence retirements which are fair to all parties.

To support the management scheme for Group C, individual members of this group would be charged higher annual fees in the thousands of dollars. These funds could be used to initiate or administer self-funded licence retirement schemes as developed by the group and agreed to by DFO. They might also offset the substantial catch monitoring and enforcement costs associated with an IQ or ITQ program. Such fees appear high, but it must be remembered that the Crown is providing an exclusive annual allocation of large quantities of a public resource. Extensive consultations and in all likelihood, a substantial industry/DFO management and administrative infrastructure would be necessary were the group to decide to adopt some individual quota or licence retirement scheme.

Inactive Groundfish Licenses

There are hundreds of licenced vessels for which DFO catch statistics show no recorded landings in most years. The number of such licences for 1988 for the whole Region is around 1,200. Some of these will have been active on a small scale, their catch records not having been properly linked to the vessel.

The enormous collective fishing potential of inactive vessels warrants some limitation on fishing capacity. Two thousand small fixed gear vessels, if they could catch 1500 kg daily for 50 days, would have 150,000 tonnes of groundfish - the entire Regional cod-haddock-pollock quotas. This potential has not been anywhere near fully utilized in the past, and a sudden change in activity is not expected. However, the Task Force is seeking a means to phase out inactive licences so as to minimize hardship to those holding the licences.

Recommendation

20. Define and identify inactive licences. Assign them to Group A and make them *non-transferable*. Establish an appeal process to assist in correct identification of unused licences.

First Steps to Implementation

It is not possible to assess with any accuracy which fishermen, nor how many, are likely to opt for the Group A program. It is proposed that every active licenced fisherman vote more than once for his preference. During 1990, up to three votes will be conducted to determine fishermen's choices of Group A, B or C. Only the final ballot will be binding.

In the initial ballot, licence holders will be given some basic ground rules such as the 1,500 kg trip limit and gear restrictions (fixed or mobile) within groups. Tentative fleet allocations will be worked out as well. Fishermen will choose their preference, but **without any commitment** on the first ballot. The numbers will then be reassessed and, if changes are necessary in quotas, trip limits, seasons, or other rules of the game, these will be delivered back to the fishermen for a second vote.

When the picture has stabilized sufficiently to allow rational choices by fishermen, a final ballot will be carried out. The last choice will be a commitment on the part of each licence holder. Those choosing B or C options may in the future join the A Group. Those choosing A initially cannot later move up to the higher capacity B or C levels. Similarly, vessels choosing C can later move to B, but B vessels cannot move up to C even if they hold mobile gear licences. These rules apply to licences, not to individuals. Present policies concerning ownership or transfer of licences will be respected where they do not conflict with the new policies.

While the group selection process is taking place during 1990, work will proceed as rapidly as possible to design and create a framework to support both industry funded licence retirements and individual vessel quotas. This will necessitate the study and development of legislative and regulatory measures, monitoring and control mechanisms, surveillance and enforcement, administrative structures, etc. **Only if and when** such systems are in place, can Group C move into a more flexible management scheme allowing capacity adjustment. Much more work is required on the part of the Department to explain capacity management options to Group C licence holders, and to design schemes suitable to their circumstances.

Recommendation

21. Develop the administrative systems necessary to support the new groundfish fleet structure, including legislative and regulatory changes.

Handliners

No limited entry licence is currently required for individuals to fish groundfish for commercial or private use by means of handlines. The quantity of fish landed annually by several hundred handliners is in the order of 6,000 to 8,000 tonnes, which is included in fixed gear quotas and catches. This has sometimes been a means to avoid quota closures.

Recommendation

22. Establish a control mechanism for persons fishing handlines either through a licensing or a regulatory scheme.

Vessel Replacement Policy

As long as there is an incentive for fishermen to expand fishing capacity, rules will be needed to try to control this capacity. Regulations restricting only vessel length have been ineffective, as the "jumbo" vessels have shown. The 110% limitation on hold capacity proved unenforceable. Hence an effective and enforceable limitation on vessel size is necessary. The revised replacement policy introduced in early 1989 has created problems due to basic differences in design between old and new vessels, and due to the inflexibility of fibreglass moulds for vessels.

It may be possible someday to eliminate the need for vessel replacement rules relating to the groundfish licence for vessels in Group A. This would be dependent upon the permanent trip limit being proven an effective and enforceable control on catch. It will obviously take a few years of observation before the size restrictions on vessels can safely be lifted from this group. Similarly, if Group C moves to individual vessel quotas, and if these are well controlled, there may be no need for vessel replacement rules in future.

Recommendation

23. Maintain the policy of no capacity increase upon replacement of a vessel or transfer of a licence. An industry/DFO committee should address the problems in the implementation of the 1989 Vessel Replacement Guidelines.

Underutilized Species

The Task Force does not anticipate rapid development of Canadian fishing effort on underutilized species such as silver hake, mackerel, argentines, dogfish or others. Canadians have first priority in allocation of quotas for these stocks but little private sector interest has been expressed in fishing, processing, and marketing these species. Marketing is usually the most formidable hurdle to overcome. The USSR and Cuba fish the large silver hake resource because for those countries, it is not necessary to sell the fish at a profit. Canadian companies have experimented to some degree with silver hake and other underutilized species. But in spite of plant closures and vessel tieups, they have seen no potential for profitable fishing of these species.

Any barriers to development of these resources should be carefully examined. The ban on catching fish for fishmeal for example may not always make sense. Severe limits on bycatch of traditional species may be restricting development of fisheries of potentially greater value.

Marketing fish is not within the mandate of DFO nor should it be. This can only effectively be done by an entrepreneur with a product for sale. Government assistance may be helpful in providing technical or scientific advice. Joint ventures with foreigners may, in certain instances, lead to development of some fisheries.

There is a risk in some cases that government support of the development of underutilized species may harm any fledgling private operations that may be developing. There may be market niches that exist for small quantities of product (eg. dogfish). If large quantities are produced and sold at low prices, the small yet profitable market may disappear.

In spite of some cautionary notes against too-high expectations, the size of the underutilized resources is enormous, and no opportunities to develop them should be missed.

Recommendation

24. Continue to encourage and support the development of underutilized fish resources, including possible federal/provincial financial assistance.

Chartering Fishing Vessels

During the consultations, industry representatives suggested that DFO did not listen to their advice and concerns, particularly in the areas of scientific surveys of groundfish stocks and at-sea enforcement of regulations. The lack of credibility for DFO's scientific effort has been partly the result of a lack of industry participation in the process. While DFO groundfish scientists have had some specific programs with significant industry input, such as recent pollock and silver hake surveys, there has been no large scale integration of the efforts of DFO and industry in either scientific or enforcement activities.

The Task Force proposes that this problem can be remedied in part by chartering fishing vessels and crews for perhaps five years at a time to perform both scientific and enforcement work for the Department.

Recommendation

25. Contract a number of licenced high capacity inshore mobile gear vessels to augment DFO science and enforcement activities.

This program would hopefully be tied into a licence retirement scheme. The licences of these chartered vessels could be "banked" for the duration of the charter, and then retired. This could be a satisfactory way to ease out of the fishery for a number of individuals.

The use of draggers on a long term contract in return for licence retirement would provide a major increase in at-sea capability and would over time reduce capacity. The benefits to be gained from improved science and enforcement capability, as well as the improved industry/DFO interaction should go a long way toward improving relations. This, in a small way, would be a step towards increased industry responsibility in fishery management and at the same time towards improved DFO capability in areas where industry clearly feels improvements are essential.

Fleet Structure Summary

Inshore (Vessels under 65 feet)

Group A

- ❑ Fixed gear fishing only
- ❑ Retain all licenses
- ❑ Small trip limit (e.g. 1500 kg)
- ❑ 6 month season
- ❑ 3 year trial program

GROUP B

- ❑ Fixed gear (except option for mobile gear to fish flounder with 10% bycatch of cod, haddock and pollock)
- ❑ Retain all licences
- ❑ Competitive fleet quota
- ❑ Quota is fixed % of TAC
- ❑ Trip limits/trimester quotas
- ❑ Total closure when quota reached (no 1500 kg)
- ❑ 3 year trial program

Group C

- ❑ Must have mobile licence
- ❑ Retain all licences
- ❑ Competitive fleet quota in 1990
- ❑ Quota is fixed % of TAC
- ❑ Trip limits in 1990
- ❑ Trimester quotas in 1990
- ❑ Fleet choices beyond 1990
  - individual quota
  - individual transferable quota
  - self-funded licence retirement
  - other options
- ❑ Entry fees required ($ thousands)
- ❑ 3 year trial program

Midshore (65-100 feet)

- ❑ Existing enterprise allocation approach
- ❑ Increased observer coverage required (some industry funding)

Offshore (over 100 feet)

- ❑ Existing enterprise allocation approach
- ❑ By 1993 achieve full observer coverage, 100% industry funded.
  or
  Industry/Government agreement on alternative means for at-sea and in-plant monitoring

3.2.6. International

Georges Bank/Gulf of Maine

Canadian and American approaches to fisheries management differ significantly. The U.S. approach focuses entirely on protecting fish before they reach harvestable size through measures such as mesh and fish size controls and closed areas. There are no limits on amounts harvested, total effort, licensing or capacity. The Canadian approach, while also regulating fish size and mesh size, limits total catch through quota management. In addition, Canada seeks to manage fleets through licensing and capacity controls. Each country pursues strategies without regard for the impact of each others actions.

The result is not very satisfactory either to orderly harvesting or stock conservation. Indeed, CAFSAC noted in Advisory Document 89/12, that cod catches on Georges Bank (5Z) since 1978 have resulted in fishing mortalities two or three times the target. CAFSAC also noted that a reduction in catches and effort by Canada may not result in substantial long-term increases in yield to the Canadian fishery as any benefit of such reductions may be negated by increased effort by the U.S. in response to increased catch rates. Division 5Y is another transboundary area of stocks which stretches from Grand Manan and Campobello Island to the coastal areas of the New England States.

The need for a joint Canada/U.S. approach to fishing these areas must be addressed. It may be possible for each country to pursue different management measures which may nevertheless be equivalent for the purposes of stock conservation.

The issue of enforcement of the U.S./Canada boundary was raised by many fishermen. Canada has significantly increased penalties for foreign fishing in its waters which now greatly exceed those applicable in the United States. Consequently, American vessels observed fishing illegally in Canadian waters quickly retreat to the U.S. side where penalties are low. The Task Force feels that the time has come for both countries to discuss a resolution to this issue. Discussions might focus on such concepts as reciprocal legislation, joint enforcement schemes as well as equivalent deterrents through identical penalties.

It was made clear to the Task Force that the industry does not want Canada to place the question of U.S. access to the Canadian zone on the table.

Recommendation

26. Pursue discussions with the U.S. to develop compatible fishing approaches on Georges Bank including measures to ensure compliance. Reciprocal access is not to be considered.

Foreign Fishing

The Task Force noted a perception among the public that foreign fishing in Scotia-Fundy waters is extensive and may be largely responsible for the decline in traditional groundfish stocks. In fact, the only foreign fishery in the Scotia-Fundy Region which has an impact on traditional groundfish stocks is the silver hake fishery conducted off the Scotian Shelf in a restricted area (Figure 12), mostly by the USSR and Cuba. Vessels are subjected to 100% observer coverage at their expense. Silver hake is not exploited by the Scotia-Fundy fleet and is surplus to Canadian requirements.

There is a bycatch associated with this fishery, and while low on a percentage basis' the total of cod, haddock and pollock landed is in excess of 3,000 t (250 t of cod, 720 t of haddock and 2,370 t of pollock in 1989). The industry expressed concern that these bycatches were being harvested by foreigners without any benefit to Canadians, especially at a time when the domestic groundfish fishery is shut down early due to quota restrictions and plants are closed due to a lack of these valuable traditional species.

Recommendation

27. Open discussions at the next Canada/USSR and Canada/Cuba bilateral meetings with respect to landing the cod, haddock and pollock bycatch at Canadian plants.

3.2.7. Communications

The current advisory process used by DFO is elaborate. Several hundred members participate on 37 committees covering all of the major species. Three major committees exist for groundfish. The approach aims to open up a dialogue with fishermen in order to obtain their views and give them an active role in management. This structure has opened up good communications with the individuals who serve on the committees. Members have become knowledgeable in the field of fisheries management and have developed a better understanding of the scientific issues. Despite this success, however, it is the view of the Task Force that the process has failed in two fundamental ways.

First, the consultative process, despite its elaborate structure, has not succeeded in getting the message out to the majority of fishermen. Most fishermen have not been given information on how their fishery is managed and the role that the consultative process plays in that management. As a result fishermen are often not informed on the fundamentals of fishing plans and the principles which underlie them.

The Task Force has concluded that a special effort is required in order to disseminate sound, factual information. While DFO has expended considerable energy and resources in developing the consultative process, and in improving media relations, it appears insufficient effort has been made to get information to fishermen. Specific initiatives are required on that issue.

Consultations indicated a low level of credibility in science, most of which was due to a number of misconceptions existing at a grass roots level. This has occurred in spite of routine involvement of scientists in the groundfish advisory committee process. The scientific information disseminated through committees is not getting distributed to the industry rank and file. Thus there is a need for more effective science communication. The current Fisheries Information Seminar (FINS) held by scientific staff of DFO is an example of an initiative which aims to address this problem.

At some meetings it was noted that provincial governments also have a responsibility. It was suggested that provincial education departments establish programs aimed at improving fisheries and environmental awareness at a community level.

The **second** problem that surfaced was that some members of Advisory Committees do not represent significant numbers of fishermen and often do not have any mandate or instructions to make commitments on behalf of the fishermen they do represent. Too often, Advisory Committee members express their own views and are quick to point out that they do not wish to be seen speaking for other fishermen. This, of course, strikes at the very principle of representative systems and erodes the consultative process.

The Task Force concluded that fishermen continue to be poorly organized. Poor organization is a root cause of poor representation. Improved organization is unlikely to happen without some sort of outside assistance - be it legislative, administrative, financial or all three. Action on the part of provincial governments may be required.

The Task Force also considered the role of the news media in the fisheries management process. The media have become very active in reporting on the fishery over the past few years and now provide information to fishermen and the general public. Reporters have developed an impressive level of understanding with respect to the major issues in spite of a policy which excludes them from Advisory Committee meetings. The Task Force sees no practical justification to exclude the media from the consultative process. There may be individual topics which are particularly sensitive and require private discussions within a committee. In such a case a request for a private session could be made to the Chairman of the committee.

The major objections to the presence of the press appear to be twofold - it will intimidate members and stifle discussion and it will provoke "grandstanding". The Task Force has found through discussions with Advisory Committee chairmen and through personal experience (the Task Force hearings were open) that it does no such thing. In fact, discussion remains frank and open and the "grandstanding" is no worse than it usually is. In fact it is minor when compared to that which takes place before the cameras and microphones **after** the meetings. Group dynamics appear to take care of both of these tendencies. The presence of reporters would allow them to hear the "give and take" and to be in a better position to assess, analyse and report on the issues.

There is a need for more industry input into the existing CAFSAC process. The Task Force noted that the closed door policy of CAFSAC was negatively perceived by industry and DFO managers alike. Although CAFSAC espouses very legitimate reasons for the policy, it does not remove the misconceptions. As a first step to "demystifying" CAFSAC, the Task Force considered that a more structured means for industry input into the assessment process is required.

Recommendations

28. **Improve communications with fishermen, through the continuation and expansion of efforts such as seminars, media publications, and information dissemination. Provincial departments of education should develop programs which focus on the fishery.**

29. **Begin consultations with fishermen and federal and provincial officials to develop options for effective representation of fishermen, including consideration of such items as:**
    - **legislatively based fishermen's associations**
    - **alternative electoral processes**
    - **licence levy schemes to raise funding for fishermen's organizations.**

30. **Open all Advisory Committee meetings to the public and the press.**

31. **Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC) develop a policy to allow for industry input.**

4. CONCLUDING REMARKS

The Task Force has spent many hours and days deliberating on the issues of the groundfish fishery in the Scotia-Fundy Region. A great deal of thought has gone into each and every recommendation. Literally hundreds of people have contributed to its conclusions and recommendations. The true test however, lies in the future. Will the thrusts proposed in this report make a difference in the future of the management and success of the groundfish fishery on the Scotian Shelf, Georges Bank and the Bay of Fundy? The Task Force believes that implementation of its recommendations would signal a new era with industry taking more responsibility for its own affairs, supported in the achievement of its potential by a less paternalistic and more responsive DFO.

The main theme which the Task Force has tried to develop in this study is the concept of **choice**. It has sought to offer the fullest range of alternatives to the industry in order to assist it to address its problems and achieve its potential. The Task Force has as much as possible tried to avoid the approach of imposing solutions and of forcing the industry to adopt one particular course of action. Clearly, most of the choices are tough ones that require sacrifices and modifications in the way fishermen, the industry and indeed DFO conduct their affairs. However, flexibility and sacrifice are necessary ingredients to change, and if there was a common thread throughout this whole process it was that people wanted a change - a change for the better.

It is not only fishermen and the industry who face tough choices in the groundfish fishery. **Tough choices** will also be required of legislators and funding authorities. The report asks that individuals in these roles carefully evaluate the implications of alternatives which could lead the industry in entirely different directions.

There is for example, the **choice** of whether to place much more responsibility for catch monitoring on the industry. This implies passing legislation requiring industry to maintain records and report data as a matter of statutory responsibility - a concept which applies in many Canadian industries where equivalent data is provided by business to regulatory authorities. There is the **choice** of whether to impose stiffer penalties, including licence suspensions, in an attempt to achieve higher deterrence, or on the other hand, to select lower penalities and fund more expensive levels of enforcement. Studies indicate that higher penalties are extremely effective in limiting enforcement costs. There is the **choice** of whether to fund programs at taxpayers expense or through cost recovery from beneficiaries. Some say cost recovery is quite justifiable for a program which provides benefits to an identifiable group. Finally, there is the **choice** of whether to divert funds from other DFO programs to groundfish management. Identification of the program priorities and clients upon whom reduction would be imposed is difficult. None of the above choices are easy. They require the consideration and balancing of a number of factors.

Regardless of the source of funding, implementation of the above recommendations will not come without costs. The budget of DFO's Scotia-Fundy Region has generally remained constant at about $115 million for about three years. A breakdown indicates that $38.7 million (34%) is spent on harvest management for commercial fisheries (see Appendix VIII, Table 1). Regional fisheries harvest management costs can be further assigned to major commercial fisheries. The cost of managing the groundfish fishery was $12 million or 31% of the harvest management total (see Appendix VIII, Table 2). This $12 million is about 2.6% of the approximate $456 million processed value of groundfish produced in the Scotia-Fundy Region. It compares favorably with the expenditures of regulatory authorities in other sectors of the Canadian economy.

Many of the very basic questions raised in this section: stronger legislation, industry/DFO roles, higher penalties, cost recovery and additional federal funding - **the big choices upon which so much depends** - are beyond the purview of the Task Force. Yet they are fundamental to new approaches to management of the groundfish fishery in the region.

Given uncertainty arising from choices provided in the suggested approaches, it is difficult to develop detailed cost estimates related to implementation plans. Nonetheless the Task Force feels responsible to provide the best indication of the resource requirements of its recommendations possible at this time. As background, it is important to bear in mind that as part of overall government restraint, DFO operations have been reduced to all but essential elements of core programs.

Cost estimates for the Conservation, Enforcement and Commercial Catch Monitoring recommendations arise from additional requirements such as extended or new closed areas and new infrastructure for data collection and statistical systems. Similarly, due to constraints scientific efforts have tended to focus on core programs associated with the major commercial species of cod, haddock and pollock. New programs are now being recommended and funds will have to be found for implementation. In ranking Science recommendations, longer-term results had to be traded off against those immediately required to implement overall recommendations. Communications were identified as a high priority investment which will hopefully lower management costs and produce better understanding and rapport with the industry. Expanded production and/or distribution of reference material, explanations of the stock assessment process, brochures, minutes of Advisory Committees, etc., all require funding.

The Task Force has not provided a detailed breakdown of costs in this report, but preliminary analysis indicates that, with the exception of enforcement, something in the order of $1 million and 25 to 30 people would be required to implement the recommendations. Depending on the choice of alternatives as discussed above, the sea and air surveillance required to enforce the recommendations could be very costly and run into several millions of dollars.

In Conclusion . . .

The Task Force has tried to develop a framework to provide fishermen and the industry with the flexibility to select solutions best suited to their needs. Now is the time for improved understanding and cooperation. Good choices can lead to a good future for the Scotia-Fundy groundfish fishery.

Appendix I TERMS OF REFERENCE

Minister of
Fisheries and Oceans

Ministre des
Pêches et des Océans

July 18, 1989

Mr. Jean Haché
Regional Director General
Scotia-Fundy Region
Fisheries and Oceans
P.O. Box 550
Halifax, Nova Scotia
B3J 2S7

Dear Jean:

The purpose of this letter is to set out my instructions to you concerning the Task Force on the Scotia-Fundy groundfish fishery that I have asked you to lead.

I am also writing today to the Honourable Donald McInnes, Minister of Fisheries for Nova Scotia, and to the Honourable Denis Losier, Minister of Fisheries and Aquaculture for New Brunswick, to express my views regarding the state of the groundfish fishery and to inform them of my instructions that you develop an action plan on an urgent basis.

I am asking you to work closely with the Task Force of federal government officials on Northern Cod and to prepare a report for my consideration and presentation to the Special Committee of Cabinet.

In your consultations and deliberations, I ask you to take into account the interest of all fleet and gear sectors, including the 2,300 fixed-gear vessels still fishing groundfish, the 400 draggers who have exhausted most of their 1989 quotas, the offshore sector, the shore workers, and the fishing communities in general. Throughout this process, please make sure that relevant information on the state of the groundfish stocks and fleets is made available to all licensed groundfish vessel owners, as well as to all of those affected by this issue. You must make sure that all concerned understand, among other things, the basic facts of over-capacity and stock decline, as well as my fundamental responsibility to conserve the resource. I ask you to seek out industry and community views through discussions and meetings with as many interested groups as possible. Your Task Force must pay particular attention to the work and recommendations of the Scotia-Fundy Capacity Committee and work as closely as possible with that Committee. But you must also keep an open mind on all other options for management.

The Action Plan that you will develop must aim at establishing long-term stability and prosperity in the groundfish fishery of the Scotia-Fundy Region.

I ask that your Action Plan provide me with recommendations to address the following issues:

1. The adequacy of existing scientific advice on the Scotian Shelf, Georges Bank, and the Bay of Fundy fishery including an assessment of the effect of future different harvest levels on stock recovery schedules.

2. The basic management principles of the Scotia-Fundy groundfish fishery including assessments of:

   - the impact of present harvesting plans on the resource and the impact of fleet sector and gear sector interactions;
   - the effectiveness of effort and conservation controls such as quotas, fish size, closures of spawning/nursery areas, mesh size, gear selection, etc;
   - the existing fleets, especially as they relate to capacity.

3. The Economic impact of alternative fishery management approaches on individuals and companies involved in the fishing industry and on the communities which are dependent on the fishing industry including:

   - the impact of a reduction of harvesting capacity;
   - the effect on employment levels, income and the viability of vessel and plant operations;
   - a review of alternative economic opportunities and programs which may be available to assist in any period of adjustment.

The Task Force will develop alternative approaches to fisheries development including the promotion of conservation oriented technologies and the exploitation of underutilized species.

As indicated in my press release of last week, I will be meeting wih you and the members of the Capacity Committee later in the summer to discuss your various ideas and proposals.

I offer you my best wishes in this most important task.

Yours sincerely,

Tom Siddon, P.C., M.P.

Appendix II SCHEDULE OF CONSULTATIONS

Tuesday, July 18	-	special meeting with Capacity Advisory Committee
Wednesday, July 19	-	special meeting with Scotia-Fundy Groundfish Advisory Committee
Thursday, July 27	-	Sydney, N.S.
Friday, July 28	-	Halifax, N.S.
Monday, July 31	-	Sydney, N.S.
Tuesday, August 1	-	Port Hawkesbury, N.S.
Wednesday, August 2	-	Sherbrooke, N.S.
Thursday, August 3	-	Digby, N.S.
Tuesday, August 15	-	Meteghan, N.S.
	-	Yarmouth, N.S.
Wednesday, August 16	-	Pubnico, N.S.
	-	Barrington, N.S.
Thursday, August 17	-	Shelburne, N.S.
	-	White Point Beach, N.S.
Friday, August 18	-	Bridgewater, N.S.
	-	Halifax, N.S.
Thursday August 24	-	Grand Manan Island, N.B.
	-	Campobello Island, N.B.
Friday, August 25	-	St. George, N.B.
Wednesday, August 30	-	Halifax, N.S.
Thursday, August 31	-	Halifax, N.S.

Appendix III ISSUES RAISED IN TASK FORCE CONSULTATIONS

This Appendix is a compendium of issues raised during the more than thirty meetings held by the Task Force. The list follows the seven category format of the report and includes as well an "Other Issues" category. The numbers in brackets indicate the **number of meetings** at which the issue was raised.

Conservation

Introduce square mesh to allow smaller fish to escape undamaged (19)
Extend existing and identify new spawning/nursery area closures (17)
Mandatory gutting and icing of fish at sea (14)
Increase fish size to 19" or 20" (11)
Increase mesh size (8)
Eliminate the carrying of two different sizes or types of gear (8)
Protect juvenile fish (6)
Retain gillnet fishing on South Shore (5)
Control gillnet fishing - ghost-fishing, tending, logs, etc. (4)
Close Browns Bank year-round (3)
Eliminate experimental gillnets in Eastern Nova Scotia (ENS) (3)
"Zero" enforcement tolerance on minimum fish size (2)
Landed weight to encourage gutting (2)
Fish out of the water less than 45 hours need not be gutted. (1)

Commercial Catch Monitoring

Stock assessments incorrect as they are based on inaccurate data reported by fishermen (16)
Catch is deliberately misreported by fishermen (14)
DFO statistical data is inaccurate and outdated (9)
Management system is not credible because it is based on false data (7)
New statistical system required (5)
Regulations required to control unloading, reporting, designate ports, etc. (4)
Science data should not be used in enforcement (3)
Focus data collection at plant level (1)

Enforcement

Reduce misreporting and discarding (9)
New, simple, strong enforcement (9)
Use licence suspension powers more often (7)
Weekly trip limits (7)
Increase penalties (5)
Increase level and effectiveness of penalties (5)
Enforce fairly, equitably, equally (3)
Use observers on all fleets (increase coverage level) (3)
Fixed gear to have exclusive halibut fishery (2)
Prosecute plants who assist in misreporting landings (2)

Better controls on gillnets (2)
Make better use of enforcement data (2)
Monthly quotas (1)
Maintain effort controls (1)
Fund new electronic enforcement initiatives (1)
Extend Canada/U.S. line to Grand Manan (1)
Eliminate 12 mile dragger exemption (1)
Extend jurisdiction to Nose and Tail of Grand Banks (1)
Prevent export of unprocessed groundfish from province (1)
Extend Hague Line (1)
Need speedy legislative changes to control situation (1)
Need ministerial courage (1)
Allow industry to regulate fishery (1)
Provide fixed gear and mobile gear fishing zones (1)
An industry penalty administration board needed (1)

Science

Stock assessments are incorrect (12)
No science credibility (6)
Logs are poor (6)
Use commercial draggers in stock assessment process (6)
Design programs and restrictions considering environmental aspects (6)
Rebuild stocks (5)
More fish needed (4)
Science data should not be used for enforcement (3)
Science not understood (3)
Stocks are not in bad shape (2)
Surveys incorrect (2)
Conduct an index fishing program to sample effort (2)
Eliminate $F_{0.1}$ for NAFO Subarea 5 (2)
Permit industry input to CAFSAC (1)
Develop multi-species modeling to understand inter-relationships (1)
Provide program to train teachers in support of school programs on fisheries (1)
Analyse hook size selectivity (1)
Multi-species modeling (1)
Provide more dollars to science (1)
Conduct research into predator/prey relationship (1)
Systematic surveys of pre and partial recruitment ages (1)
Assess acoustic and thermographic survey methods (1)
Design acoustic, thermographic and surveys on pre and partial recruits (1)
Better record collection and retrieval (1)
Establish longer term TAC's (1)

Fleet Management

Introduce Individual Quotas (15)
No Individual Transferable Quotas (ITQs) (8)
Move offshore to underutilized species (8)
Eliminate cubic number control of vessel capacity (7)
Introduce allowance for fixed gear (7)
Remove factory freezer trawler from traditional groundfish harvest (6)
No Individual Quotas (IQs) (6)
5' intervals and fish hold capacity controls (5)
Change shares inshore/offshore (4)
Eliminate quotas (4)
Maintain seasonal trimester system (4)
Transfer 5000t 4VsW cod to inshore (3)
Take quota from mobile gear (3)
Do not introduce a buyback (3)
Introduce federally funded buyback (3)
Do not reduce number of vessels (3)
Buyback mobile gear only (3)
Reduce number of vessels (3)
Introduce restrictions on other fleets fishing in ENS waters (3)
No more transfers from offshore (2)
Manage groups separately (2)
Process all landed fish in Canada (2)
Offshore refuse to pay observer costs (2)
No subsidies or bailouts for offshore (2)
Capacity question must include offshore (2)
Choose one licence designation per year (2)
Limit length and fish hold of vessels (2)
Must consider fisherman safety in Vessel Replacement Guidelines (2)
Much more flexibility needed in replacement guidelines (2)
Cost-share a buyback (2)
"Freedom to 45'" (2)
Promote generalist/specialist designations as in Capacity Report (2)
Modify inshore/offshore to pre-Kirby (2)
Review mobile gear limits (2)
Need new plan (2)
Establish market consortium/port market (2)
Fishermen to choose gear type for 1 year period (2)
Give all cod, haddock and pollock to inshore (offshore on underutilized, flounder, redfish) (2)
Consider harvesting redfish and flatfish using a 70% cod, haddock, pollock bycatch (1)
Assign Enterprise Allocations (EAs) to plant (1)
Introduce moratorium on increases in processing plants (1)
Offshore to go into silver hake (1)
Promote alternate species i.e. tuna for inshore (1)
Compensate fleets and plants for capacity reduction (1)
Adjust fleet by providing government assistance (1)

There is no overcapacity (1)
Put a moratorium on inactive licences (1)
Offshore will **only** share equally in downturn (1)
Adopt capacity report and leave offshore alone (1)
Eliminate the combined management of cod, haddock and pollock stocks (1)
Introduce multiple licensing of fishermen (1)

International Issues

Enforce and control foreign activity (6)
Eliminate foreign activity (6)
Canada/U.S. bilateral discussions and fishing plans (5)
Replace foreign fishing with offshore boats (2)
Manage Georges Bank as a separate entity (2)

Communications

More flexibility needed - be better listeners (4)
Fisherman/government solutions needed (4)
Grass roots fishermen need to be consulted (3)
More community consultations needed (2)
More public information needed (2)
Promote mandatory financing of representative fishermen's associations (2)
Analyse and consider social issues (2)
Encourage fishermen to work with DFO (1)
Do not take action without consensus (1)
Curb ministerial interference (1)
Need a more representative, balanced decision making process (1)
Need a permanent fishermen's forum (1)
Decide by consensus (1)

Other Issues

Criticisms of Task Force

Short notice of meetings, schedule and limited locations (5)
Should be an independant study and not all DFO people (2)
Task Force tied too closely to capacity committee (1)

Stability

Needed in science (8)
Needed overall (6)
Improve scheduling (2)
Multi-year quota (2)
Fairer quota (1)
Constant trip limit for generalists (1)
Annual quota (1)

Aquaculture

- Encourage offshore (4)
- New uses (meal) and markets (2)
- Improve aquaculture output (1)

Economic Issues

- Increase value added content (1)
- Analyse market considerations (1)
- Maximize landed value (1)
- Market promotion and enhancement (1)
- Improve financial viability (1)

Seals

- Controlled cull (9)
- World wide public relations campaign needed (1)
- Contraceptive needed (1)
- Reintroduce bounty (1)
- Need workshop (1)

Underutilized Species

- Subsidize development of underutilized species (3)
- Subsidize fishing and processing (3)
- Land foreign bycatch (1)

Appendix IV LIST OF RECOMMENDATIONS

3.2.1 Conservation

1. (a) Extend existing spawning closures on Georges Bank/Browns Bank spawning areas to include the period from March 1 to June 15.

   (b) Maintain closure of Emerald/Western nursery area to mobile gear year-round.

   (c) In addition to the above spawning closures, for 1990 identify and close to all fishing that portion of Browns Bank necessary to protect the haddock resource.

   (d) Identify additional areas which are critical to stock conservation and growth.

2. Introduce a regulation prohibiting possession of fish under 17" at sea and on land. (This may require complementary legislation by the provinces.)

3. (a) Introduce a minimum mesh size regulation of 140 mm square mesh throughout the whole net. As an alternative 155 mm diamond mesh may be used.

   (b) Eliminate use of 120 mm diamond mesh in St. Mary's Bay when fishing for cod, haddock and pollock.

   (c) Provide designated flounder fishermen an exemption which allows for a 120 mm square mesh codend option. (See Recommendation #19)

4. (a) Conduct further industry/DFO studies to determine a fish size - hook size relationship such that requirements to discard small fish are minimized.

   (b) Identify mesh sizes for fisheries requiring small mesh (e.g. shrimp, redfish) to minimize bycatch.

5. Introduce a regulation prohibiting possession of two differing mesh sizes by mobile gear fishermen during any fishing trip unless the vessel has an authorized observer present.

6. (a) Introduce a regulation requiring all gillnets to be made of biodegradable material to reduce the "ghost-fishing" problem associated with lost gear.

   (b) Amend regulations to require continuous tending of gillnets.

   (c) Require those fishermen engaged in the eastern Nova Scotia experimental gillnet fishery to choose between longline and gillnet designations.

3.2.2 Commercial Catch Monitoring

7. Amend the **Fisheries Act** and regulations to place responsibility on fishermen and fish buyers to keep auditable up-to-date records as required for a comprehensive commercial catch monitoring system and to complete and submit periodic reports on their activities.

8. Develop, in accordance with the following schedule, an industry funded Observer Program for EA fleets (greater than 100') fishing on the Scotian Shelf:

Year	Industry-Funded	Government-Funded	Total Coverage
1990	18%	7%	25%
1991	45%	5%	50%
1992	73%	2%	75%
1993	100%	-	100%

In lieu of observer coverage the development of mutually agreed, industry funded alternatives which will accomplish "at-sea" monitoring functions can be developed.

9. Support studies into the development of electronic surveillance techniques for "at-sea" monitoring and provide the legal authority to require the use of such devices.

10. Modify the Region's catch monitoring program, define the data to be maintained, identify the reports to be submitted, improve dock-side control through the use of designated ports and legal weigh-out sites, and develop the audit and analysis expertise required by the new system.

3.2.3 Enforcement

11. Amend the **Fisheries Act** to increase maximum fines and broaden the range of penalties by providing courts with more flexibility and discretion in order that a more effective deterrence is provided.

12. Impose suspensions and cancellations of fishing licences of fishermen who do not observe the terms of such licences. Action required to:

(a) Identify those items which may be imposed as licence conditions.

(b) Develop and publicize licence suspension and cancellation guidelines.

(c) Establish a formal review and appeal process to make recommendations to the Minister.

3.2.4 Science

13. Support new cooperative initiatives between DFO Science and the fishing fleets to collect more comprehensive information on fish distribution and abundance and ensure that detailed information on harvesting activity collected by Science is not used for enforcement.

14. In consultation with industry, redirect existing cod, haddock and pollock surveys onto the young and immature age groups. Chartered fishing vessels (see recommendation # 25) may be used to help define the sampling areas for these surveys. In addition, continue efforts to improve survey data quality through the use of acoustics and trawl monitoring instrumentation.

15. Focus research on the examination of the geographic distribution of cod, haddock and pollock in relation to exploitation, predators, prey and the environment.

16. (a) Examine the available biological and environmental information to identify factors responsible for long-term changes in fish growth and reproduction. Where appropriate, enhance existing environmental data collection programs. To the extent that long-term cycles are identified, use this information in quota projections.

(b) Given the importance of the seal issue in terms of gear damage, predation and sealworm infestation, continue to support the industry/government Seal/Sealworm Ecology Program and the Seal Worm Intervention Project by providing the resources it needs.

17. (a) Evaluate the biological and economic effects of a longliner allowance fishery including examination of fish selectivity in relation to hook size, type and bait.

(b) Initiate a research program to investigate the effect of fishing activity, particularly that of gillnets and trawls, on the habitat.

18. Evaluate the impacts of recommended changes in regulatory measures such as mesh size, fish size, closed areas, etc. to optimize their long-term use in the conservation and management of the resource.

3.2.5 Fleet Management

19. Restructure inshore groundfish fleets into three groups, each with its own approach to management, reflecting its distinct characteristics.

20. Define and identify inactive licences. Assign them to Group A and make them **non-transferable**. Establish an appeal process to assist in correct identification of unused licences.

21. Develop the administrative systems necessary to support the new groundfish fleet structure, including legislative and regulatory changes.

22. Establish a control mechanism for persons fishing handlines either through a licensing or a regulatory scheme.

23. Maintain the policy of no capacity increase upon replacement of a vessel or transfer of a licence. An industry/DFO committee should address the problems in the implementation of the 1989 Vessel Replacement Guidelines.

24. Continue to encourage and support the development of underutilized fish resources, including possible federal/provincial financial assistance.

25. Contract a number of licensed high capacity inshore mobile gear vessels to augment DFO science and enforcement activities.

3.2.6 International Issues

26. Pursue discussions with the U.S. to develop compatible fishing approaches on Georges Bank including measures to ensure compliance. Reciprocal access is not to be considered.

27. Open discussions at the next Canada/USSR and Canada/Cuba bilateral meetings with respect to landing the cod, haddock and pollock bycatch at Canadian plants.

3.2.7 Communications

28. Improve communications with fishermen, through the continuation and expansion of efforts such as seminars, media publications, and information dissemination. Provincial departments of education should develop programs which focus on the fishery.

29. Begin consultations with fishermen and federal and provincial officials to develop options for effective representation of fishermen, including consideration of such items as:
    - legislatively based fishermen's associations
    - alternative electoral processes
    - licence levy schemes to raise funding for fishermen's organizations.

30. Open all Advisory Committee meetings to the public and the press.

31. Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC) develop a policy to allow for industry input.

Appendix V List of Written Submissions to the Task Force

The Task Force received some sixty written submissions which were drawn upon in analysis and the preparation of recommendations. These submissions contained a wide variety of opinions and suggestions, some of which may not be included in Appendix III. The submissions have been bound and may be viewed at the DFO libraries.

Eric Allaby, MLA, Charlotte Fundy, Legislative Assembly of New Brunswick

Keith Amero, Bay of Fundy Fishermen's Association, Digby, Nova Scotia

Michael Belliveau, Maritime Fishermen's Union

John H. Boudreau, Isle Madame Fishermen's Group, Petit De Grat, Nova Scotia

Kingsley Brown, Fishing Masters Association, Antigonish, Nova Scotia

Steve Bursey, Secretary, Inshore Fisheries Concerned Citizens Alliance, Wood's Harbour, Nova Scotia

Coline Campbell, M.P., South West Nova

Casey Fisheries Ltd., Digby, Nova Scotia

Clearwater Fine Foods Inc., Bedford, Nova Scotia

James Conrad, President, Argyle Sea Products Ltd., Glenwood, N.S.

Albert Conrod, Eastern Passage, Nova Scotia

Murray Coolican, Vice-President, National Sea Products Limited, Halifax, Nova Scotia

Adlai Cunningham, President, Sea Star Seafoods, Clark's Harbour, Nova Scotia

Capt. Claude Darrach, M.B.E., Halifax County, Nova Scotia

Anthony Davis, Sociology and Anthropology, St. Francis Xavier University, Antigonish, Nova Scotia

Digby County Community Futures, Digby, Nova Scotia

J.P. Doucet, Clerk-Treasurer, Municipality of Argyle, Tusket, Nova Scotia

Seldon Doyle, Elected Member, Eastern Shore Lobster Advisory Committee, Head Jeddore, Nova Scotia

Don Dunbar, Manager, Royal Bank of Canada, Sherbrooke, Nova Scotia

Eastern Fishermen's Federation

Sam Elsworth, President, Sambro Fisheries Limited, Halifax County, Nova Scotia

Russell Finck, Blandford, Nova Scotia

Fisheries Information Services, Halifax, Nova Scotia

J. Fralic & Sons Fisheries Ltd., Queens County, Nova Scotia

Gary Goreham, M. & M. Fisheries Ltd., Wood's Harbour, Nova Scotia

Grand Manan Fishermen's Association, Grand Manan, New Brunswick

Inshore Alliance

Independent Seafood Processors Association of Nova Scotia, Yarmouth, Nova Scotia

Howard Johnston, Manager, Islandfresh Seafood Inc., Digby, Nova Scotia

Robert A. Kellough, Toronto, Ontario

John G. Leefe, Minister, Department of the Environment, Nova Scotia

Leroy J. Legere, MLA, Yarmouth, Nova Scotia

Bradley Longmire, President, Little River Seafood Packers Ltd. Digby, Nova Scotia

Walter MacAlpine, Warden, Municipality of the District of Digby, Nova Scotia

D.A. MacLean, Deputy Minister, Department of Fisheries, Nova Scotia

Ervin Marshall, President, Annapolis Valley Affiliated Boards of Trade

Peter L. McCreath, M.P., South Shore, Bridgewater, Nova Scotia

Jean Melanson, Warden, Municipality of the District of Clare

Alan M. Merritt, Municipal Clerk Treasurer, Chairman, Shelburne County Opportunities Association, Shelburne County, Nova Scotia

Robert E. Myles, Hunts Point, Nova Scotia

Bruce Newell, General Manager, R.E. Newell Fisheries Ltd., Voglers Cove, Nova Scotia

Elmer D. Nickerson, Warden, Municipality of the District of Shelburne, Nova Scotia

T.A. Nickerson, North West Harbour, Nova Scotia

Nova Scotia Dragger Fishermen's Association

The Nova Scotia Federation of Labour, Halifax, Nova Scotia

Cecil O'Donnell, Warden of the Municipality of Barrington, Nova Scotia

Keith Pendleton, Deer Island, New Brunswick

Colin Smith, West Head C.S.I., Nova Scotia

Elnathan D. Smith, R.I. Smith Co. Limited, Shag Harbour, Nova Scotia

Noble Smith, South West Nova Longline Association, Newellton, Nova Scotia

Arthur Theriault, Vice-President Finance, A.F. Theriault & Son Ltd.Meteghan River, Nova Scotia

Charles J. Thibodeau, Digby, Nova Scotia

Christopher Tidd, Little River, Digby, Nova Scotia

Linda Vidito, Vice-President, Canadian Seafood and Allied Workers, Digby, Nova Scotia

Glenn A. Wadman, Manager, Fundyfresh Seafoods Inc., Digby, Nova Scotia

Appendix VI Glossary

Biodegradable	Material that when lost or discarded has a relatively high decomposition rate.
Biomass	The abundance, in tonnes, of a stock. Also known as stock size.
Black box	An electronic transmitter placed on a fishing vessel to identify its location and movement.
Bycatch	The unintentional catch of one species when the target is another.
Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC)	A DFO organization with the mandate to review the stock assessments of east coast scientists and provide advice on the management of the fisheries within Canadian jurisdiction.
Catch monitoring	Activities required to record the quantities of fish being caught and landed by the fishery.
Catch rate	Volume of fish caught per amount of fishing effort expended.
Discarding	The intentional dumping of unwanted fish at sea.
Dragger	Fishing vessel less than 100' in length which catches fish with a trawl.
Effort controls	Regulatory measures used to limit the use of fishing effort.
Enterprise Allocation (EA)	Quota allocated to an enterprise (company).
Exploitation	The harvesting of fish.
Fishing capacity	The ability of a fishing vessel or fleet to catch fish.
Fishing effort	Fishing activity measured in units of time (hours, days).
Fixed gear	Fishing equipment which catches fish passively, i.e., longlines, traps and gillnets.
Fleet sector	A group of fishing vessels with common characteristics.
Flounder	Collective term used to describe the flatfish species of groundfish. i.e., plaice, sole, winter flounder, yellowtail, etc.

Full and part-time fishermen	Full-time fishermen are individuals who normally fish all or most of the season available to them in their localities. Those who fish for shorter periods are referred to as part-time fishermen.
Gillnet	A long retangular net, usually anchored near the ocean bottom, which catches fish by entanglement or snaring at the gills. If the net becomes separated from its surface buoy it can continue to 'fish' indefinitely without being retrieved. This is called 'ghost-fishing'.
Ghost-fishing	See Gillnet.
Groundfish	Collective term used to describe species that feed near the ocean bottom. The principal species include cod, haddock, redfish, pollock and flounder.
Handlining	A method of fishing by hook and line held in the hand of a fisherman.
Highgrading	The discarding of lower valued fish in preference for higher valued fish.
Individual Quota (IQ)	Quantity of fish allocated on an annual basis to either a vessel or person.
Individual Transferable Quota (ITQ)	Individual quota which can be transferred to others in the fishery.
Inshore	Fleet sector consisting mostly of independently owned vessels under 100' in length, supplying small independently owned processing plants.
Juvenile	Fish too young to spawn.
Longline	A line of baited hooks, anchored to the ocean bottom and retrieved at intervals by a vessel called a longliner.
Mobile gear	Fishing equipment towed behind a vessel in active pursuit of fish (see trawl).
NAFO Divisions	Fishing zones off Canada's east coast established by NAFO and identified by alpha-numeric codes (see Fig. 1).
Northern cod	Popular term for the cod population found from the northern half of the Grand Banks to the Hamilton Inlet Bank off Labrador (NAFO Divisions 2J, 3KL).

Northwest Atlantic Fisheries Organization (NAFO)	An international organization responsible for providing management advice on fisheries of interest to Canada and member states.
Offshore	Fleet sector consisting of vessels greater than 100' in length and usually owned by vertically-integrated companies with large processing plants.
Overfishing	Harvesting activity by fishing fleets which catches quantities of fish in excess of the TAC.
Population	Synonymous with stock.
Quotas	Quantities of fish allocated to various fleets, the sum of which equals the TAC.
Recruitment	The entry into the stock of young fish which have grown to a harvestable size.
Stock assessment	The scientific activity conducted to determine the size and potential yield of a fish stock.
Stock	A group of fish of the same species which live and reproduce within a defined geographical area and generally do not mix with those in other areas.
Survey	Fishing for research purposes to determine characteristics of fish populations.
Tonne (t)	Metric ton. One thousand kilograms (2204 lbs). The standard unit of volume in fisheries statistics. It is abbreviated as t.
Total Allowable Catch (TAC)	For each distinct stock of fish, an annual determination of a total maximum permitted catch level.
Trawl	A bag-like fishing net which captures fish by being towed behind the vessel along the ocean bottom.
Trip limit	Amount of fish permitted to be caught during one trip.
Underutilized Species	Species of known or unknown quantities which have the potential to be more fully exploited on a commercial and marketable basis by Canadian fishing enterprises.

Appendix VII ABBREVATIONS

ACOA	Atlantic Canada Opportunities Agency
CAFSAC	Canadian Atlantic Fisheries Scientific Advisory Committee
CEIC	Canadian Employment and Immigration Commission
DFO	Department of Fisheries and Oceans
EA	Enterprise Allocation
FINS	Fisheries Information Seminar
GRT	Gross Registered Tons
IQ	Individual Quota
ITQ	Individual Transferable Quota
NAFO	Northwest Atlantic Fisheries Organization
t	Tonne (metric)
TAC	Total Allowable Catch

Appendix VIII FUNDING BY PROGRAM ACTIVITY AND FISHERY

Table 1
Scotia-Fundy Region
1987-88 Fiscal Year Expenditures
Highlighting Fisheries Harvest Management Costs

	($ Millions)			
	OPERATIONS	OVERHEAD	TOTAL	(%)
FISHERIES HARVEST MANAGEMENT	33.9	4.8	38.7	34
Habitat Management	1.0	0.3	2.2	2
Inspection	4.9	0.7	5.6	5
Special Services to Fishing Industry	7.5	1.0	8.5	7
Service to Aquaculture	6.9	1.0	7.9	7
Small Craft Harbours	14.4	2.0	16.4	14
Hydrographics	9.8	1.4	11.2	10
Oceanographics	18.7	2.7	21.4	19
Service to Other DFO Regions	1.9	0.3	2.2	2
Service to Other Departments	0.2	-	0.2	-
TOTAL REGIONAL EXPENDITURES	100.1	14.2	114.3	100

Table 2
Scotia-Fundy Region
Fisheries Harvest Mnaagement
Expenditures By Major Species & Management Activity
1987-88 Fiscal Year

	$ Millions					
	Research		Resource	Surveillance &		% by
	Biological	Economic	Management	Enforcement	TOTAL	Species
GROUNDFISH	5.3	0.5	1.4	4.8	12.0	31
Lobster	2.4	0.3	1.0	4.8	8.5	22
Scallop	1.1	0.3	0.6	1.5	3.5	9
Herring	2.7	0.1	0.6	0.9	4.3	11
Other	2.8	0.4	2.2	5.0 *	10.4	27
TOTAL	14.3	1.6	5.8	17.0	38.7	
% by Program	37	4	15	44		100

** Includes Enforcement for tuna, clams, inlands species, halibut, etc.*