

Chapter 4

Fisheries and Oceans

Managing Atlantic Shellfish in a
Sustainable Manner

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Fisheries and Oceans

Managing Atlantic Shellfish in a Sustainable Manner

Main Points

4.1 In October 1997, we reported on problems associated with the Department's management of the Atlantic groundfish fisheries. In the current audit, we found that many of these problems also exist in the Department's management of the Atlantic shellfish fisheries. For example, we noted increases in harvesting capacity and the encouragement of increased fisher participation through open access licensing in the shellfish fisheries. In addition, we found weaknesses in the information used in making resource decisions, and gaps in monitoring, control and surveillance. The full impact of these problems is not obvious, as most shellfish fisheries are currently recording high landed values. However, in our view these are significant concerns that must be addressed to ensure that the shellfish fisheries are managed in a sustainable manner.

4.2 The Department's decisions have a profound impact on those engaged in the fishing industry and the communities that rely on the income generated from the industry. The absence of a fisheries policy that fully reflects sustainability concepts means that decisions are made on an ad hoc and inconsistent basis rather than as part of an overall framework for achieving a sustainable fishery. An open and transparent process in which clearly articulated and consistently applied principles guide decision making would provide all stakeholders with assurance that their interests are considered and that the resource is protected over the long term.

4.3 We observed resource use decisions that are not consistent with the Department's currently stated objectives for fisheries management. As we reported in October 1997, there is a need to have the government clarify fisheries objectives in legislation. The Department needs to move forward with the development of a sustainable fisheries framework that incorporates the interdependent factors — biological, economic and social — that affect the fishery.

Background and other observations

4.4 In the 1990s, Atlantic Canada saw a virtual collapse of its commercial groundfish fishery (cod, haddock, pollock, halibut and various flatfish). In the same period, however, there was a general rise in the value of shellfish landings (lobster, scallop, snow crab and shrimp). In 1997, the landed value of all shellfish in Atlantic Canada was \$920 million, which represented 81 percent of the landed value of all fish landed in the region.

4.5 The Department has stated in its key parliamentary accountability documents that its objective is conservation, or protecting the productive capacity of the natural resource that supports the fishery. It has also reported that it has an economic objective, but the expected results for this objective are not stated. The Department has indicated that it is not responsible or accountable for social outcomes. We found that most resource use decisions in the shellfish fisheries are heavily influenced by social and economic factors.

4.6 The Department's "Fishery of the Future" strategy reflects objectives that include ensuring economically viable and self-reliant fisheries, over time. However, these objectives are not fully reflected in the Department's reporting to Parliament. We found resource use decisions in the shellfish fisheries that are inconsistent with the concept of an economically viable industry.

4.7 Co-management, designed to increase industry's role, responsibility and accountability in fisheries management, is an important aspect of the Department's Fishery of the Future strategy. Participants assuming greater responsibility for their industry is an important element of sustainability. However, very little power sharing has actually occurred. In our opinion, there are weaknesses in the Department's current approach to co-management.

4.8 The Department has recognized that there are weaknesses in the fisheries management framework in the existing *Fisheries Act*. However, amendments to deal with these weaknesses have not yet been re-introduced in the House of Commons.

Fisheries and Oceans' responses to our recommendations are included in this chapter. The Department either agrees to take action or notes that initiatives are under way to address three of our four recommendations. The Department has not indicated an intention to take action at this time on our recommendation that addresses co-management.

Introduction

The rise in importance of shellfish

4.9 In the 1990s, Atlantic Canada saw a virtual collapse of its commercial groundfish fishery. In the same period, however, the region's commercial shellfish fisheries showed a general rise in the value of the catch.

4.10 In fact, shellfish landings from 1984 to 1997 rose in weight by 138 percent — from 131,000 to 312,000 tonnes. Since the early 1990s, landings have declined for lobster and scallops, but have significantly increased for snow crab and shrimp, primarily in Newfoundland and Labrador.

4.11 At the same time, the rising demand for shellfish increased the prices received by fishers. Declines in the groundfish fishery notwithstanding, the landed value of all Atlantic Canadian fish reached \$1.34 billion in 1995. When adjusted for the impact of inflation, this represented the second-highest annual landed value ever in the region. Exhibit 4.1 illustrates the trends in Atlantic landings and prices for the four major commercial shellfish species.

The changing nature of the fishery and its impact on people

4.12 Our October 1997 Report Chapter 14 discussed the dramatic impacts on Atlantic Canada following the collapse of most of its commercial groundfish fisheries. The labour-intensive nature of the fishery meant that its collapse affected large numbers of people in both the harvesting and the processing sectors.

4.13 During the 1990s, there has been an unprecedented increase in incomes of most fishers involved in the shellfish sector. While generally providing good returns to fishers, historically this sector, with the exception of the lobster fishery, has not supported a large number of

people. Nor does the shellfish sector require the same level of processing as groundfish, so it does not support as many plant workers.

4.14 The incomes of fishers in the shellfish sector have provided a stark contrast to those of fishers who depended on groundfish for a living. The 1990s saw a variety of government programs designed to provide groundfish fishers with income support and opportunities for other employment, and they have become dependent in large part on these programs for a substantial portion of their income. In the end, the programs will have cost Canadian taxpayers over \$3 billion.

Focus of the audit

4.15 This chapter reports on the management of major Atlantic shellfish fisheries by Fisheries and Oceans. We also report on the Department's progress toward developing and implementing a management framework for sustainable fisheries, especially shellfish fisheries. The chapter assesses whether the Department has managed the shellfish fisheries in a way that contributes to meeting its own stated objectives for fisheries management.

4.16 Our audit took a case approach. That is, we selected individual fisheries to determine whether and to what extent the objectives for fisheries management were pursued consistently.

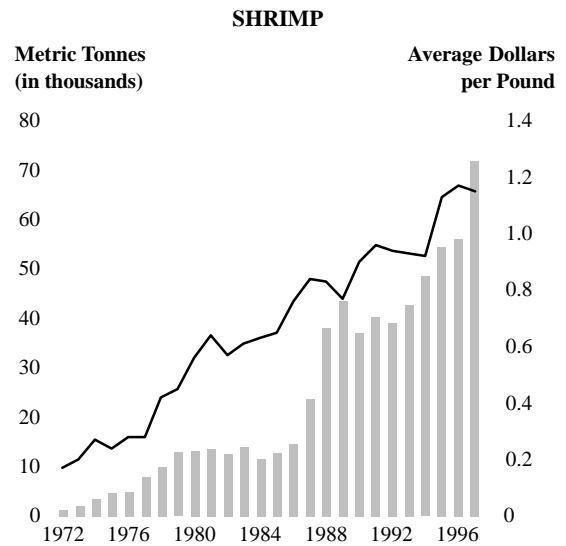
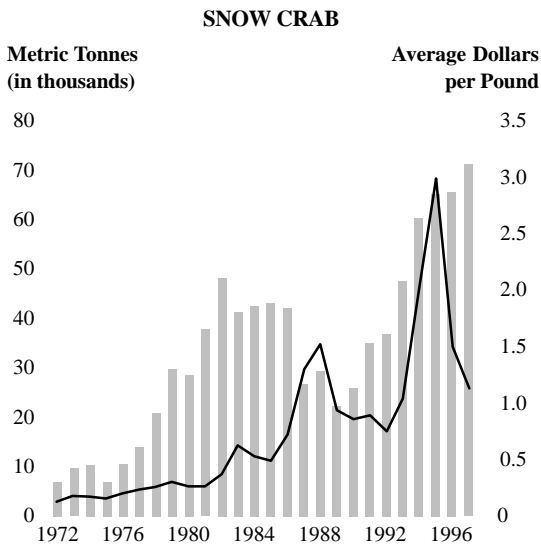
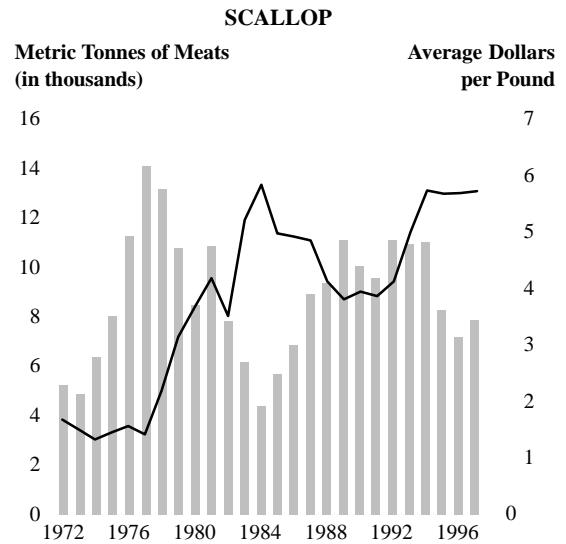
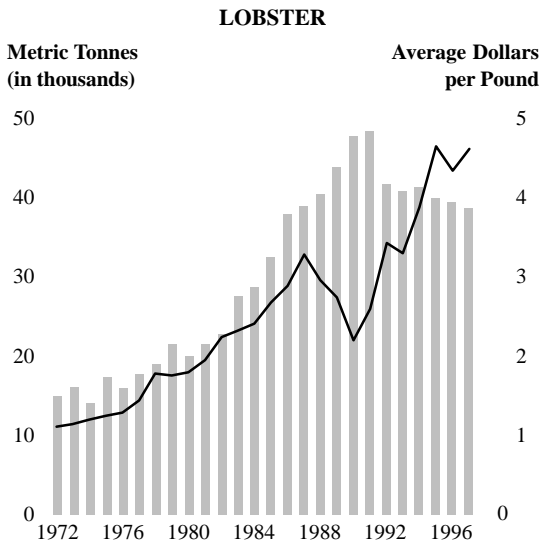
4.17 The cases selected for audit were in the lobster, scallop, snow crab and shrimp fisheries. In 1997 these fisheries represented 92 percent of the value of shellfish landed in Atlantic Canada; shellfish in total represented 81 percent of the value of all fish landings in the region. Exhibit 4.2 shows the specific areas in these four fisheries that we included in our audit. We selected the fisheries that not only have the highest value but also include all of the major fishing areas of Atlantic Canada.

In 1997 shellfish represented 81 percent of the value of all landings in Atlantic Canada.

Exhibit 4.1

Trends in Landings and Prices for Lobster, Scallop, Snow Crab and Shrimp – Atlantic Canada

█ Landings — Price



Source: Fisheries and Oceans Canada

4.18 Further details are provided in **About the Audit** at the end of the chapter.

Observations and Recommendations

Fisheries Management Framework

The powers of the Minister of Fisheries and Oceans

4.19 The *Fisheries Act* provides extensive powers to the Minister of Fisheries and Oceans. For the fisheries within the jurisdiction of the federal government, the Minister has the power to decide who fishes (by issuing fishing licences), how much fish can be harvested (by allocating quotas), the fishing methods to be used, the timing of the fishing season and many other aspects of fishing activity.

The responsibilities of the Department of Fisheries and Oceans

4.20 In its 1998–99 Part III Estimates (Report on Plans and Priorities), the Department stated that the overall departmental objectives include, among other things, undertaking policies and programs in support of Canada’s economic, ecological and scientific interests in the oceans and inland waters and providing for the conservation, development and sustainable economic utilization of Canada’s fisheries resources for those who derive their livelihood or benefit from these resources. The specific objective of fisheries management is:

...[to ensure] the conservation and protection of Canada’s fishery resource and, in partnership with stakeholders, to assure its sustainable utilization.

In its key accountability documents, the Department has informed Parliament that its objective for fisheries management is “conservation”. At the beginning of our audit, the Department informed us that

“conservation” as used here means the biological aspects of sustainability; it does not include broader economic or social issues. In the 1998–99 Report on Plans and Priorities, none of the expected results for fisheries management refer to the Department’s overall economic objectives.

Defining fisheries management objectives

4.21 Since Program Review in 1994, the Department has been pursuing the “Fishery of the Future” strategy, to make fisheries:

- economically and environmentally sustainable;
- stable and capable of providing adequate levels of income; and
- self-reliant, competitive and viable without subsidization.

These objectives are not fully reflected in the Department’s 1998–99 Report on Plans and Priorities, although the document refers to the Fishery of the Future strategy.

4.22 Moreover, neither the Department’s reports to Parliament nor its Fishery of the Future strategy reflect any consideration of the social implications of fishery management decisions. In a 26 August 1998 response to the Standing

The Minister has extensive powers.

Exhibit 4.2

Shellfish Stocks Included in Our Audit

Stocks	Fishing Areas
Lobster	<ul style="list-style-type: none"> • Southwest Nova Scotia • Southern Gulf of St. Lawrence
Scallop	<ul style="list-style-type: none"> • Offshore Nova Scotia • Bay of Fundy
Snow Crab	<ul style="list-style-type: none"> • Newfoundland • Gulf of St. Lawrence (except for Laurentian inshore areas)
Shrimp	<ul style="list-style-type: none"> • Northern shrimp • Gulf of St. Lawrence

For certain decisions, the Department has not adhered to its Fishery of the Future strategy.

Committee on Public Accounts, the Department confirmed that it does not support consideration of social factors :

A reversal of current fisheries management policy principles and a return to a social fishery to accommodate former TAGS (The Atlantic Groundfish Strategy) recipients would result in an increased conservation risk, decreased industry viability and greater costs to government in the long run in the form of higher management costs and greater access to EI (Employment Insurance).

4.23 However, in certain important decisions the Department has not adhered to the Fishery of the Future strategy, which represents its vision for the fishery. For example, Exhibit 4.3 describes three allocation decisions made to support social objectives that are not reflected in the strategy.

4.24 Another example of the Department’s pursuit of social objectives is in the Northern shrimp and Gulf snow crab fisheries. In 1997 and (for Northern shrimp only) in 1998, temporary allocations were approved for fishers’

organizations and community-based organizations, either directly or to companies controlled by them. The purpose of these temporary allocations was to strengthen or support initiatives by the organizations and to redistribute income from these lucrative fisheries to the organizations’ members. We estimate that the total landed value of these temporary allocations was approximately \$15 million.

4.25 We found that prominent themes in the management of certain shellfish fisheries have been the distribution of wealth and the sharing of benefits between the fishers pursuing “successful” fisheries and other licensed fishers, including those dependent on groundfish. In other lucrative shellfish fisheries, however, no attempt has been made to engineer a sharing of the fishery’s wealth.

4.26 The *Fisheries Act* provides the Minister and the Department with the dual roles of protecting the productive capacity of the natural resources that support fisheries and allocating the resource to those licensed to fish. In its reporting to Parliament, to the media and to the general public, the Department

Exhibit 4.3

Three Resource Allocation Decisions Reflecting Social Objectives

- The 1997 inshore allocation in shrimp fishing area 5, intended to be fished by inshore vessels under 65 feet, was allocated to several community-based Labrador corporations. These corporations, in turn, chartered or sold the allocations to the existing offshore licence holders, who in some cases made further chartering arrangements. The same practice occurred in 1998.
- In 1997 and 1998, an allocation of 3,000 tonnes of shrimp in shrimp fishing area 6 was granted to a community-based corporation that had the goal of developing a shrimp processing facility on the Northern Peninsula of Newfoundland. In both years, the corporation contracted with others to fish and process the allocation.
- Fisheries and Oceans defines an exploratory fishery as one where it is attempting to determine whether a stock can sustain a commercially viable operation, and to collect biological data for information on stock abundance and distribution. In 1995, the Minister authorized the establishment of two exploratory snow crab fishing zones in the Gulf of St. Lawrence area, to be fished by groundfish-dependent fishers who did not hold snow crab licences. This fishery was established as part of a strategy to “meet the demands for more equitable sharing of the snow crab resource in areas where it continued to be abundant”. In 1997, the Department reported to the Minister that these two zones no longer met the requirements for an exploratory fishery, as scientists had concluded that the zones had no resident stocks. The snow crab in the zones was, in fact, migrating from the adjacent snow crab fishing area 12. The Department recommended that the exploratory fishery in these zones be closed. The Minister chose to keep the zones open in 1998. While this fishery was approved as an “exploratory” fishery, fishers have never been required to complete the normal scientific protocols expected in such fisheries.

emphasizes the first role, protection. In practice, the day-to-day activities of fisheries managers deal for the most part with the second role, allocating the resource. The result of the Minister's allocation decisions is the distribution of wealth from the fisheries.

4.27 There is a natural tension between the roles of protecting resources for future use and allocating resources for current use. Social and economic pressures on the Department and the Minister will generally be to allocate resources for current use. These pressures are hardest to manage when the Department has limited knowledge to prove how much of the stock must be left unharvested to protect the resource. When knowledge about stocks is limited, it is particularly important that the precautionary approach be applied — that is, erring on the side of caution.

Policies governing the fishery are not always clear

4.28 Resource allocation and licensing decisions have important economic and social consequences. The *Fisheries Act* gives the Minister of Fisheries and Oceans absolute discretion to make such decisions. Historically, in making these decisions, the Minister and the Department in support of the Minister have considered a number of factors, including those of a social and economic nature. Examples of these factors include fishers' adjacency to the resource, historical attachment to the stock and historical provincial share. In December 1995, the Department adopted the Commercial Fisheries Licensing Policy for Eastern Canada (1996), which set out its revised position on issuing licences. This Policy makes reference to a number of factors, including those mentioned above, but it does not clearly establish how these factors are to be reflected in practice. The Policy allows for exceptions based on geographic and economic circumstances, which are not specified.

4.29 The difficulties of applying this Policy in practice can be demonstrated by the following examples:

- The Gulf shrimp fishery has historically been fished by Quebec, New Brunswick and Newfoundland fishers. In 1998, the Minister approved the allocation of 150 tonnes of Gulf shrimp to Nova Scotia and Prince Edward Island fishers. This temporary arrangement alters the historical provincial share of this stock.

- The union representing crews on offshore scallop vessels requested that the Minister grant it a percentage of the offshore scallop quota. In an internal review, the Department indicated that the request for the allocation could not be granted independent of a licence, meaning that a new offshore scallop licence would have to be issued to the union. This, in essence, would mean abandoning or providing an exception to the limited entry policy that had been in effect for the offshore scallop fishery since 1973. The allocation has not been granted to the union. In contrast to this position, however, Gulf snow crab with an estimated landed value of \$5 million was allocated in 1997 to companies set up and controlled by fishers' organizations, including unions. These companies were issued new licences to fish snow crab. Moreover, in the Northern shrimp fishery the Minister allocated 2,000 tonnes of shrimp to the union representing Newfoundland fishers and to a fishers' co-operative, even though they were not licence holders. This allocation was fished through arrangements with existing offshore licence holders.

4.30 A recent review conducted on behalf of the Department's Review Directorate observed that there is a "two-track" approach to resource allocation. The first track is based on Integrated Fisheries Management Plans, which departmental officials and the industry develop together to determine how the fishery should be managed. The second track is outside that process:

There is a natural tension between protecting resources for future use and allocating resources for current use.

industry groups or others address their concerns directly to the Minister either before the formal process or concurrently with it. We noted the latter approach in the allocation decision for the Northern shrimp fishery (see Exhibit 4.4). We observed that the same approach was also used in the consultations on changes to harvesting practices for Gulf lobster. While we understand that the Minister has absolute discretion in this area, we are concerned that the absence of transparency in fisheries management decisions has the potential to undermine a long-term perspective on sustainability of the resource.

What does the Department mean by an economically viable fishery?

4.31 The Department's Fishery of the Future strategy calls for an industry that is economically viable, over time. In general, economic viability means that those engaged in an activity receive sufficient returns to stay in business and enjoy a "reasonable" living without subsidies from government. The Department has not elaborated on what it intends to achieve when it calls for an industry that is "economically viable, over time".

4.32 We observed resource allocation and licensing decisions that did not appear to be consistent with the objective of economic viability. For example:

- As little as one tonne of snow crab was allocated to inshore Newfoundland

fishers. In this instance, the apparent goal was to maximize employment at marginal incomes rather than to achieve economic viability. The case study on page 4-13 describes the impact of management decisions on the economic viability of the Newfoundland snow crab fishery.

- In the Northern shrimp fishery, the Department's actions have encouraged increased harvesting capacity in the industry even though there is uncertainty about how long the recent increases in this stock will last (see the case study on page 4-14).

The role of government in controlling industry's harvesting capacity

4.33 The Food and Agriculture Organization of the United Nations has reported that a common problem in fisheries around the world is overcapacity, as fishers invest in larger or more efficient vessels and equipment. When they see that overcapacity has become a serious problem, governments can do one of three things. They can recognize the risk to the stocks and provide financial incentives to reduce capacity; this has been a favoured approach in Canada, although often only after major stock declines, as happened in the Atlantic groundfish and Pacific salmon fisheries. They can allow overcapacity to go unchecked, which then puts a strain on the resource. Or they can encourage industry self-rationalization through management regimes such as enterprise allocations or individual transferable quotas. In all cases, people who rely on the resource usually look to government

Exhibit 4.4

A "Two-Track" Allocation Approach – Northern Shrimp

In 1996, the Minister sought industry views and proposals on how to share increases in Northern shrimp quotas for 1997 and beyond. The results of the formal consultative process with industry were presented to the Minister on 11 April 1997 in a memorandum from the Deputy Minister. The Minister was asked to approve a formula for sharing of the increased quotas between the existing offshore licence holders and potential new entrants. This proposal was not accepted by the Minister. The Minister ultimately accepted a proposal put forward by his staff, the union representing the potential new entrants and the Department's Newfoundland Region. This new proposal recommended that all of the increase in quotas be given to new entrants and selected offshore licence holders, based on the adjacency principle. This proposal's definition of adjacency to the resource resulted in almost exclusive access by Newfoundland inshore fishers to the substantially increased quota in 1997 and 1998.

for assistance until the resource recovers, or until it becomes clear that the resource will not recover. A recent example was the income support program for those who were dependent on Atlantic groundfish stocks.

4.34 Since 1992 the Department has made efforts through licensing policy initiatives and expenditures to reduce the harvesting capacity of the groundfish sector. The Department has spent approximately \$85 million to eliminate over 1,300 groundfish licences. The vast

majority of the licences retired were in the Newfoundland Region. Nevertheless, as noted in our October 1997 Report Chapter 15, excess harvesting capacity continues to be a concern.

4.35 Since 1997 the harvesting capacity in the Newfoundland Region has increased dramatically. The increase has come in the form of 208 new shrimp trawlers (see the case study on page 4-14) and 150 vessels enlarged or replaced under Supplementary Vessel Replacement Rules for the purpose of fishing snow

Newfoundland Snow Crab Fishery – Effect of Open Access on Economic Viability

In recent years, the number of individuals in the Newfoundland snow crab fishery has significantly increased. Prior to 1995, this fishery was conducted by 822 licensed fishers (see chart). In 1997, the Minister opened the snow crab fishery to all Newfoundland core fishers through the issuance of “temporary” licences. There are now 3,182 licensed snow crab fishers. The new temporary fishers are predominantly from the small boat inshore fishing fleet, with vessels less than 35 feet. This group was particularly affected by the closure of the groundfish fishery.

Large numbers of the new entrants have been granted very small quotas that produced low income per individual. In 1997, individual quotas for the temporary inshore fishers were as low as 1 tonne, providing about \$2,000 in revenue, and averaged 2.7 tonnes, providing about \$5,400 in revenue. Although the Minister originally approved a minimum quota of 3 tonnes per individual to ensure a minimum level of economic viability for new entrants, he subsequently reduced the minimum quota to 1.8 tonnes. This change was made after industry made representations that open access be allowed. The Department further lowered the minimum to 1 tonne in order to accommodate all fishers. Departmental data on landings indicate that the new entrants rely on this fishery as a primary source of fisheries income.

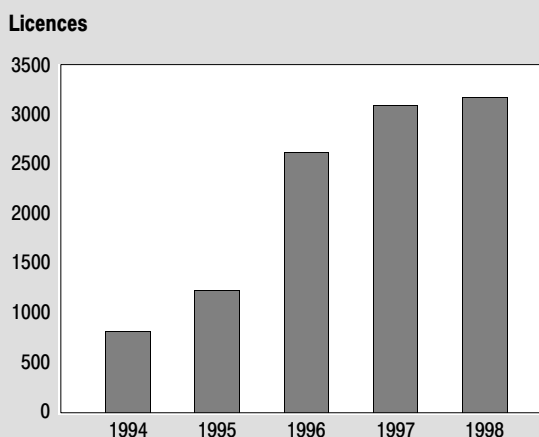
The traditional snow crab fishers have been required to vacate inshore zones to accommodate the temporary entrants. They must now fish in areas ranging from 50 to 200 miles offshore. This displacement has increased their operating costs. So they would accept the

displacement, the Department provided the traditional fishers with additional quota to offset their increased operating costs. In some of these new areas, there is uncertainty about stock status and the long-term viability of the snow crab resource.

In 1998, the total allowable catch was increased by 9.5 percent above the 1997 level to accommodate the temporary inshore fishers. The increase was contrary to the two-year management plan, which committed to no increases in quota unless substantial changes in stock status occurred. The Department’s Science Branch had initially indicated that there was no basis for suggesting a change to the management plan for 1998. In 1998, no formal Stock Status Report was produced for Newfoundland snow crab.

Our concerns. We recognize the pressures under which the Department must operate, especially in Newfoundland where chronic unemployment is a societal challenge. However, we are concerned that open access to the Newfoundland snow crab fishery has led to the entry of large numbers of fishers who are receiving marginal incomes at a time when this fishery is at historically high levels. The management of this fishery demonstrates the Department’s difficulty in balancing competing biological, social and economic factors.

NEWFOUNDLAND SNOW CRAB LICENCES



Source: Fisheries and Oceans

crab. Approximately 50 of the 150 vessels were under 35 feet long and have been replaced with vessels between 35 and 45 feet.

4.36 It is difficult for government to define and determine the harvesting capacity of industry, let alone control it. For example, the new and the enlarged vessels have a large potential harvesting capacity, which could be readily

redirected to harvest groundfish. We are concerned that this increase in potential harvesting capacity may offset the government's previous efforts to reduce capacity in the groundfish fishery. The Department has indicated that it has the means to control the transfer of capacity from the shellfish to the groundfish fishery. However, past experience has shown that government comes under

Northern Shrimp Fishery – Encouraging Growth in Harvesting Capacity Without Long-Term Knowledge

In the past two years, the Northern shrimp fishery in the Newfoundland Region has grown significantly (see chart).

Science advice. In the 1997 Stock Status Report for Northern shrimp, the Science Branch concluded that the stock was at an unprecedented level and was widely distributed. In 1998, advice provided from outside the formal stock status process indicated that the current exploitation level is low and does not immediately jeopardize the stock. However, the Science Branch also noted that this current high abundance might be a pulse, and that future rapid declines in biomass can be expected. Furthermore, the Science Branch could provide assurances about the stock for only two to three years. As noted in paragraph 4.61 of the chapter, the Science Branch did not consider the doubling of the 1998 total allowable catch in shrimp fishing area 6 to be precautionary.

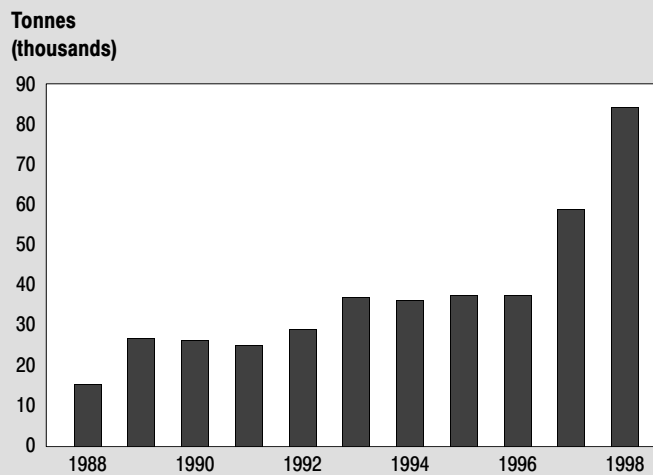
The response of fisheries management to the stock increase. The total allowable catch for area 6 was doubled in 1997 and again in 1998 for a total increase of 318 percent since 1996 (from 11,050 tonnes to 46,200 tonnes). Open access to this fishery was provided by the Minister to all Newfoundland core fishers through the issuance of temporary shrimp licences in 1997 and 1998. A condition of these temporary licences was that each fisher was required to use his or her own vessel. As a consequence of this open access management regime, the number of participants increased significantly. For example, prior to 1997 there were 17 licence holders fishing Northern shrimp in area 6, with a total allowable catch of 11,050 tonnes. In 1998 there were an additional 300 licence holders in area 6 with an additional total allowable catch of 35,000 tonnes.

Fleet capitalization. In response to the increased total allowable catch, the open access fisheries management regime, and the requirement for all participants to be equipped to harvest shrimp in order to gain access, industry invested heavily in this new fishery. Specifically, 208 of the new licencees have invested in new shrimp trawling gear. The Department estimates that the average cost of new trawler gear is \$150,000 per vessel or a total gear-up cost of about \$30 million since 1997. Although the value of the shrimp landings by these new shrimp trawlers was about \$26 million in 1998, the reliability of this revenue over time is not known given the scientific uncertainties.

Capacity growth. Fleet capitalization has led to a significant increase in harvesting capacity in the Newfoundland Region. With minor modifications, the 208 new shrimp trawlers can also be used to harvest other species such as groundfish. Onshore processing has also significantly increased since 1996.

Our concerns. The Department has encouraged significant growth in harvesting capacity while the expectations are that the size of the shrimp stock will decline rapidly at some point in the future. We are also concerned that the size of the trawler fleet in Newfoundland has increased significantly at a time when the government has taken action, through a series of licence retirement programs, to reduce overall harvesting capacity in Atlantic fisheries.

NORTHERN SHRIMP QUOTA



Source: Fisheries and Oceans

intense pressure to allocate stocks to meet capacity needs.

4.37 We observed that harvesting capacity has also increased in the lobster fishery, due mainly to improved efficiency of fishing gear, larger and more powerful boats, and improved fishing technology. This was one of the main reasons behind the Minister's recent plan for additional controls over harvesting in this fishery. Conversely, in the offshore and Bay of Fundy scallop fisheries, the Department has used enterprise allocations and individual transferable quotas respectively to enable licence holders to reduce capacity in line with availability of the resource. The number of vessels in the offshore scallop fishery was reduced from 66 in 1985 to 32 in 1996. The fleet sector that harvests 85 percent of the Bay of Fundy scallops in the inshore only recently adopted a self-rationalizing system and it is too early to determine the results of this new approach.

Departmental action to develop a fisheries management framework

4.38 Our October 1997 Report Chapter 14 dealt with the management of the Atlantic groundfish fishery. We believe that the observations and recommendations we made then are relevant to the management of any fishery. We recommended that Fisheries and Oceans:

- renew its efforts to have the government clarify fisheries objectives in legislation and develop a national fisheries policy framework;
- pursue, as a priority, completion of a consolidated policy framework related to sustaining the fisheries resource base; and
- establish measurable indicators and performance expectations to assess progress in applying guiding principles, and integrate those indicators in its planning, reporting and accountability process.

4.39 The Department responded that it would take action on our recommendations by seeking amendments to the *Fisheries Act*, preparing a framework to elaborate on its policy objectives and principles, and developing performance measures and business plans.

4.40 On 26 August 1998, the Department provided the Standing Committee on Public Accounts with updates and action plans for implementing our recommendations. On the development of a fisheries management framework the Department stated, among other things, the following:

- Since Program Review, it had pursued two interdependent and complementary objectives: the Fishery of the Future strategy — industry restructuring aimed at producing a sector that is economically and environmentally sustainable and self-reliant; and management renewal — aimed at refocussing the Department on its primary mandate of conservation and sustained use of the resource. Concurrent with budget reductions, this would also mean devolving to fish harvesters a greater decision-making role and cost responsibility in resource conservation and management.

- The Department would explore ways and means of changing the existing policy framework by December 1998 to be more consistent with the objectives of the Fishery of the Future strategy.

- As the Department had not been assigned the responsibility or the resources for managing the social and economic outcomes, it would not be developing related performance measures. Specifically, it said:

On the measure of balancing industry capacity to establish an economically and socially viable industry, it was viewed that the mandate of the Department was revised in the Program Review exercise to focus on the core business of conservation, and

The Department has indicated that it does not have the responsibility or resources to manage social and economic outcomes.

that we have not been assigned either the responsibility or the resources to manage the socio-economic outcomes. As a consequence, at the “Outcome” level, fisheries management will not measure or target performance in this area. The only exception to this rule is in situations where the Government has conferred upon the Department special responsibilities. In these cases, socio-economic outcome performance indicators would be developed as appropriate.

- The Department was committed to developing a performance measurement framework for fisheries management, to include updating the framework in the Multi-Year Strategic Plan. Measures that focussed on outcomes were to be established and implemented by December 1998.

In our view, the Department’s position in this response to the Committee is inconsistent. The Department states that it has an objective of producing a sector that is “economically... sustainable and self-reliant”. Yet, at the same time, it says it does not have the “responsibility or resources to manage the socio-economic outcomes.”

4.41 At 31 December 1998, the status of initiatives taken in response to our recommendations was as follows:

- **Amendments to the *Fisheries Act*.** These have yet to be tabled in the House of Commons. In late 1998, the Minister established a Panel to examine the key issue of partnering arrangements — an issue that underlies a number of the proposed amendments. The Panel reported on 10 December 1998 and “urged the Minister of Fisheries and Oceans not to go forward at this stage with legislation for partnering”, largely due to widespread opposition to the concept.

- **Sustainable fisheries policy framework.** In October 1998, departmental officials conducted a

strategic planning workshop. Updated draft vision and mission statements were produced and objectives and strategies to achieve the updated mission were determined. Senior management proposed objectives that clarified the meaning of industry viability, the intent of fisheries management and the social dimensions of the Department’s responsibilities. As a result of this exercise, departmental officials have determined that social and economic considerations do have a role in fishery decisions. We recognize the Department’s efforts to clarify what it is trying to achieve through its fisheries management activities; yet these initial efforts need to be formally approved and incorporated into its key accountability documents.

- **Development of a performance measurement framework.** The Department has deferred this work pending formal adoption of the fisheries policy framework.

Sustainable fisheries framework

4.42 A sustainable fisheries framework is the sum of the legislation, policies and principles that establish what society wants to achieve from the fishery; it also guides the conduct and management of the fishery over the long term. That is, having first determined what society is trying to achieve through the fishery, the Department should be able to establish the most cost-effective means of achieving it in a sustainable way. In this context, we have assumed a definition of “sustainable fishery” that is consistent with the definition of “sustainable development” in the *Auditor General Act*:

“sustainable development” means development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

4.43 A sustainable fisheries framework takes into consideration the interdependent factors — biological, economic and social — that affect the

fishery. Thus, it is by nature complex, multi-dimensional and constantly evolving. In the Appendix, we report on the “lessons learned” from our review of fisheries frameworks in other jurisdictions and from the Atlantic Canada experience.

Summary

4.44 Sustainable fisheries require that interdependent biological, social and economic factors be considered from a long-term perspective. In addition to its “conservation” role, the Department has indicated that it is pursuing economic objectives for the fishery. However, the expected outcomes of pursuing this economic objective have not been identified. We have also noted that the Department is making decisions that support unspecified social objectives. The absence of a formal fisheries policy that fully reflects sustainability concepts means that decisions on resource use are made on an ad hoc and inconsistent basis rather than as part of an overall framework for achieving a sustainable fishery.

4.45 The Department of Fisheries and Oceans (DFO) should move forward with the development of a sustainable fisheries framework, including efforts to have the government clarify fisheries objectives in legislation. The framework should guide the conduct and management of the fishery over the long term.

Department’s response: DFO has recently established a Working Group on the Reform of the Atlantic Fisheries Policy, under the responsibility of the Assistant Deputy Minister Fisheries Management and Assistant Deputy Minister Policy. Part of the mandate of this group will be to deal with the creation of a cohesive and consistent policy framework providing a broad vision of the direction of future fisheries in the Atlantic.

Implementing “Conservation” in the Shellfish Fisheries

What does “conservation” mean to the Department?

4.46 As we have noted (paragraph 4.40), since Program Review the Department has focussed on its core business of “conservation” of Canada’s fishery resource. How does the Department know when it has “conserved” fishery resources? Does it know what a healthy stock is? “Conservation” could have a number of possible objectives, such as increasing the overall size of the stock, maintaining the status quo or increasing the size of the stock available to spawn.

4.47 Each of the fisheries we examined had a planning process. All fisheries management plans that we examined included “conservation” as an objective, but only the objective for the lobster fishery was quantified. (We noted that the Department views the objective for the lobster fishery as an interim step while it develops better measures of “conservation”). Examples of objectives stated in the fisheries management plans included the following:

- to double eggs per recruit over a two- to four-year period (Atlantic lobster);
- to implement management measures that will protect and conserve snow crab resources (Newfoundland snow crab);
- to promote and ensure the conservation and protection of the snow crab resource (Gulf snow crab areas);
- to ensure the conservation and restoration of the resource (offshore scallops);
- to make conservation of the resource paramount (Northern shrimp); and
- to protect small scallops (juveniles) from recruitment and growth overfishing (Bay of Fundy scallops).

Sustainable fisheries require the balancing of interdependent biological, social and economic factors.

Most fisheries management plans did not include clear expectations of what is to be achieved.

4.48 Only the Atlantic lobster objective is clear and measurable. The other fisheries management plans include no clear expectations of what is to be achieved on either a short-term or a sustained basis.

4.49 Having the right information to make decisions about resource use is important so the decisions do not endanger the health of the stocks. The Department has indicated that when the status of stocks is uncertain, decisions on resource use will take a precautionary approach — that is, decision makers will err on the side of caution.

4.50 In addition to a lack of measurable goals and targets, we observed management decisions that did not reflect the “conservation” concerns of departmental officials. The case study on page 4-19 discusses a fisheries management decision to allow the harvest of scallops in an important nursery area for the Bay of Fundy scallop stocks, which are critically low.

Stock assessment

4.51 The Department’s Science Branch conducts annual stock assessments using information from research surveys and studies as well as information on the commercial fishery. It also consults with the industry and fisheries managers on the status of the stock. The Science Branch then provides advice to the Fisheries Management Branch in the form of Stock Status Reports. These reports are important input for decisions by the Minister, or in certain instances by fisheries managers, on how a fishery will be conducted, including the amount of fish that can be caught.

4.52 In some of the fisheries we examined, we found weaknesses in the information available to support resource use decisions. For example:

- In all lobster fisheries, there is limited knowledge of the role that the

various environmental and ecological factors play in determining reproductive success. While the Department has used one biological reference point to guide its resource use decisions, it has recognized the need to develop additional reference points to assist in its assessment of the status of the lobster stocks (the case study on page 4-20 describes the problems of gathering knowledge in the lobster fishery).

- A total allowable catch for the Bay of Fundy scallop fishery was established for the first time in 1997. This fishery is divided into eight fishing zones. The Department has only limited scientific information to support catch limits in certain zones of this fishery.

- The advice provided by the Regional Science Branch for both the 1998 Newfoundland snow crab and Northern shrimp fisheries did not follow the usual departmental practice of preparing formal Stock Status Reports (see the case studies on page 4-13 and page 4-14 for further information). The total allowable catch was increased in both fisheries in 1998.

4.53 We can also point to examples where progress is being made in the stock assessment process. In the offshore scallop fishery, science and industry are working together on an ongoing basis to understand the status of scallop stocks and to set harvest levels that protect juvenile scallops coming into the fishery. The Department’s Science Branch and industry monitor the catch of offshore scallops during the fishing season, which allows for harvest levels to be adjusted when and where necessary. In certain Gulf snow crab fishing zones, data from scientific surveys, landings and at-sea observers are used to provide industry with detailed information on location of the resource, its size and composition.

4.54 Why is there an imbalance in the quality and availability of knowledge about individual stocks? Certain stocks, such as the Northern shrimp and

Newfoundland snow crab, are now found in areas and amounts that far exceed past experience; therefore, the amount of historical scientific information available is limited. The increase in these stocks likely reflects an absence of natural predators, primarily cod, and/or

favourable environmental conditions. For other stocks, such as lobster, some of the Department's previous funding or management decisions have limited its knowledge-gathering capabilities. However, we note that in certain fisheries where co-operation between the

Inshore Bay of Fundy Scallop Fishery – Has “Conservation” Come First?

In October 1986, the Minister established a line permanently separating the inshore and offshore Bay of Fundy scallop fishing fleets. Inshore vessels were gradually phased out of the offshore fishing grounds. The inshore fishing grounds experienced a rapid increase in landings, reaching record highs in 1989, but subsequently dropped drastically.

Conservation problems identified. In a 1995 meeting between the Department and industry representatives, departmental scientists indicated that management measures in place from 1989 to 1995 had been insufficient to prevent recruitment and growth overfishing. Growth overfishing is indicated when reducing the number of scallops harvested will result in an increase in the yield of the scallop stock. Recruitment overfishing occurs when there is a depletion of spawning-age scallops to the point where they are insufficient to maintain the scallop stock.

Scientists recommended that steps be taken to reduce recruitment overfishing by substantially decreasing the meat counts (number of scallops per 500 grams) and thus increasing the size and the age of scallops harvested. In addition, they recommended closing large portions of the Bay of Fundy scallop beds to increase the supply of reproducing scallops. It was also recommended that growth overfishing be reduced by closing the remaining areas of the Bay of Fundy on a rotational basis when a large number of small scallops were harvested.

The Department recommended a management framework to industry. In August 1995, the Minister announced that industry had agreed to a decrease in the meat counts and the closure of key scallop beds for a one-year period. Despite these actions, recruitment and growth overfishing continued in the inshore Bay of Fundy scallop beds.

In early 1996, it became apparent to the Department and to industry that measures they had taken were not sufficient to protect small scallops; and catches continued to fall. The Department began discussions with industry to develop a harvesting plan with conservation measures to reduce or eliminate recruitment and growth overfishing and to develop a fleet self-rationalization plan. During discussions within the Department, scientists indicated that the Bay of Fundy inshore stocks were in desperate shape and suggested that a consideration of only biological factors would indicate that the fishery should be closed.

In August 1996, the Department decided that the fishery should be kept open in spite of the concern raised by scientists. The Department indicated as part of its decision that before the 1997 fishery would be opened, industry would have to develop a fishing plan that included specific conservation measures aimed at mitigating the effects of continued fishing. Industry would also have to develop a fleet self-rationalization plan.

Changes to conservation measures proved ineffective but fishing continued. During 1997 and 1998, the Department's fisheries managers and the industry developed a plan that contained conservation measures intended to mitigate the effects of recruitment and growth overfishing. The scallop fishery was conducted in 1997 and 1998 with a number of conservation measures (eight fishing zones with individual total allowable catches, reduction in meat counts, closed seasons, etc.) included in the fisheries plans. However, a key conservation measure that would allow the Department to monitor fishing activity by zone (the use of so-called “black box” technology) was not implemented. Also, during the fishing seasons there was limited verification of meat counts, limited at-sea patrols, and weaknesses in the monitoring of landings at dockside. Departmental scientists indicated that catch

declines and recruitment and growth overfishing continued in 1997. The impacts on the fishery in 1998 of not having adopted the key conservation measures are not yet clear.

Industry has adopted a management regime based on individual transferable quotas that resulted in a reduction in the size of the full Bay fleet (the fleet that accounts for approximately 85 percent of annual landings) from 99 active vessels to 66. The effects of this rationalization on the inshore scallop stocks have not yet been determined.

The Department allowed harvesting in a nursery area. As part of the negotiations to develop harvesting and management plans, in 1996 and again in 1997 fisheries management allowed the inshore scallop fishers access to an area known as “No Man's Land” in scallop fishing area (SFA) 29. Departmental scientists and some industry representatives recommended that the area be considered a broodstock area and be permanently closed to fishing. Departmental scientists believed that scallops produced by this broodstock would replenish the inshore scallop beds. In July 1996, the Science Branch made the following recommendation: “Given the possibility for recruitment overfishing in the fishing beds, it is preferred that SFA 29 (west of Baccaro Bank) remain closed as a broodstock area for other beds. This is a risk aversion strategy consistent with the lack of information on these resources.”

Our concerns. There is a history of growth and recruitment overfishing in this fishery and the Department has shown an inability to effectively monitor the activities of the fishing fleet. Therefore, the decision to allow fishing in “No Man's Land” appears to be inconsistent with the Department's commitment to a precautionary approach to fisheries management.

Department and industry is strong and the industry pays for additional information, there is good knowledge about the status of the stock. This has been the case in the Gulf snow crab and offshore scallop fisheries.

Management of the fisheries

4.55 In 1996, the Department introduced the Integrated Fisheries Management Policy. Integrated Fisheries Management Plans (IFMP) were to be

Atlantic Lobster Fishery – Problems with Knowledge Gathering

Lack of knowledge is not a new issue.

In the mid-1970s, lobster fishers, fisheries managers and scientists were all concerned about a possible collapse of some lobster fisheries in Atlantic Canada: the stocks were heavily exploited and recruitment failure was seen as a definite possibility because egg production was considered low. Between 1975 and 1995, the Department conducted five studies that examined, to varying degrees, the level of knowledge of lobster population dynamics. All the reports identified the need for the Department to conduct more research to better understand the role of biology, the fishery and the environment in determining reproductive success. It was only following a 1995 Fisheries Resource Conservation Council report that major initiatives were undertaken to examine these questions.

From 1975 to 1995, the Department implemented only limited changes to harvesting practices in some areas, despite concerns about high exploitation rates and low egg production. During this period, lobster landings increased to the highest level observed since 1893, when statistics on this fishery were first collected. The resulting conundrum for the Department was that catches were at a century-high level while the available scientific data were predicting a possible recruitment failure. Departmental scientists concluded that increased landings were the result of increased fishing effort and increased productivity of the stock caused by other factors. The relative contribution of these other factors to increased stock productivity was unknown.

Fisheries Resource Conservation Council report recommended areas for improvement. In 1994, the Minister of Fisheries and Oceans asked the Fisheries Resource Conservation Council (FRCC) to examine the question of conservation in the Atlantic lobster fishery and to recommend ways to improve the conservation of the stock. The

FRCC examined the state of scientific knowledge of the lobster fishery and reported that although there was a significant amount of knowledge on lobster biology and ecology, many key elements were still poorly understood.

The Council pointed out that the Department was unable to provide definitive answers to a number of key questions, including:

- the level of egg production required to conserve the lobster stocks. Scientists could not estimate the number of lobsters in the stock or the number spawning. The FRCC suggested that the Department use eggs per recruit as an index of egg production, with an interim target of 5 percent of the eggs per recruit in an unfished population. It also recommended that scientists continue to develop other indices of egg production. Subsequently, the Department adopted as an interim measure the goal of doubling existing eggs per recruit for each lobster fishing area. In most fishing areas this results in a target that is less than that recommended by the FRCC. It has recognized that there may be a need for a more appropriate definition of egg production (for example, egg production per unit area) and practical indicators that are easy to monitor; and
- the key stock recruitment relationships required to predict longer-term changes in stock size. Scientists have not fully identified the key ecological factors that contribute to lobsters' reproductive success and the successful establishment of juvenile lobsters. However, scientists had conducted a 20-year study in a fishing community in Newfoundland that was not definitive but that with 20 more years of study may provide a stock recruitment relationship for this one area.

Science limited by reduced funding and poor data. In 1995, the Science Branch set aside \$1.1 million over three years for

special research to address the priority areas identified by the FRCC. A departmental assessment indicated that this special research increased its understanding of the lobster population dynamics. However, a critical project on growth and reproduction, considered important to improving estimates of egg per recruit and egg per recruit based on a reference point, was greatly curtailed by lack of funds and reassignment of personnel.

The Department conducts research on an annual basis to determine the status of the lobster stocks. Information on commercial fishing activity is a major element to support this research. In 1998 the Science Branch reported that for lobster fishing area 34, "the lack of landings data by area fished is a dangerous situation as it makes a full assessment of the (lobster) fishery impossible." While the Department has taken steps to improve the quality of the statistics collected, there are concerns about the timeliness of the information (as noted in paragraph 4.78 of the chapter).

As alternatives to complete statistics on the commercial fishery, the Science Branch has used "index" fishers and at-sea sampling for information on the activities of the commercial fishery. Departmental budget cuts have reduced the number of samples that the Science Branch can obtain from these alternative sources. The reduced samples have increased the variability of the data collected and increased the uncertainty in the scientists' assessment of the stock status.

Our concern. Despite recent efforts by the Department, there continue to be gaps in its knowledge of lobster stocks. This limits the Department's ability to ensure that its conservation measures are working in this fishery.

developed for each fishery. These plans were intended to provide for meaningful participation by stakeholders in the management of the fisheries. They would also serve to co-ordinate the activities of the Department's various branches in managing the fisheries. However, the IFMPs are not binding on the Minister, nor do they limit his absolute discretion in making resource allocation and licensing decisions.

4.56 A review conducted for the Department was critical of the way the IFMPs have been completed. One specific problem the review noted was the impact of stakeholders going outside the IFMP process directly to the Minister. It also noted that key components of the Department (for example, Science, Conservation and Protection, and Aboriginal Affairs) were not fully integrated into the process; nor did external stakeholders feel that they were considered in the process. Further, the review noted that IFMPs were not prepared on a timely basis. Our audit findings support these observations. The Department has begun to implement a management plan in response to the review. We believe that integrated planning is important for cost-effective management of the fisheries.

4.57 In our October 1997 Report Chapter 15, we observed that rules are needed for key decisions in order to help guide resource use. We noted that without biological reference points or decision rules as guideposts, social and economic factors could influence decisions on the use of individual stocks to the detriment of the biological component of sustainability. Such rules have generally not been developed for the use of the shellfish stocks we examined except, as noted in the case study on page 4-20, in the lobster fishery. If “conservation” of the stocks is the primary objective, then fisheries managers need to work with industry and scientists to develop rules for

key decisions on resource use and include these rules in fisheries management plans.

4.58 The offshore scallop fishery uses a “roll-over total allowable catch” concept — that is, harvesting activity is adjusted on an ongoing basis according to catch rates and composition of the stock. This concept, which is included in the formal fisheries plan, is designed to limit pressure on juvenile scallops and, therefore, on their future recruitment into the fishery. This is a fishery where industry and science have developed precautionary rules for decisions on use of the resource.

4.59 We found other examples where conservation goals exist but are not part of the formal fisheries plan. These goals are in the form of reference points but have not been formally adopted as decision rules. In the Gulf snow crab fishery, for example, a predetermined exploitation rate is used in conjunction with biomass estimates to determine the total allowable catch. However, this exploitation rate does not have a strong biological basis, as it was originally chosen for economic reasons. The Gulf shrimp fishery uses a “basket” of biological indicators to recommend the direction of change in the yearly total allowable catch.

4.60 The Science Branch is currently developing a working definition of the precautionary approach and incorporating it into its advice to the Fisheries Management Branch. We support movement in this direction. Still, it is not clear how fisheries managers plan to incorporate the precautionary approach into their decision making on resource use.

4.61 The Fisheries Management Branch is not compelled to follow the advice that emerges from the stock assessment process. In some fisheries there is a direct correlation between the stock assessment advice and the fisheries management decisions. In other fisheries, considerations other than stock assessment advice play a significant role in decisions on resource use. In fact, we found that in

It is not clear how fisheries managers plan to incorporate the precautionary approach into decision making.

some such decisions it was difficult to see how fisheries managers had applied a precautionary approach:

- In 1997 changes were made to key conservation measures planned for the Bay of Fundy scallop stocks. These measures — aimed at protecting young scallops — were changed after industry and political concerns had been expressed about their impact on industry viability.
- The Newfoundland snow crab management plan, approved in 1997, was intended to be in place for 1997 and 1998 without a change in the total allowable catch, unless the scientific advice indicated that there was a substantial change in stock status. On 20 March 1998, the Regional Science Branch advised the Regional Fisheries Management Branch that there was no basis for suggesting a change to the management plan for 1998. However, on 3 April 1998, Newfoundland fisheries managers notified the scientists that they had made a commitment to review the 1998 total allowable catches for the inshore fleet. At that time, fisheries management proposed increases totalling 6.7 percent to address this commitment to the inshore fleet. The Regional Science Branch then concurred with the proposal on 6 April 1998. The total allowable catch was subsequently increased by 9.5 percent.
- The Science Branch did not consider the doubling of the 1998 total allowable catch in shrimp fishing area 6, which followed the doubling of the total allowable catch the year before, to be a “conservative or precautionary approach”. Further, as noted in paragraph 4.52, there was no formal Stock Status Report to support the 1998 decision.

4.62 The purpose of the Integrated Fisheries Management Plans is to integrate the interests of all stakeholders in the management of the fishery. However, we have observed examples of planning that did not deal with scientists’ concerns about unsustainable practices.

4.63 For example, before the inshore sector began fishing for Northern shrimp in 1998, the Science Branch and others had raised concerns about the likelihood that large quantities of small, low-priced shrimp would be dumped at sea by this sector. Such practices waste the resource and affect the future growth of the stock. It would be important that the Science Branch have access to information about the extent of such practices when it makes assessments of the stock status. However, the 1998 plan for this fishery did not reflect scientists’ concerns about dumping at sea.

Monitoring, control and surveillance — ensuring the sustainable harvest of the stocks

4.64 Monitoring, control and surveillance (MCS) refers to the systems and processes used to capture information about the commercial fishery and, in some instances, to control the fishing practices of industry. In the Atlantic shellfish fisheries the Department conducts and funds some MCS, while other aspects are delivered by private sector organizations and paid for by industry. Exhibit 4.5 shows the MCS systems and processes used in the Atlantic shellfish fisheries.

4.65 The objectives of MCS include gathering complete and accurate information about the fishery and ensuring that the fishery is conducted in accordance with the fisheries management plan and the fisheries regulations. Co-ordinated and effective MCS, including effective enforcement, is important to ensure that fishers are conducting their harvesting activities in a sustainable manner.

4.66 We observed that in most fisheries there is a lack of co-ordination in planning MCS. Responsibility for aspects of MCS is split among the Department’s various components. Despite the use of Integrated Fisheries Management Plans in many fisheries, the various components of the Department operate largely in isolation of each other. The more complex

the fishery, the less likely it is to have a co-ordinated approach to MCS. For example, the Northern shrimp fishery is one that includes both offshore and inshore fleets, covers a large geographic area and involves more than one region of the Department. Yet we found that the Plan for this fishery did not address concerns about dumping at sea by the inshore sector.

4.67 In comparison, the Gulf crab fishing area 19 fishery covers a small area that has few landing locations, a small number of participants and an industry group that is active in decisions on the management of the fishery. These factors, combined with the limited number of fishery officials involved, make it easier to implement effective MCS, including enforcement.

4.68 Our October 1997 Report Chapter 15 discussed elements of MCS in the groundfish fishery. The following observations include our comments on the Department’s progress in areas reported in that chapter, since the practices in the shellfish and the groundfish fisheries are somewhat similar.

4.69 Docksides monitoring. Docksides monitoring is the process used in most fisheries, except the lobster fishery, to gather information about landings by individual fishers. Fishers procure the services of a docksides monitoring organization to monitor their landings of fish and report them to the Department.

4.70 In our October 1997 Report, we observed that while this system was an improvement over the previous system, there were weaknesses in controls over docksides monitoring. The Department responded in part, by enacting regulatory changes designed to control the activities of docksides monitoring organizations; these came into force 1 January 1999. We observed that the problems in docksides monitoring for groundfish also applied to shellfish.

4.71 In 1998, enforcement officers were requested to conduct “audit” tests of docksides monitoring activity to provide information about its overall effectiveness. Only the Newfoundland Region attempted to conduct these audits. It encountered problems and was not able to obtain the desired information about the operation of docksides monitoring in Newfoundland. Still, we are encouraged that the Newfoundland Region made this initial attempt and that in the 1999 fishing year it appears to be changing its approach to the “audit” of docksides monitoring.

4.72 At-sea observers. There are several methods available to the Department to monitor and control fishing practices at sea, although at-sea observers on fishing vessels or boarding by enforcement officers are the methods that provide first-hand insight. The main practices that these methods address are dumping and discarding at sea or using illegal harvesting methods.

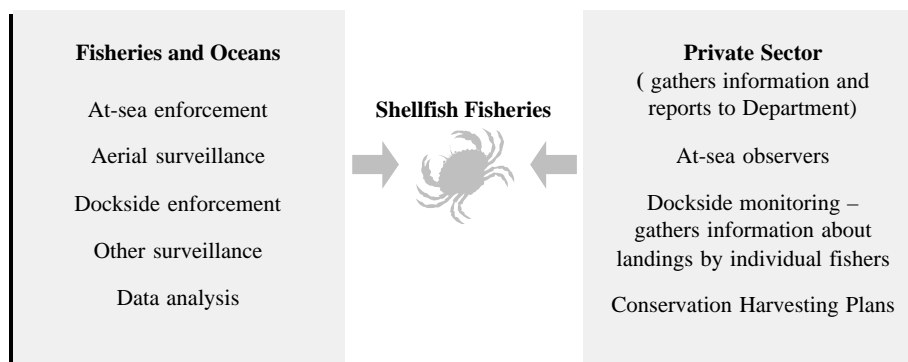


Exhibit 4.5
Monitoring, Control and Surveillance Systems Used in the Atlantic Shellfish Fisheries

**Information from
at-sea observers was
not used effectively to
manage the fishery.**

4.73 In October 1997, we noted that the information provided by observers was not being used effectively to determine the extent of unsustainable fishing by the groundfish industry. In addition, the Department had not developed a systematic approach that integrated information from at-sea observers and other sources into its management practices. These observations also applied to shellfish management in 1998.

4.74 Coverage targets — the percentages of fishing trips planned with at-sea observers on board — vary among fleets, from no coverage in the lobster fishery to 100 percent coverage in the offshore Northern shrimp fishery. Moreover, different targets exist even for fleets fishing the same stock:

- Coverage targets for Northern shrimp are 100 percent of the offshore sector and 10 percent of the inshore fishers.
- For Gulf snow crab, coverage targets are 20 percent and 5 percent in areas 12 and 19 respectively, although these are adjacent areas.
- Newfoundland snow crab has no observer coverage of the inshore “temporary” fleet, but a target of 5 percent coverage of the rest of the fleet.

We could find no systematic basis for establishing coverage targets for at-sea observers.

4.75 In some fisheries, such as Gulf snow crab and Newfoundland snow crab, targets for fleet coverage by observers were met in 1998. Even so, only 1.5 percent of the actual catch of Newfoundland snow crab was observed. In the Northern shrimp fishery, the inshore fleet in shrimp fishing area 6 attained 5 percent coverage in 1997 and 6 percent in 1998; the target for each year was 10 percent.

4.76 While some information from at-sea observers is used to support science or enforcement activity, we found that for

the most part it was not used effectively to manage the fishery. For example, management ignored some observer information that had been collected specifically to address key conservation concerns. In 1998, the Gulf snow crab area 18 fishery had a protocol established for conditions that required a closure. If the amount of landed crab that was soft-shelled (recently molted) exceeded 20 percent of the catch over a 48-hour period, industry was advised to modify its practices. If the same conditions existed in the subsequent 48-hour period, the fishery was to be closed for the season. We noted several occasions when the incidence of soft-shelled crab exceeded 20 percent for two consecutive 48-hour periods without the closure of the fishery. We noted that the fishery was closed three times during the season and subsequently reopened. We also observed that as the incidence of soft-shelled crab increased, the amount of at-sea coverage decreased. In fact, observer coverage was lowest when the percentage of soft-shell crab was highest. In the Newfoundland snow crab fishery, at-sea observer information on the incidence of soft-shelled crab is not used to determine whether closure is warranted.

4.77 In October 1997, we noted that the Department was not using information from at-sea observers to determine the extent to which the groundfish industry’s practices were unsustainable. This type of analysis is referred to as “indexing” — the practices and catches of vessels with at-sea observers are compared with those of the other vessels. This gives an indication of whether fishers engage in unsustainable practices when observers are not on board. We found in the shellfish fishery, too, that as a rule the “indexing” analysis is not completed. The two exceptions were the Newfoundland snow crab fishery (1996 and 1997) and Gulf snow crab area 12 (1998). The “indexing” analysis showed the occurrence of highgrading (retention of only higher-value snow crab) and discarding — 25 percent in the Newfoundland snow

crab fishery and 20 percent in Gulf snow crab area 12 fishery.

4.78 Fishery management

information systems. The observations we made in 1997 about the fisheries management information systems are still valid. These systems are of limited use to those engaged in fisheries management. There is a lack of integration between the various systems, and the information is not timely or complete. For example, information on lobster landings for 1997 was still not available by December 1998. The Department has a five-year plan to replace these systems.

4.79 Aerial surveillance. Aerial surveillance is heavily concentrated on fisheries near the international boundaries, with limited coverage of the shellfish sector. It is used to provide management with information on industry activity, to help target enforcement activities, and to monitor and enforce specific zone areas.

4.80 Other surveillance. The Department is experimenting with other types of innovative surveillance techniques. For example, the offshore scallop fleet has adopted so-called “black box” technology, which uses global positioning systems to monitor activity. This system provides the Department with a real-time monitoring capability.

4.81 Enforcement. We observed that enforcement activity is more rigorous in some fisheries than in others. The reason for this is not always obvious but depends on the circumstances in each fishery. For example, there is a relatively high level of enforcement in the Gulf snow crab area 19 fishery.

4.82 By contrast, there is minimum enforcement coverage in the Bay of Fundy scallop fishery. Enforcement officials believe that putting more resources into monitoring this fishery would not be productive, given the combination of the existing fisheries management plan and the lack of at-sea enforcement capability.

In fact, the post-season review of conservation and protection for this fishery states that the existing fisheries management regime cannot be enforced.

4.83 We found that there are gaps in enforcement coverage at sea because the Department does not have the vessels to cover certain areas. For example, midshore and offshore shellfish areas have little or no coverage by patrol vessels. Near-shore coverage (closer than 20 miles) has recently improved. Since 1996, the Department has purchased 69 specialized vessels to cover this area. In areas where there is limited at-sea enforcement, at-sea observer coverage becomes the principal tool to control unsustainable harvesting practices such as discarding and dumping; however, as we have already noted, for the most part this tool is not being used effectively. Exhibit 4.6 shows, for shellfish stocks included in our audit, the areas where the Department has limited or no capability to perform at-sea enforcement.

4.84 In 1998, the Department conducted forensic audits and enforcement actions in several fisheries, including snow crab fisheries in Nova Scotia. These enforcement actions have provided an insight into certain unsustainable practices by fishers and those who buy their fish, and have led to the laying of a number of charges. Up until now, the Department has relied heavily on the skills of a few individuals to conduct its forensic audits. However, it is working to develop the institutional capability to continue this important activity.

4.85 Administrative sanctions and penalties. Under the Department’s Administrative Licence Sanction Policy, the Regional Director General could apply a sanction (for example, suspend the right to fish for a period of time) in addition to criminal prosecution in the event of a serious conservation-related offence. As we noted in October 1997, the Department has put the sanction policy on hold

pending the hearing by the Federal Court of Appeal of several court decisions made by the Federal Court–Trial Division, which held that the Minister did not have the authority to impose administrative sanctions. Some form of sanction can be a cost-effective tool because it can be tailored to the nature of violations and can be applied in a timely manner.

Summary

4.86 The Department has not set out what it means by “conservation” in a way that would guide its managers when making resource use decisions. While fisheries managers understand that the “conservation” objective reflects the biological aspects of sustainability, most fisheries management plans we reviewed did not contain objectives that were clear and measurable. We found weaknesses in the information available to support resource use decisions. The Department does not have biological reference points





or guidelines for key decisions on the biological component of sustainability. Gaps and weaknesses in the monitoring, control and surveillance systems and processes limit their operational effectiveness.

4.87 The Department should develop, over time and in consultation with fishers and other stakeholders, biological reference points and conservation guidelines as the basis for making recommendations on resource use decisions.

Department’s response: Fisheries and Oceans has established a Working Group that has been given the responsibility of clarifying its Atlantic fisheries management policies. In the context of this initiative, a number of broad management aspects will be addressed, including better defining conservation and the precautionary approach. Once these definitions are adopted, this would lead to the establishment of biological reference

Exhibit 4.6

**Shellfish Stocks Audited –
 Areas with Little or No At-Sea
 Enforcement Capabilities**

-  Lobster
-  Scallop
-  Shrimp
-  Snow Crab

Source: Review of Fisheries and Oceans data



points and of rules for taking conservation-related decisions.

4.88 The Department should correct weaknesses in its monitoring, control and surveillance systems and processes.

Department's response: Under the framework developed by DFO for the preparation of Integrated Fisheries Management Plans (IFMPs), it is provided that they are to include enforcement measures for the control and monitoring of fishing activities to achieve management objectives. Many of the existing IFMPs for shellfish fisheries already include such measures and any new plan being developed along the IFMP framework will provide for such measures. Any gap or weaknesses in the surveillance systems are addressed as they are brought to the attention of the responsible managers.

Co-management — An Important Initiative

4.89 The Fishery of the Future strategy has called for the “devolution to fish harvesters of a greater decision-making role and more responsibility for costs of resource conservation and management”. Initially, the government proposed amendments to the *Fisheries Act* that promoted a form of partnering as the way it would structure the devolution of decision making. These amendments did not receive final parliamentary approval and died on the Order Paper. The Department eventually decided to move forward with a different concept, called co-management.

What is co-management?

4.90 At the most basic level, co-management is a form of power sharing. The extent and form of this power sharing can be quite varied and can evolve over time. Co-management involves an agreement between at least one level of government and another group. A definition of co-management has been put

forward by the National Round Table on the Environment and the Economy (NRTEE), in its paper *Sustainable Strategies for Oceans: A Co-Management Guide*:

Co-management is a system that enables a sharing of decision-making power, responsibility, and risk between governments and stakeholders, including but not limited to resource users, environmental interests, experts, and wealth generators.

4.91 The NRTEE has concluded that a co-management approach to ocean issues, including fisheries management, has potential benefits that include bringing together interests, changing relationships, fostering joint accountability, supporting transparency and autonomy, devolving decision making and responding to regional needs.

The Department's approach to co-management

4.92 The Department's “Framework and Guidelines for Implementing the Co-management Approach” (17 April 1997) describes four possible levels of co-management. The first and most basic level that the Department considers to be co-management has user groups providing input to the Integrated Fisheries Management Plans. The second level has user groups, through their legally constituted, representative organizations, entering into agreements that reflect a greater involvement in the management of their specific fishery. At the third level, fishers would enter into formal partnering through legally binding arrangements that transfer greater responsibility to industry. This level would require changes to the existing *Fisheries Act*. The fourth level is co-management legislated under land claims settlements.

4.93 In the fisheries that we examined, only the first and second of these levels of co-management were represented. The third level has not been pursued because

Co-management is a form of power sharing.

the amendments to the *Fisheries Act* did not receive final parliamentary approval. The Northern shrimp fishery conducted within the bounds of the Nunavut Settlement Area is subject to the Nunavut Land Claims Agreement; this is a form of legislated co-management. Our audit did not examine this particular arrangement.

4.94 The co-management arrangements that we examined involved no sharing of real decision making but they did formalize the process of consultation with stakeholders. Also, there was no broad-based stakeholder involvement; instead, the arrangements focus on already identified licensed fishers or their organizations.

Is it co-management or offloading of costs?

4.95 In May 1996, the Department issued a paper entitled *Fisheries Management Partnering Policy Principles*. Among other things, this paper sets out the principle of cost recovery:

... all resource management costs that are attributable to the fleet and that result in or support private benefit to the fleet should be either paid for or undertaken by the fleet. Those costs which can be associated with public benefits would be paid for through appropriations. This will require the calculation of attributable costs for fisheries supported by a credible departmental costing system.

4.96 We found that the Department has not determined which of its resource management activities, including science activities, result in or support private benefit to the various fleets. In other words, it has not consistently made the distinction between its core activities and other activities. In addition, it does not have a costing system that could generate this kind of information.

4.97 In reality, the types of costs recovered from industry are quite varied. In some sectors, such as offshore scallops,

the industry itself pays directly for the cost of certain fisheries science activities. In other sectors, costs are recovered from the industry but there is no consistency in the types of costs that are recovered. For example, in Gulf crab fishing areas 12 and 19 a majority of the costs of stock assessment have been recovered from industry. By contrast, in the Gulf shrimp fishery only science costs that were incremental to existing arrangements were recovered.

4.98 It is useful to look at the fisheries where industry does not pay any of the costs of fisheries management and science. There, for example, the Department funds the costs of the annual stock assessment process, including any research surveys. Yet in 1996, when the Department wanted to enter into a co-management arrangement with fishers in Gulf snow crab fishing area 12, it asked them to pay the costs of stock assessment, including the research survey. When the industry refused to pay these costs because of a dispute with the Department over the sharing of the 1996 quota, the Department did not carry out the survey for that year. In the following year, the industry funded the research survey. Given its “conservation” objective it is not clear why, in this case, the Department has considered the stock assessment process, including the research surveys, to be a private rather than a public benefit.

4.99 Co-management, as it has been applied, has added another layer of management costs to the existing structure. A panel appointed by the Minister to study the partnering concept reported on 10 December 1998, “Those who have negotiated a co-management agreement with DFO admit that the process was both time-consuming and costly.” In addition, the panel reported that all of the people it consulted outside the Department felt that co-management represented a downloading of fisheries management costs from the Department to industry. The Department has not

The Department has not defined its core activities.

determined whether the total cost of managing the fishery, for both industry and government, is higher or lower under co-management.

4.100 In paragraph 4.24, we noted that fishers organizations were given temporary allocations of shellfish to strengthen or support initiatives by the organizations and to redistribute income to their members. Before approving the temporary allocations, the Department had the fishers' organizations submit a business plan for fishing the allocation and using the resulting benefits. In certain fisheries (for example, Gulf crab fishing area 12), fisher organizations that received the temporary allocations charged fees or imposed other conditions for access to a portion of the allocation. Once the allocations were granted to the fisher organizations, the Department had no

mechanism to hold them accountable for following the business plans they had submitted.

Arrangements with third parties

4.101 We have concerns about the way the Department implemented financial arrangements with fisher organizations. The case study below describes our concerns about the imposition of a fee for access, totalling \$5 million in 1997 and \$2 million in 1998, that may not be contemplated in the legislation.

4.102 We also have concerns about the way the Department is using a specified purpose account to reimburse its own departmental expenditures. The *Financial Administration Act* requires all public moneys to be deposited to the credit of the Receiver General. These funds generally are recorded in the Accounts of Canada as

Solidarity Funds – Imposition of a Fee That May Not Be Contemplated in Legislation

In 1997, changes to allocations for Gulf crab fishing area 12 resulted in the displacement of many plant workers and crew members. In response, a fund was established to provide employment opportunities for those affected. According to departmental documents and press releases, this fund (Solidarity Fund) was to be voluntarily established by industry and was to be operated at arm's length from the Department. Initially, a fund was to be established for New Brunswick only, but pressures from crab fishers in other provinces led to the creation of similar funds in Quebec, Nova Scotia and Prince Edward Island.

Fishers in area 12 contributed \$5 million in 1997 and \$2 million in 1998 into the funds through a levy on the price paid per pound of snow crab landed. Fishers each paid to their fisher's organization a fee of \$0.15 per pound in 1997 and \$0.08 per pound in 1998. For example, a fisher who was allocated 300,000 pounds was required to pay \$45,000 in 1997 and \$24,000 in 1998.

In both 1997 and 1998, the Department allocated quotas to companies established by the fishers' organizations. In each year,

approximately 20 percent of the snow crab that had been originally allocated by the Minister to the traditional midshore fishers was reallocated by the Department to these organizations. Departmental officials have informed us that a majority of the traditional midshore fishers approved, by a vote, the overall co-management approach, including establishment of the solidarity funds.

Subsequently, the Department approved the transfer of this 20 percent allocation from the fishers' organizations to the individual fishers. However, the Department approved transfer requests from the fishers' organizations only after receiving confirmation that the individual fishers had paid the per pound levy to the organization and that the moneys were on deposit in an "in trust" account created at a financial institution (in trust pending transfer to a solidarity fund). Release of moneys from the "in trust" account to the solidarity fund was not completed until the financial institution received "notification from the Department of Fisheries and Oceans (DFO) that a legal entity or instrument that meets the requirements/satisfaction of DFO has been created".

Prior to authorizing transfer of money to the solidarity funds, the Department required business plans describing how the money would be used. It also made suggestions on the funds' structure and mandate. In New Brunswick, a departmental official sits on the fund's Board of Directors and influences decisions on projects to be financed with fund money.

Our concerns. The Department is involved in fund decision making and in ensuring that the levy is paid and transferred to the solidarity funds. In our opinion, through these actions it has effectively imposed a fee on fishers to access the resource, which does not appear to be contemplated in legislation.

In addition, the Department has no mechanism to report on its activities with respect to these funds. The Department has stated that it is operating at arm's length from the funds and, therefore, in our view is not acting in a transparent and accountable fashion.

revenue. However, there are exceptions to this requirement. For example:

- Parliament may give a department the authority to apply such funds against its appropriation as a negative expenditure (“net-voting authority”).
- The Receiver General for Canada may give a department the authority to establish a specified purpose account (an account in the Consolidated Revenue Fund) to receive and disburse moneys for specific activities.

4.103 Treasury Board policy requires that specified purpose accounts must not be used to reimburse departmental expenditures. However, goods and services provided by departments may be purchased with specified purpose funds when:

- the department providing the goods or services is not otherwise involved in the use of the money (that is, it is not part of the cost sharing or joint project agreement); and
- the department providing the goods or services operates under a revolving fund or net-voting authority.

4.104 Fisheries and Oceans is disbursing money from a specified purpose account to reimburse its own departmental expenditures (that is, the salaries of scientists, conservation and protection officers, and fisheries resource managers) incurred under a joint project agreement with third parties. The Department does not have a revolving fund and does not have net voting authority. In our view, the Department’s management of the specified purpose account is not consistent with the Treasury Board policy that governs this activity.

Summary

4.105 It is important that the Department move away from micro-management of the fishery to a form of industry participation or decision

making that clearly articulates accountability arrangements. Co-management arrangements that we examined are largely cost-sharing arrangements and have involved no sharing of real decision making.

4.106 The Department should clarify its objectives for co-management and, where necessary, seek parliamentary approval to implement this approach.

Department’s response: Fisheries Management co-management is about DFO and fishers working together to better manage Canada’s commercial fishery. This concept is at an early stage and many pilot projects have been undertaken. The co-management approach builds on a renewed relationship between government and the fishing industry. The approach we have developed is the co-development, with industry, of an Integrated Fisheries Management Plan, which sets out harvest levels, conservation requirements and certain allocation processes for participants. This is undertaken under the authority of the Fisheries Act. As well, and on a voluntary basis, Joint Project Agreements are negotiated with fishers or their representatives. These are legally binding agreements and are not directly related to the IFMP. The legal authority is the Financial Administration Act. Control measures are in place within the Department to ensure financial and legal aspects are respected before concluding these arrangements.

Although the first recommendation of the Panel on Partnering urges the Minister of Fisheries and Oceans not to go forward at this stage with legislation for partnering, its second recommendation is to urge the Minister and DFO to pursue co-management and partnering as an important building block for the fishery of the future. DFO will pursue the co-management approach with interested groups.

Conclusion

4.107 We noted significant weaknesses in the Department's management practices designed to achieve its objectives for the Atlantic shellfish fishery. Our audit found decisions that contradict the Department's Fishery of the Future strategy, which formed the basis of our criteria for this

audit. In addition, the Department is pursuing social objectives that it has not articulated to Parliament, and economic objectives for which it has not identified expected results. There is an urgent need for the Department to clarify these objectives and to develop and implement the strategies to achieve overall sustainability of the Atlantic shellfish fisheries.



About the Audit

Objective

The objective of our audit was to assess the extent to which the Department's fisheries management practices in the Atlantic shellfish fisheries support and complement its management objectives.

Scope and Approach

In October 1997 we reported on weaknesses in the management of the Atlantic groundfish stocks, and chronicled the problems that eventually led to their collapse. While groundfish landings are at historical lows, the shellfish industry is currently recording historically high landings. Lobster and scallop fisheries have a long history in Atlantic Canada but the importance of other shellfish fisheries is a more recent phenomenon, with some having become important only in the 1980s. Since then, the landed value for most shellfish has risen dramatically.

The subject of this audit was the Department's fisheries management practices in the Atlantic shellfish fisheries. Our approach was to assess whether the Department's management of the shellfish industry has been designed and operated to meet its stated objectives for fisheries management, including related science functions.

We examined the lobster, snow crab, shrimp and scallop fisheries to determine whether and to what extent the fisheries management objectives have been implemented in practice. In addition, we reviewed fisheries management practices to determine whether they are consistent with the management objectives.

We conducted this audit through interviews with departmental staff and representatives of industry. We examined and analyzed departmental files, data and documentation. We observed enforcement officers carrying out their activities in ongoing fisheries.

Criteria

We expected that the Department's fisheries management practice would:

- be designed and implemented to achieve the biological aspects of a sustainable resource and to assure sustainable utilization of the resource;
- include sharing responsibility with industry, where appropriate and within the limits of existing legislation for fisheries management and decision making, while holding it accountable for the agreed-upon sustainable use objectives; and
- support the Department's strategy to make fisheries economically viable and self-reliant over time.

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Appendix

Good Practices Review — Sustainable Fisheries Framework

The history of world fisheries provides many examples of unsustainable fisheries. Over and over again, significant world fish stocks have been reduced to levels far below what could be considered sustainable. In fact, the Food and Agriculture Organization (FAO) of the United Nations has reported that 60 to 70 percent of the world's fish stocks require urgent intervention to avoid further decline of fully exploited and overfished resources and to rebuild depleted stocks.

As part of this audit, we reviewed fisheries frameworks in other jurisdictions and material written on sustainable fisheries by notable organizations such as the FAO, to determine if there were lessons to be learned for our Canadian context. It should be noted that the lessons learned represent the strengths we observed in all of the fisheries frameworks of the jurisdictions we reviewed, including Canada. They do not represent observations about the fisheries regime of only one or two jurisdictions.

Our intention in preparing this review of good practices is not to provide a prescriptive approach to fisheries management. Rather, we believe that it is important to note those practices that appear to support sustainable fisheries.

Lessons Learned

Legal framework for sustainability. We observed jurisdictions where the legislation governing fisheries management reflects important concepts of sustainability. For instance, the means by which the biological, economic and social factors affecting the fishery are to be considered are established in a clear and transparent fashion. Other important factors set out in legal frameworks include conservation goals, rules over access, issues of property and use, enforcement, and dispute resolution. In addition, the legislative bodies of certain jurisdictions have put a good deal of ongoing effort into considering and debating the legal framework needed to support a sustainable fishery.

Science and precaution. The objectives of those responsible for managing and of those fishing should be to continually expand the understanding of the individual stocks but also to understand the important interactions of species in the ecosystem. Included in this understanding is the ability to take into account natural environmental fluctuations in the ecosystem. We observed operational decision rules based on biological reference levels that have been developed from an understanding of the affected stocks and ecosystems. In recognition of the limits to scientific approaches, management regimes can incorporate methodology that uses a precautionary approach when confronted with uncertainty. It should be recognized that the precautionary approach is a developing concept and that much of the work on it has been undertaken by scientists rather than by fisheries managers, yet it is the fishery management that has to be precautionary, not the science. Harvest amounts respect the biological reference level where possible, and strong monitoring is undertaken to ensure that the harvest amounts are respected. Knowledge of changes in the ecosystem is important in considering their impacts on the harvest, although it is recognized that this is a developing area.

In most jurisdictions, knowledge-gathering processes depend very heavily on biology while underusing the social and economic sciences. We did observe in at least one jurisdiction the use of economics in establishing important decision rules and ecosystem impacts. The involvement of industry and affected communities in decision making could lead to a higher level of involvement of these other sciences in knowledge gathering.

Vested interest of participants. Successful fisheries management regimes ensure that all participants have a vested interest in promoting and achieving a sustainable fishery. A primary vested interest is the economic viability of industry.

Responsibility of industry. We noted that those who receive the right to fish are held responsible in some jurisdictions for any of their activities that are not sustainable. Ultimately, the penalty they pay for unsustainable behavior outweighs any benefit of such behavior.

Industry plays an important role in decision making in the fishery, whether in a formal or informal way.

A strong fisheries management institution. In some jurisdictions, the government institution responsible for protecting the public interest in the resource can hold accountable those given the right to fish. In several jurisdictions, the cost of fisheries management is either partially or fully recoverable from the industry that benefits from the resource. The government institution is held accountable for the cost-effective delivery of a specifically defined fisheries management function.

In addition, the government institutions are supported by clearly articulated principles for resource allocation decisions. The decisions are made in a transparent and equitable fashion and are subject to challenge.

Government subsidization. The FAO has promoted a policy that government assistance to the fishery, either in the harvesting or processing sectors, should be the exception rather than the rule. The fishery is a fully mature and, for the most part, fully exploited sector. Therefore, government subsidization would have the effect of modifying the decisions of those participating in the fishery — for instance, fishers might stay in the fishery even though it would not otherwise be in their economic interest. We observed that several jurisdictions have adopted a policy of subsidy elimination.

Value added. We noted that promotion of the concept of highest possible value added provides a higher net economic return to the individual and the economy. In the end, it promotes a greater respect for the resource.

Action and timeliness. The legal framework, including a conceptual understanding of sustainability, is very important but needs to be supported by appropriate, timely action to ensure that sustainability is actually achieved.