

**1999 CONSERVATION
REQUIREMENTS FOR THE
GULF OF ST. LAWRENCE
GROUNDFISH STOCKS
AND COD STOCKS IN
DIVISIONS 2GH AND 3Ps**

**REPORT TO THE MINISTER OF
FISHERIES AND OCEANS**

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TABLE OF CONTENTS

Chapter 1: Introduction	5
Chapter 2: Seals	11
Chapter 3: Environmental Overview	13
Chapter 4: Groundfish Stocks of the Gulf of St. Lawrence	15
1. Cod 4RS3Pn	16
2. Cod 4TVn	19
3. American Plaice 4T	23
4. Witch Flounder 4RST	25
5. Greenland Halibut 4RST	27
6. White Hake 4T	29
7. Atlantic Halibut 4RST	31
8. Winter Flounder 4T	33
9. Yellowtail Flounder 4T	35
Chapter 5: Cod Stocks in Newfoundland and Labrador	37
10. Cod 2GH	38
11. Cod 3Ps	40
Chapter 6: Science Priorities Letter	43
Appendices	
FRCC Mandate and Membership	A1
Letter to stakeholders and Questions for discussion at Consultations	A7
Briefs received FOR consultations	A13

CHAPTER 1:

INTRODUCTION

This report is the third in a series of reports the Fisheries Resource Conservation Council (FRCC) has produced to provide advice to the Minister of Fisheries and Oceans on conservation requirements for Atlantic and eastern Arctic groundfish stocks for 1999. This report deals with all groundfish stocks in the Gulf of St. Lawrence as well as cod stocks in Divisions 2GH and 3Ps.

In the past, the FRCC has produced a single report annually which included advice for all groundfish stocks. Beginning in 1998, the FRCC produces separate reports for different stock areas. These separate reports allow the most recent information on the state of the groundfish stocks to be used in formulating our recommendations. For the 1999 fishery, the Council has already produced two other reports – 1999 Conservation Requirements for Groundfish Stocks Other than Cod in Sub-Area 0 and Area 2+3 (October 1998 – FRCC.98.R.5) and 1999 Conservation Requirements for Scotian Shelf and Bay of Fundy Groundfish Stocks, Redfish Stocks, Units 1-3 and 3O and Groundfish Stocks in Division 3Ps (November 1998 – FRCC.98.R.6).

For 1999, the Department of Fisheries and Oceans (DFO) Science held a special zonal assessment in Rimouski, Quebec for the following cod stocks: 2J3KL, 3Ps, 4RS,3Pn and 4TVn. This special assessment was held from March 1-12, 1999 in order to incorporate all available information into the assessment including the fall and winter groundfish surveys, and the results of the 1998 sentinel fishery. The FRCC believed that it was important to have the results of the latest assessment before we consulted on these stocks.

CONSULTATIONS

Before making its recommendations the FRCC conducted a series of public consultations throughout the Maritimes, Quebec and Newfoundland and Labrador. In the fall of 1998 the FRCC conducted a round of public consultations in Newfoundland on stocks other than cod, and in Nova Scotia on all Scotian Shelf and Bay of Fundy groundfish stocks. In April 1999, the FRCC held an extensive round of consultations in Gaspé, Cap-aux-Meules, Moncton, Port Hawkesbury, Port-aux-Basques, Port-au-Choix, Grand Falls and Clarendville on Gulf groundfish stocks and the 2J3KL and 3Ps cod stocks.

Over 1,000 fishers, scientists and other stakeholders participated in these April consultations and others who could not attend submitted their views in writing.

GULF COD STOCKS

In previous years, industry representatives have questioned the basis for differences in the Council's recommendations for the cod stocks in 4RS3Pn and 4TVn. The concern centers primarily on the ratio between the proposed TAC, or overall removals, and the biomass, as reported in the Stock Status Report (SSR). In making its recommendations, the FRCC recognizes that, although the two stocks are adjacent to one another, the ecosystem they belong to are quite distinct and different. For instance, the 4T area supports species like American plaice and white hake, while the 4RS ecosystem supports species like capelin and shrimp. Historically, the Northern Gulf Cod stock has been approximately 1.5 times more productive than the Southern Gulf Cod stock. According to scientific assessments, the Northern Gulf Cod did not experience such low recruitment levels as observed in the Southern Gulf and it is presently recovering more rapidly. FRCC recommendations reflect these considerations as well as other factors such as geographical distribution and the fish condition factor.

In considering the Gulf groundfish stocks, the Council was struck by corresponding changes to the summer distribution of a number of migratory stocks. To generalize, the abundance of these stocks, which include both Gulf cod stocks, several flatfish species and white hake, is currently much lower than historical levels in the western portion of the summer range. At the same time, the abundance of these stocks over the eastern portion of their summer range is either less reduced, unchanged or even increased.

While this phenomenon has received passing attention from DFO Science on a stock by stock basis, the Council believes there would be benefit in a synoptic review and analysis of such distributional shifts through time in Gulf stocks. Taking a multi-species approach may shed more light on possible causes underlying these observed shifts. Additionally, as stocks rebuild in future and the prospect for reopening and/or increasing quotas improves, decision-making on these issues will benefit from having a clearer view on these distributional shifts and the relationship between stock distribution and stock status.

4TVN COD

The divergence of view between scientists and fishers is nothing new and is found in most stocks. This is one of the challenges facing the Council each year as it discusses its recommendations. However, the Council is concerned that the divergence of views regarding this cod stock is particularly wide. Discussions within the Council on what level of catch should be set for this stock were therefore particularly difficult. In cases such as this, it has become increasingly difficult for the Council to 'pick and choose' between the scientific evidence and the evidence provided by fishers. In the end, however, conservation must come first. While for 1999 the Council has recommended an increase in total removals, we continue to be concerned over the long-term well being of this stock if appropriate action is not taken to protect the incoming 1995 and 1996 year classes.

While the Council has recommended a 6,000t TAC for this fishery for 1999, we continue to be concerned with the current depressed state of the stock and the possibility of decline. **Therefore, we feel that no major changes in the TAC are likely to occur in the near future.**

4RS3PN COD

It is clear from the SSR and the views of stakeholders during consultations that there are positive trends in this stock. However, while fishers were unanimous in their belief that the stock could support a TAC of 10,000t in 1999, the Council prefers to be more precautionary. There is near universal agreement among scientists and fishers that this stock is still at low levels compared to the historic levels and stock potential. During consultations it was made clear to Council members that, for a number of reasons, fishers believe the biomass level is somewhat higher than that suggested by the SSR. Nevertheless, in the Council's view, key rebuilding indicators remain depressed.

As with the 4TVn cod stock, it is difficult for Council to 'pick and choose' between the input from DFO scientists and that from stakeholders. The Council has therefore taken more of a middle road and recommended a TAC of 7,500t. However, fishing cannot be concentrated on the 1993-year class and **effective** conservation measures must be put in place and rigorously adhered to if we want to see the biomass continue to improve.

The Council believes that a slight increase in the TAC this year is warranted but wishes to emphasize that the

conduct of the fishery will have a significant impact on what the health of the stock will be next year.

2J3KL COD

The 2J3KL cod stock was assessed at the Zonal Cod Assessment held in Rimouski March 1-12, 1999. At that time, Dr. George Winters, under contract with the Fisheries, Food and Allied Workers Union (FFAW) in Newfoundland, presented a paper that indicated a much more optimistic view of the stock than that which was finally adopted by the other scientific participants of the session. Dr. Winters subsequently presented his findings at a number of the consultations with stakeholders, which has raised the expectations of many fishers for a much-expanded fishery.

Unfortunately, Dr. Winters' analysis did not receive full and proper peer review at the March 1-12 session. Shortly after the Council held public consultations on this stock the Minister requested that the Council delay any recommendations on 2J3KL cod until after a panel of outside experts has had an opportunity to review Dr. Winters analysis.

Therefore, our current report will not contain any recommendations regarding a TAC level or other management measures for any fishery in 1999. Those recommendations will come at a later time following the panel's review. However, the Council believes it important to make a number of observations and recommendations on this stock even in the absence of any overall quota or TAC.

The Council has noted that more and more fishers are becoming involved with DFO Science in a number of programs that greatly assist in providing information that is proving valuable for assessment purposes. One of these programs is the Sentinel Fisheries Program. The Council firmly believes that not only is it important to continue this program in the 2J3KL area but also that **it should begin immediately** and involve the tagging of fish as well. We cannot wait until decisions are made later in the year on possible levels of catch in any limited commercial fishery or expanded index fishery. The collection of information needed for inclusion in future scientific assessments must begin now.

The Council is also struck by the difficulty to date in determining whether or not there is a separate inshore biomass and the level of such biomass. Work on this front should begin as soon as possible and should include acoustic surveys. The Council believes that acoustic surveys can add valuable information, not just for this stock, but in other areas as well and encourages

the Department to make more use of such surveys. Fishers see increasing amounts of fish in inshore bays and are finding it harder and harder to accept the standard view of only one stock biomass. There must be a way of determining if there is a separate inshore biomass, and if so at what level it is. The necessary work must begin immediately on this problem.

The third concern of the Council relates to the possible bycatch of 2J3KL cod in the burgeoning shrimp fishery, particularly in Division 3K. It is imperative that the shrimp fishery be monitored closely for bycatch, particularly in the Hawke Channel.

Although the Council is not in a position to recommend any overall quota or TAC or specific conservation measures for 2J3KL at this time, it nevertheless makes the following recommendations:

1. **The sentinel program in 2J3KL begin as soon as possible, and not wait for future decisions on overall quota or TAC levels, and that it contain a tagging component;**
2. **Consideration be given to introducing acoustic survey work into the traditional survey program to assist in determining whether or not there is a separate inshore component to the stock, and if so, the level of such biomass; and,**
3. **The shrimp fishery in 3K be closely monitored for bycatch, especially in the Hawke Channel.**

3Ps COD

In November 1998 the Council made some recommendations regarding this stock including an interim TAC level while awaiting results of the 1999 assessment which was to be determined during the Zonal Assessment Process in March 1999.

In our report on conservation requirements for groundfish stocks in 1998 and in our report for conservation requirements for 1997, *Building the Bridge*, the FRCC recommended to the Minister that measures be taken to reasonably spread the effort for the 3Ps cod stock over the period of the fishing year to minimize impact on stock sub-components. Therefore, in November 1998 the Council recommended an interim TAC of 6,700t be put in place for the first four months of 1999 so that a fishery could begin in January and not have the entire final TAC caught in only the latter part of the year.

The Council wishes to register its disappointment that its recommendation in this regard, which was intended

to spread the 3Ps cod catches over time and area has not been effectively implemented. Although fishing by some fleets began in January, the majority of the fleets have either recently begun their fishery or are just about to begin.

The Council firmly believes that this is one stock that continues to improve and some believe that it has rebuilt. The Council is of the view that the stock has rebuilt to its current level primarily because the 1989 and 1990 year classes have been protected. Unfortunately, information has been provided that indicates some fishers are increasing their mesh sizes (gillnets) in order to target these larger fish. The Council is gravely concerned over this turn of events and firmly believes that these larger fish must be protected. The current rebuilding of this stock has been dependent on the survival and spawning success of the abundant 1989 and 1990 year classes. Consequently the Council has recommended that immediate measures be implemented to restrict the ability of fishers to target these fish. Should adequate measures not be put in place, the Council is of the view that in future this stock may not be as robust as it appears to be now.

Throughout our consultations this year, as in past years, many stakeholders have expressed concern over the mixing of stocks. Although there has been considerable concern over the mixing of the 4RS3Pn cod stock in 3Ps during the winter months, there is also considerable mixing of 3Ps cod into Division 3L. In the past the Council has recommended, and the Department has implemented, the necessary closed time during the winter months on Burgeo Bank to protect the 4RS3Pn cod. However, work needs to be undertaken to assess the extent of the mixing of 3Ps cod in 3L.

It is recommended that:

1. **The necessary work be undertaken to determine the extent of the mixing of 3Ps cod in Division 3L and the time of year such mixing is most prevalent**

4RST ATLANTIC HALIBUT

Although the Council continues to recommend that any halibut less than 81 cm be released, there is growing concern that this may no longer be an appropriate conservation measure. At the time the measure was first put in place, it was estimated that 80% of the released fish survived. Recent studies, however, indicate that perhaps only 30% survive. There is also believed to be a wide range of survival rates depending

on the gear being used and how the caught fish are subsequently handled.

Before any change is made to the existing measure, there needs to be a careful study undertaken on survival rates including any differences between different gear types.

GROUND FISH CONSERVATION FRAMEWORK

In the Chairman's Report contained in our 1998 Annual Report, *Conservation Must Be Compulsory, Not Optional* (May 1998 - FRCC.98.R.2), we emphasized that Council's 1997 report - *The Groundfish Conservation Framework for Atlantic Canada* (July 1997 - FRCC.97.R.3) should be accepted as the minimal requirements for a sustainable fishery.

We cannot emphasize enough the necessity to base the foundation of our groundfish fishery on the Council's Conservation Framework. To put conservation anything but as the number one priority is to give up all that we have gained, and the sacrifices we have made, over the past few years of moratoria and reduced TACs. The end of income support programs, such as TAGS is putting tremendous pressure on everyone to find enough fish to keep everyone working. The Council has long advocated that there is excess capacity in the groundfish fleet and although there have been attempts to reduce these numbers, such reductions have been minimal in the overall capacity. This is unfortunate as with increasingly good signs in many stocks, there is increasing anticipation by fishers that things will soon be back to normal. **This is not the case.**

As noted in the Chairman's Report, even with strict controls and enforcement the bulk of the 1997 3Ps cod was caught in less than six days and the mentality was clearly one that focused on a race for fish. Even though in 1998 there was a much more controlled fishery, Council is still concerned about the reported highgrading and dumping in 1998. Conservation and maximizing the benefits of the resource should come first.

We would like to think that attitudes have changed. We would like to think that all stakeholders have embraced the need for conservation. But we do not believe this to be the case. However, we are confident that enough have seen the errors of the old ways. We are confident that the recommended catch levels we have recommended for the stocks contained in this report are sustainable, **but only if the Department and industry embraces the types of conservation measures**

outlined in our conservation framework document.

To merely pay lip service to conservation will very quickly lead our stocks back into trouble. And, who will we blame this time?

SENTINEL SURVEYS

Since the Council first recommended that Sentinel Survey Programs be set up in areas where moratoria were in place, the information gathered by this program has begun to pay off. The information is becoming another valuable piece of the puzzle used by scientists in their assessment of stocks.

The Council firmly believes that Sentinel Surveys be maintained.

TAGGING PROGRAM

Over the past two or three years, stock identification and migratory movements of fish have been a serious concern, especially in 3Ps, 4RS3Pn and 4TVn. In 1998, our Science Priorities Letter to the Minister of Fisheries & Oceans recommended that a major tagging program, using the most appropriate mix of technologies, be implemented on cod stocks as soon as the summer of 1998 to help clarify exchanges between stock management units. The letter went on to suggest that 1998 should become known as "The Year of Tagging Programs".

While tagging of fish was carried out in 1998, the Council believes that **the program should become a higher priority and implemented immediately in all these stock areas.**

COD GROW-OUT

With continuing limited resources available, the idea of cod grow-out is worthy of mention and should be encouraged.

RECREATIONAL AND FOOD FISHERIES

The Council has previously recommended that where moratoria exist, there be no recreational or food fishery. **The Council wishes to reiterate this recommendation.** What we have heard through consultations is that these types of fisheries have been ongoing and in most cases with very little, if any, control.

If there is to be recreational or food fisheries in any area, then they must be controlled. In this regard, we wish to repeat our recommendation from 1998:

The FRCC again recommends that in areas where moratoria exist there be no recreational or food fisheries.

We further recommend that in areas where limited fishing is permitted the recreational or food fishery be limited to a certain “season” such as one day per week for three weeks, or one weekend per year. In the case of tour boat operators, the FRCC recommends that they be licensed by the Department of Fisheries and Oceans and this licensing system must be strictly enforced. This licensing system be vigorous enough to separate legitimate operators from those who wish to use this tourist fishery as a disguise to continue commercial fishing. Operators should have to abide by strict Conservation Harvesting Plans, fill out mandatory logbooks, adopt a system of maximum number of tags per season, and the number of cod per person should be reduced from ten to two. If these measures cannot be adopted for the 1999 fishing season the FRCC recommends that there be no tour boat fishery for 1999 in areas where moratoria exist.

It must be emphasized that no fishery, whether commercial or recreation, be permitted to proceed unless proper monitoring systems are in place. At the end of the day, we must know what the total removals have been.

FOLLOW-UP TO RECOMMENDATIONS

Each year the Council makes numerous recommendations to the Minister on TACs and other conservation measures for groundfish stocks. Generally, the Minister responds fairly quickly, and publicly, on his decision for TACs. Unfortunately he rarely provides the Council or the public with his views on the Council’s other conservation recommendations, which most of the time are just as important, and in some cases more so, than the TAC itself. It has generally been left to the Department, either unilaterally or in partnership with industry, to decide whether or not to adopt these other recommendations and how to implement them.

During the most recent round of consultations with stakeholders, Council members heard concerns expressed, particularly in Port Hawkesbury, regarding this lack of any public statement from the Minister indicating whether or not he has accepted any of the other specific recommendations. Fishers complained that in many instances the Council’s recommendations were open to interpretation by fisheries managers and in some instances were applied differently by managers

in different Regions. The Council shares these frustrations and agrees that the process needs change.

Aside from specific TAC recommendations, the Council makes recommendations regarding the management of the fishery on issues such as improved mesh size, closures, protection of spawning areas, etc. It also makes recommendations respecting the need for scientific work on specific stocks. Council members understand that the Minister cannot respond to these types of recommendations as quickly as he does with the TAC recommendations. Nevertheless, it is becoming increasingly important that a formal public response be given as soon as possible to these other recommendations. Whether or not the Minister, or the Department, accepts those Council recommendations regarding management of the fishery should be known before the fishery begins.

The Council recommends that the Minister of Fisheries and Oceans respond publicly to all its recommendations within a reasonable timeframe. If he chooses not to accept any recommendation, the rationale for not accepting the recommendation should be provided to Council and industry.

CHAPTER 2: SEALS

The mandate of the FRCC stipulates that “the Council may recommend any measures considered necessary and appropriate for conservation purposes...”. These include rebuilding groundfish stocks that have been seriously depleted to allow strong, sustained production of young fish.

The burgeoning size of the seal herds and their expanding range throughout the Atlantic zone has resulted in an increased population that exceeds historical levels¹. These populations of harp, grey, and hooded seals together kill more cod from Canadian stocks north of Halifax than any other known factor. In the meantime, cod stocks in the Northwest Atlantic, after more than 6 years of moratoria, have been declared “vulnerable” by COSEWIC.

As demonstrated in recent assessments of cod stocks such as in the Northern Gulf of St. Lawrence (4RS3Pn cod²), and on the Scotian Shelf (4VsW cod³) the seal herds consume tens of millions of juvenile cod and millions more of adult spawning cod. Seals are indisputably a key factor in reducing the recruitment of cod to the fishery. As well, we note that the single cod stock in the Northwest Atlantic considered recovered, namely, the southern Newfoundland/St. Pierre Bank stock (3Ps cod), is the only stock that does not have a large number of seals occurring within its stock range. The accumulated evidence from scientific assessments, as well as the consistent, continual, and corroborating information from fishermen throughout Atlantic Canada is such that the FRCC is convinced beyond any reasonable doubt that the conservation of groundfish stocks, most notably cod, will continue to be jeopardized if the seal herds remain at their current levels.

Given that the seal herds are now at or near carrying capacity⁴, and based on current and historical data, the seal herds can be sustainable at a reduced population level. In applying the precautionary approach to groundfish management, action must be taken immediately in order to improve opportunities for the conservation and recovery of cod and other groundfish stocks, without waiting for absolute scientific proof of the effects of seal predation. As a guideline for the preparation of seal harvest precautionary management plans, **we strongly suggest that the seal herds be reduced by up to 50% of their current population levels.** Reductions should be studied intensively to monitor their impacts and form a basis for adaptive management.

To this end, the FRCC makes the following series of recommendations that pertain to: (1) general aspects in the reduction of the seal herds in the Northwest Atlantic, and (2) specific applications directed at protecting fish stocks in particular areas of the zone.

A. PRINCIPAL RECOMMENDATION

- I. **Reduce the seal herds by up to 50% of their current population levels in specific areas and use such reductions as a basis for scientific study and adaptive management.**

B. GENERAL RECOMMENDATIONS

- II. **Commit new resources toward coordinating seal harvest management plans, and the strict monitoring, control and enforcement of appropriate regulations in the harvest of seals including utilization of carcasses, humane harvests, and minimization of the incidences of struck and lost.**
- III. **Establish a Northwest Atlantic Working Group and Coordinating team responsible for: (1) the organization and development of strategies for immediate seal reduction effort; (2) promotion of humane harvesting techniques; and, (3) other activities as deemed appropriate.**

C. SPECIFIC RECOMMENDATIONS

- IV. **Establish an experimental seal harvest for grey seals on Sable Island for the collection of scientific data and industry development activities. This experimental fishery should not exceed the current annual replacement value estimate of 20,000 Sable Island seals.**
- V. **Define a limited number of experimental seal exclusion zones in each of the 2J3KL (Northern cod) fishery, the 4TVn (southern Gulf of St. Lawrence cod) fishery, and the 4RS3Pn (northern Gulf cod) fishery for the purpose of preventing the expansion of seals into the fishery, designated bay, or area. This measure is designed to protect spawning and juvenile cod concentrations and prevent seals from inflicting high mortality**

**on localized coastal aggregations of cod on
which limited fisheries are being carried out.**

1 Stenson, G., Healy, B., Shelton, P.A., Sjare, B. 1999. Recent Trends in the Population of Northwest Atlantic Harp Seals, *Phoca groenlandica*. DFO Working Paper; Lesage, V., and Hammill, M. 1998. The status of the grey seal (*halichoerus grypus*) in the Northwest Atlantic. DFO Report to COSEWIC.

2 DFO. 1999. Cod in the Northern Gulf of St. Lawrence. DFO Science Stock Status Report. A4-01(1999).

3 DFO. 1999. Cod on the Scotian Shelf. DFO Science Stock Status Report.

4 Stenson et al, and Lesage and Hammill, Op. Cit.; the stock at carrying capacity, i.e., zero growth, is at higher risk of stock collapse due to habitat sharing and disease outbreaks.

CHAPTER 3:

ENVIRONMENTAL

OVERVIEW

NEWFOUNDLAND AND LABRADOR

Along the Labrador and Newfoundland coasts, air temperatures were warmer than usual throughout 1998 resulting in positive annual anomalies of from 0.4° to 1.0° C. The North Atlantic Oscillation (NAO) index was near normal. The warm air masses of 1998, coupled with a reduction in northwest winds during the winter, caused sea ice on South Labrador and the Newfoundland Shelves to appear late, leave early and be of shorter duration than usual. For the third consecutive year, water temperatures from Labrador to Grand Banks generally showed near or above normal values. At Station 27, off St. John's, the water temperature was near normal.

The warm conditions were also evident from the above normal near bottom temperatures on the Grand Banks during the spring and on the northern Newfoundland Shelf during the autumn of 1998. Off southern Newfoundland water temperatures over much of St. Pierre Bank increased significantly in 1998 to near normal values. This resulted in a dramatic decrease in the amount of bottom covered by temperatures <0°C.

GULF OF ST. LAWRENCE

Air temperature over the Gulf was warmer than normal throughout 1998, particularly in the winter and spring. The highest annual anomaly (1.5°C) within 8 stations around the northwest Atlantic was in the Gulf on the Magdellan Islands. Ice coverage was less extensive than usual in 1998 and of shorter duration.

Despite these milder than normal winter conditions, C.I.L. (Cold Intermediate Layer) minimum temperatures surprisingly cooled in 1998 by 0.3° relative to 1997. No satisfactory explanation has yet been found for this unexpected cooling. Not only did the minimum temperature with C.I.L. decline, but also the C.L.I. thickness and volume both increased in 1998. The 100 - 200 m layer throughout the Gulf remained stable relative to 1997 and was close to the long-term mean.

In the 200 - 300 m layer, a slight warming of 0.2° to 0.3°C was observed in the northwest Gulf and estuary. At the same time, a pulse of colder water has begun to propagate along the Laurentian Channel reaching the

Cabot Strait and dropping temperatures by 0.7°C. Dissolved oxygen concentrations were normal in Cabot Strait, but were 2% of oxygen saturation levels below normal in the Honguedo Strait. A stratification index of the upper layer (0 - 30 m as well as 0 - 50 m) shows similar overall values in the 1997 and 1998 groundfish surveys.

There were differences however. The 1998 waters were more stratified than in 1997 in the Estuary and in the northwest Gulf as well as in the Cabot Strait area. On the other hand, the surface was less stratified in 1998 than in 1997 over the Magdellan shallows and north-east Gulf.

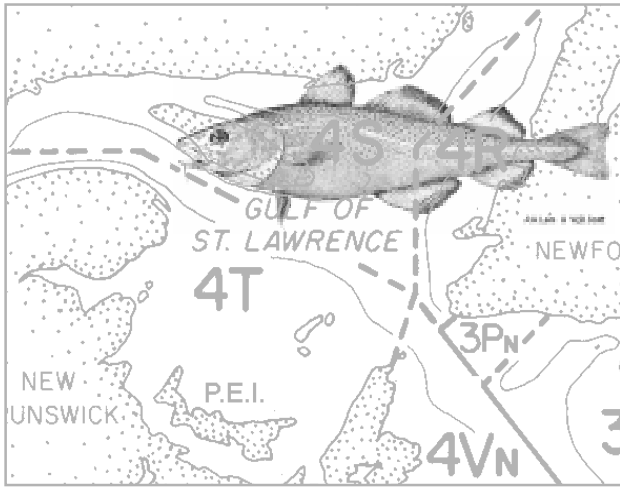
In summary, air temperatures over most of the north-west Atlantic were above normal continuing the warming trend of the past 2 years. Indeed, from the Labrador coast through Newfoundland and the Gulf of St. Lawrence, to the Atlantic seaboard south to the Middle Atlantic Bight, 1998 ranked within the top 5 - 15% of the warmest years on record.

The warmer than normal winter temperatures resulted in less ice than normal off Newfoundland and Labrador and in the Gulf of St. Lawrence. Icebergs were greater in number than the long term average but below the record number of the early 1990s.



CHAPTER 4: GROUND FISH STOCKS OF THE GULF OF ST. LAWRENCE

1. COD 4RS3Pn



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993, the Council recommended, as a precautionary conservation measure, that the 1993 TAC for this stock be reduced from 31,000 t to 18,000 t, the revised F0.1 level for 1993. In the fall of 1993 and 1994, the Council recommended that there be no directed fishing for the 4RS3Pn cod stock in 1994 and that by-catches be kept to the lowest possible level. In addition, the Council recommended for 1995 that there be no recreational/food fishery on this cod stock and that a broad based Sentinel Fisheries program be implemented. In November 1995, the Council reiterated that there was a need to continue the moratorium on commercial fishing, as well as a need to expand the Sentinel Fishery program for this stock.

In October 1996, the FRCC recommended reopening a limited commercial fishery in 1997 with a TAC set at 6,000t. In addition, the Council also recommended that the fishery be closely controlled and monitored.

In 1998, the Council recommended that a TAC of 5,000t be set to allow for a continued limited commercial fishery of this stock, but that fishing be minimized during peak spawning periods and that fishing not be concentrated on the 1993 year-class. The Council also recommended that the winter fishery on Burgeo Bank should be limited to protect 4RS3Pn stock components.

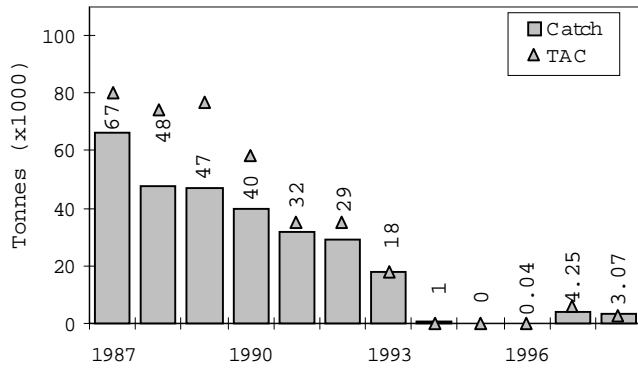
1999 CONSULTATIONS:

Fishermen reported that catch rates in the sentinel fishery are increasing. Good signs of recruitment were indicated in the hook and line fishery. Fishers in Newfoundland proposed to permanently increase the mesh size in gillnets to 6" from 5.5" in 1999 in order to protect the 1993 year class. A subsequent brief from fishers in the lower North Shore indicated that such a change in mesh size may adversely effect their catch rates. Some fishermen indicated that the use of gillnets should be restricted due to the risk of discarding. The distribution of the stock was reported to be expanding as evidenced by increased catch rates in the most northern areas of the Gulf. The Union conducted a telephone survey which indicated that fishers believed the stock was in better overall condition than their view of the resource in the 1992-93 period. Also they viewed the resource as improving from 1997 to 1998. Fishers reported that overall there is less fish than in the early 1980s. Fishers expressed concern as to whether the

RECOMMENDATION #1:

The FRCC recommends that:

- 1.1 the TAC for 1999 be set at 7,500t to allow for a limited commercial fishery in this area;
- 1.2 the same conservation measures that applied as part of the CHP in 1998 apply again in 1999;
- 1.3 mesh size for gillnets be increased to 6 “;
- 1.4 fishing not be concentrated on the 1993 year-class;
- 1.5 fishing be minimized during peak spawning periods and on spawning concentrations;
- 1.6 strict controls continue to apply in both the shrimp and turbot fisheries to avoid by-catch of juvenile cod;
- 1.7 the winter fishery in the Burgeo Bank area should be closed from November 15 to April 15 to protect the 4RS3Pn stock components; and
- 1.8 the tagging program be continued.



*1998 Catch: as of Dec. 2, 98

period of the winter closure around Burgeo Bank was adequate to protect the 4RS3Pn cod stock. The FRCC was complimented on its recognition of seal predation on cod. Fishers were unanimous that a 10,000t TAC was very responsible and would ensure the continued rebuilding.

ANALYSIS:

The 1999 stock status report indicates:

- The lowest adult biomass was observed in 1994 at 17 Kt, it has slowly increased to reach 55 Kt in 1998. Although there is an improvement, this adult biomass is still much lower than the maximum of 348 Kt observed in 1983.
- The 1993 and 1995 year classes are estimated at 129 million individuals at age 3. This value is close to the historical average. These two year classes are the strongest observed in the 8 last years. The majority of the 1993 year class will spawn for the first time in 1999 and the 1995 year class appears as strong but only a small proportion of them will be mature in 1999 at age 4.
- The directed fishery in 1998 produced landings of 3,000 t with a fishing mortality of 0.11. A harvest of more than 10,000 t in 1999 would be likely to reduce mature biomass.
- Mortality caused by factors other than recorded landings was high in the late 1980s and played a role in the stock's collapse. It is very likely that, during the 1990s, this mortality remained at least twice as high as assumed in assessments before 1998.

- The assessment is based on several indices .

The FRCC makes the following observations in relation to this stock:

Mortality on older age groups is high and may reflect seal predation. Current estimates are that seals are consuming annually 80 million fish age 3+ from this stock. A large part of the population is overwintering in Sub-division 3Ps. The area around Burgeo Bank needs to be closed to fishing during this period. There is near universal agreement among scientists, fishers and industry that this stock is still at low levels compared to its historical levels and potential. Hence the goal for this stock is to allow for modest but sustained growth in abundance, distribution and age structure, while encouraging a limited fishery.

The SSR assessments, based on a newly formulated multi-index model, that includes indexes from offshore and inshore, and the impact of seals on cod mortality. This model indicates that a conservative harvest, wherein there is an 80% probability that the SSB will not decline, is consistent with a TAC of 6,000t. However, there is uncertainty in this approach. In particular, the submitted views of industry and fishermen on both sides of the Gulf suggest that this stock is rebuilding faster and is in better condition than suggested by the SSR.

Industry and fishermen generally believe that a TAC of 10,000t is justified and sustainable. In support of this, fishery catch rates have been strong and alternative interpretations of RV surveys and tagging experiments have suggested somewhat higher biomass levels than suggested in the SSR. Nevertheless, key rebuilding indicators remain depressed. In particular, recruitment and the SSB remain low relative to historical averages and distribution, while improving, has not fully expanded to the historic range.

SENTINEL FISHERY:

In 1998, six sentinel surveys were used in the assessment.

The four fixed gear indices showed similar inter-annual patterns for both gillnets and hook and line. The 1998 catch rates for these gears improved in almost all areas.

The sentinel fishery program using mobile gear began in the northern Gulf in 1994, but it was not until 1995 that the entire offshore stock area was covered. These surveys are conducted twice a year (July and October)

using nine trawlers. They carry out stratified random sampling like that done the *Needler*. The gear employed by the nine trawlers was standardized in 1997 by introducing the use of a restrictor cable, which keeps the size of the trawl opening constant throughout fishing operations.

The July abundance index doubled between 1995 and 1997, but remained low in absolute terms. The population abundance estimate declined slightly between 1997 and 1998 for the July surveys. However, the 1995 year class at age three is the most important in the time series. The October index rose between 1995 and 1996, but declined in 1997. The index of the 1998 October sentinel survey is the highest in the time series exceeding slightly the 1996 and 1997 surveys. The major part of the biomass is located in Division 4R. The distribution of cod does not vary significantly between July and October.

The 1993 year class dominated catches during the last five surveys, from age two in 1995 to age four in 1997. However, the 1995 year class was the most abundant in both 1998 mobile gear sentinel surveys at age 3.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: stock status improving with extended geographical distribution in coastal areas

Compared to average

Overall biomass: lower than average

Spawning biomass: lower than average but increasing

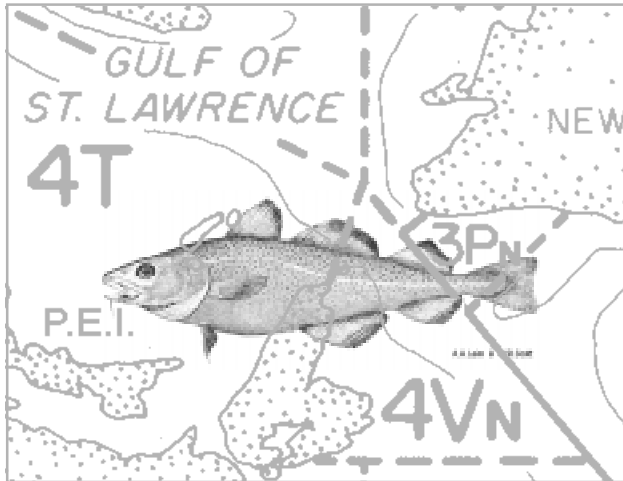
Recruitment: near average 1993 and 1995 year-classes; weak 1994 year-class

Growth and condition: growth improving; condition stable

Age structure:

Recent exploitation level: fishery closed 1994-96, 1997 catch of 4,400t, 1998 catch of 3029t

2. COD 4TVN



HISTORY OF FRCC

RECOMMENDATIONS:

In 1993, due to the dramatic decline in all of the indicators for this cod stock and the poor recruitment prospects, the Council recommended that this fishery be closed at least until June 1994. The fishery was then closed by DFO. Taking a cautious approach, the Council recommended in November 1994 that no directed fishing take place on this stock in 1995. In 1995, as prospects for recovery continued to be bleak, the Council recommended for 1996 that the morato-

rium on commercial fishing be continued. However, the Council estimated that the stock could sustain a 4,000t catch and that this value could be used as an upset limit for an enlarged Sentinel fishery. In 1996, the calculated spawning biomass (age 5+) was estimated by DFO to be around 110,000t improving but still below the values observed in the mid-eighties when at that time the spawning biomass was estimated to be twice as much. The Council recommended for 1997 a limited reopening of the commercial fishery with a TAC of 6,000t. DFO decided not to follow the FRCCs recommendation. Instead, the sentinel fishery was expanded and experimental projects were established.

In March 1998, the FRCC recommended that there be no directed commercial fishery for this stock, and that total removals in the index and sentinel fisheries as well as by-catches not exceed 3,000t.

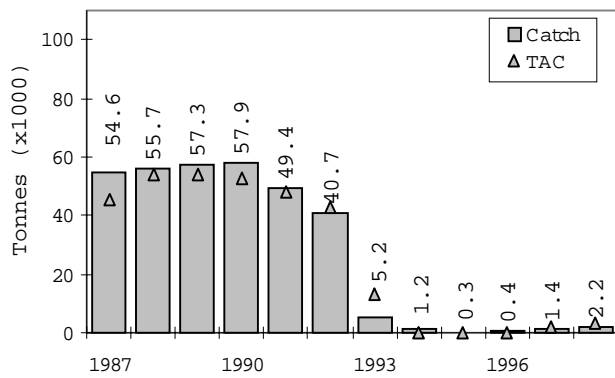
1999 CONSULTATIONS:

A document was presented in Gaspé by the coalition "MORUE", regrouping fixed and mobile gear fishers as well as academic institutions and social groups. The document explains the current poor situation of Quebec fishing industry since the closures. The document raises doubts about the scientific assessment, pointing out apparent inconsistencies and discrepancies with

RECOMMENDATION #2:

The FRCC recommends that:

- 2.1 the stock be reopened for a commercial fishery;
- 2.2 the TAC be set at 6,000t;
- 2.3 science and industry work together to begin a standardized catch rate time series, in order to build a reliable database;
- 2.4 actions be taken to protect the 1995 and the 1996 incoming year classes;
- 2.5 fishing on spawning concentrations be minimal;
- 2.6 the fishery be subject to 100% dock side monitoring;
- 2.7 any fishing on the 4T-4Vn cod stock during its over-wintering in 4Vn area should only take place to the extent that there is a high confidence that catch of 4Vn resident stock be minimal. The Department of Fisheries and Oceans is encouraged to research the conditions by which this might be achieved; and
- 2.8 the sentinel fishery be pursued, and a protocol to monitor the recruitment in the inshore areas be implemented as a part of it.



* 1998 Catch: as of Dec. 2, 98

fishers' observations. The group feels that a new type of cooperation is needed between science and industry. The coalition feels that the fishery should be reopened in 1999 and a TAC of about 10% of the calculated biomass (i.e. 9,000t) is realistic and would not prevent the recovery of the stock. The fishery should be well controlled and monitored. It was said, during consultations that the present geographical distribution is not an indication of stock abundance as it may be due to normal cycles or to environmental conditions. Some concerns were raised regarding the too numerous conservation measures that prevent the "normal" prosecution of fisheries.

The same views about the stock status and the recommended TAC were shared by the mobile fishers in the Magdalen Islands. It was added that the numerous types of fisheries (i.e. sentinel, index, recreational) become confusing and that it would be better to consolidate them in a single true commercial fishery (it was felt that it is better to have a controlled open fishery than an uncontrolled closed fishery). The mobile fleet activity has changed, having been severely reduced and using more selective gears: it is acting now in more of a conservation manner and is certainly not as destructive as in the past. It was also recommended that the FRCC should have a global perspective; should be consistent across areas and should not step into gear conflicts. In Québec, fishers expressed a great concern about the respect of their historical share.

The Association des pêcheurs de poisson de fond acadiens presented a calculation derived from Science data and argued that the biomass has increased much more than described by the SSR and that a TAC of 9,000t would still allow a significant increase. The proposal was to implement a well controlled and monitored commercial fishery with an interim quota of 6,000t, with a mid-season review based on catch rates that could allow an extra 3,000t TAC. A suggestion was made that the stock could be made of two compo-

nents, one moving west south along Prince Edward Island shore and the other moving west through a more northern route: the first one would have recovered while the second one would remain in bad shape.

In Cape-Breton, fishers felt that the stock could sustain a 6,000t commercial fishery. As in other areas, fishers reported large amounts of cod that prevent the normal fishing activities on other stocks. Unusual, historically high, by-catches are reported in lobster traps.

A common view is that the index fishery, as prosecuted in 1998, is no more acceptable as it is seen as a disguised commercial fishery as it was unable to provide the expected data.

Different views of the stock status was expressed by fixed gear fishers. No cod is showing up around the Gaspésie coast line and traditional fishing grounds east of Gaspé are still empty of cod. Fixed gear fishers groups generally feel that the cod stock is still in poor shape and that we should move very cautiously, with a different more ecological approach (i.e. using fixed gear only). The catch limit should be kept at 3,000t, and should certainly not exceed 5,000t.

A general feeling was that the sentinel fishery provides useful information and that the time series should be continued.

ANALYSIS:

The 1999 Stock Status Report indicates that:

- The closure of the cod fishery in the southern Gulf of St. Lawrence in September 1993 stopped the rapid decline in abundance and biomass of the stock. Since the fishery closure in 1993, the stock has remained low.
- The recruitment produced in the early 1990s has been well below the historical average. However, there are now indications that recruitment is improving; the 1996 year-class is about average.
- Estimates of total mortality from research and sentinel surveys indicate that the natural mortality rate of this stock remains higher than the historical estimate of 0.2. Natural mortality is estimated to be in the range of 0.4 to 0.5.
- The geographical distribution is still a concern as about 45 % of the stock is now concentrated east of Magdalen Islands, compared to 10 to 25% in the seventies.



- Stock projections indicate a 5 to 6% expected improvement in spawning stock biomass in 1999 if there is no fishing.
- The spawning stock biomass could increase by 10% in 2001 provided that the 1996 year-class continues to be about average and catches in 1999 and 2000 are near the 1998 level.

The FRCC notes that the scientific assessment in 1999 is showing more positive signs than in the previous year. The prospect of a stock biomass increase exists. The year classes born in 1995 and, especially, in 1996 are stronger and near the level of the long term annual average recruitment. The Council feels strongly that those classes should be protected as they will contribute to the recovery of the stocks. The FRCC remains concerned about the very low abundance of the 1994 year class that will have a significant effect in 1999. The FRCC tries to reconcile the scientific views, showing a marginal increase of the spawning stock biomass in 1998, as in the previous years, and the perception of the fishing industry, which provides non quantitative but somewhat convincing evidence of a larger amount of fish. It is recognized that the stock status has not yet recovered, however it is recognized that some room exists to increase the catch level. According to the SSR, a catch of 6,000t would maintain the stock at its current level. Some members of the fishing industry feels that a catch up to 9,000t will not prevent an increase in the spawning stock biomass. The FRCC also considers that the biomass remains at a low level and that its increasing rate remains low as well, due to the current low productivity of the stock. The FRCC accepts that the catch level may be increased but considers that a cautious approach is still needed and should be maintained. The Council feels that a TAC of 6,000t can be accepted, as it represents the maximum acceptable level according to the scientific assessment, while permitting the orderly prosecution of a limited commercial fishery. The FRCC recognizes the current depressed level of the stock and the possibility of decline. It feels that no major changes of the TAC are likely to occur in the near future.

As a general approach, the FRCC is concerned about fishing on concentrations that are comprised of more than one stock, particularly when one of those stocks is a relatively depressed state. This concern applies clearly to the winter fishery in the 4Vn area, as a fishery may then capture a significant amount of the local resident stock, which is in a collapsed state.

SENTINEL FISHERY:

The sentinel fishery was implemented in 1994. It was carried on in 1998 with the same protocol as in 1997, using longlines, trawls and seines (mobile gear with and without a liner in the codend in order to get recruitment indices). A total of 630t were caught in 1998 from 539t in 1997. Overall, few changes are noticed since the previous years. Standardized longlines catch rates declined in 1998, with an average value close to the 1995 one, while mobile gears without a liner (seine and trawl) catch rates increased slightly. That increase is considered to be due to the growth of older animals that provide higher catch rates in weight compared to numbers. The geographical distribution provided by the sentinel survey was similar to previous years and to the scientific survey: fish was scarce along Gaspé area, and the abundance was significantly lower in the western part of the Gulf than in the eastern part, especially between Prince Edward

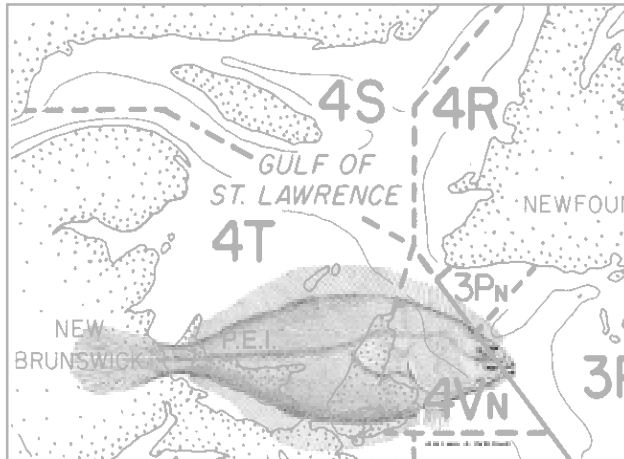
COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	stock is stable but at a very low level <i>Compared to average</i>
Overall biomass:	the total number of fish has increased by 14% between 1998 and 1999, but remains below long term average
Spawning stock biomass:	stable at low level but extremely fragile to increased natural mortality; growth, not recruitment, maintaining stability
Recruitment:	below average
Growth and condition:	fish improving in weight at age from very low levels and its physical condition remains stable with respect to 1996
Age structure:	affected by poor recruitment
Distribution:	below average
Exploitation level:	no directed commercial fishery since 1993

Island and Cape Breton. Size frequency distributions show that the 1993 and 1994 year classes are poor while and that 1995 and 1996 year classes appear to be more abundant, which is consistent with the scientific survey.

In 1998, an index fishery program was implemented, following the FRCC's recommendations. This program intended to simulate commercial fisheries, with a minimal quota and under strict supervision, and was expected to provide additional information on stock abundance, on geographical distribution and on juvenile distribution and abundance. About 1221t were caught out of that fishery. While the information may be considered useful as a complement, the informative value is questioned compared to other programs. This may be due to the late departure of the program but also to other factors. For instance, most of the activities took place on high density locations, which does not add to the current knowledge. Scientists, managers and fishers remain skeptical about the interest of such a program in comparison of other programs.

3. AMERICAN PLAICE 4T



In 1998 the Council recommended the TAC for this stock be lowered to 1,500t, and that mandatory hailing system and dockside monitoring be maintained. The Council further recommended that DFO convene discussions with industry to ensure no increased effort in eastern 4T from 1997 levels, to explore an increase in the minimum mesh size to optimal levels for all gears, to establish the use of indexed vessels, to establish proper CPUE indices for future stock evaluation, and to launch a joint DFO/Industry research survey using commercial vessel(s). It was further recommended that DFO establish measures to ensure that effort was reasonably dispersed and not concentrated on stock components.

HISTORY OF RECOMMENDATIONS:

The Council recommended the TAC of 5,000t in each of 1994 and 1995, and measures to protect small fish. For 1996, due to indications that the biomass was at the lowest level observed, the Council recommended a reduction in the TAC to 2,000t. It also recommended continuation of efforts to minimize the capture and discarding of small fish. For 1997, based on fishers' observations of higher catch rates despite the use of larger mesh size off eastern P.E.I., and in consideration that 1996 fall survey was similar to that undertaken in 1995, the Council recommended an increase in the TAC to 2,500t. The Council reiterated its call to strictly enforce size limits and also recommended that measures be taken to limit the redirection of effort from other fisheries.

1999 CONSULTATIONS:

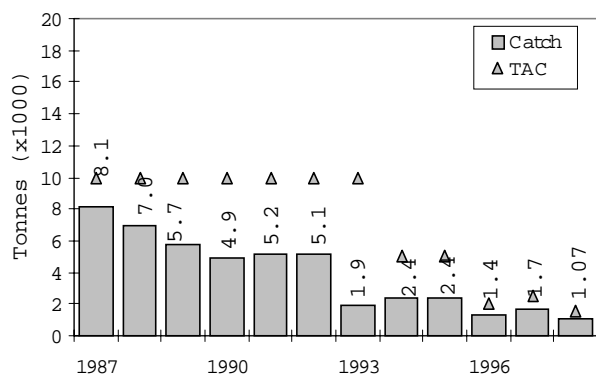
Most of the comments came from the consultations in Port Hawkesbury. The major concern is related to the research vessel *Alfred Needler*, which is perceived as inadequate for groundfish surveys, in general, and for flat fish surveys, in particular. Criticism was raised regarding the lack of experience of the crew and the type of bottom trawl being used, that is not suitable for flat fishes. A strong need was expressed for a survey made by a commercial fishing vessel, in parallel to the *Needler's* survey, in order to test the validity of the scientific assessment. A proposal was made for such a survey.

Fishers feel that the stock is in a much better shape as described by the stock status report. High catch rates

RECOMMENDATION #3:

The FRCC recommends that:

- 3.1 the total removals from the stock should be set at 2000t in 1999;
- 3.2 these total removals should be maintained at the current precautionary level in the future until the question of discrepancies between science and industry is resolved;
- 3.3 a research cruise carried out by commercial vessels must be implemented in order to assess the flat fish catchability of the *Needler's* survey. The organization of such a survey should be discussed between science and industry;
- 3.4 research on selectivity should be pursued. Once the selectivity curve is defined, the proper mesh size must be implemented in order to effectively protect the smaller fish;
- 3.5 the amount of fish needed for the survey and for the selectivity research should be taken out of the recommended total removals; and
- 3.6 scientific research be pursued to develop a view of stock migration pattern for this species in and out of the Gulf of St. Lawrence.



*1998 Catch: as of Dec. 2, 98

are still experienced while the mesh size of the trawls have been voluntarily increased to more than 155mm (sometimes as high as 170mm). Catch rates have increased in some areas. The catch is not reflective of the abundance as numerous closures occurred in the mobile fleet fishery due to the high by catches in the witch flounder fishery. Fishers requested a substantial increase of the TAC varying from 500 to 2,000t.

Concerns were raised in Moncton about the numerous catches of small plaice not suitable for the market, and the present minimal legal size was questioned. The catch of sub-legal sized fish remains an issue and more work on selectivity of gears is requested.

ANALYSIS:

The 1999 update to the Stock Status Report states that:

- Stock abundance and recruitment remain poor.
- Year class remains at a low level.
- The stock is concentrated in eastern 4T, which makes it vulnerable to excessive exploitation.
- Chances for conservation would improve if catches continue to be kept well below the 2,000t level.

The FRCC is not able to reconcile the conflicting views between the scientific assessment, which describes a very bleak situation for the stock, and the industry sector, which feels that the stock is in good health. The negative signals provided by the scientific assessment cannot be ignored. However, the FRCC feels that information coming from the industry allow for some increase in the exploitation rate. The issue of the discrepancies between science and industry views must be addressed in order to provide a widely accepted perception of the stock status. Unless this issue is resolved, it is unlikely that the FRCC will be in a position to recommend any further changes in the near future.

The Council remains concerned about the catch of under-sized fish.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator: population abundance remains low and recruitment remains poor; decline arrested in 1998 ; may be improving according to the fishing industry

Compare to average

Overall biomass: Still well below long term average, slight improvement in 1998 after 20 years of constant decline since the late 1970s highs (however abundance is the second lowest in the trawl survey time series); different views are expressed by the fishing industry

Spawning biomass: cannot be quantified

Recruitment: still well below average as indicated by the number of fish smaller than commercial size in the scientific survey

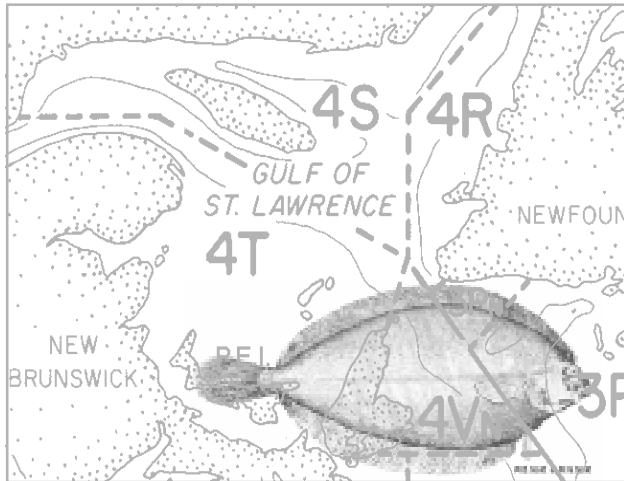
Growth and condition: no indication; discards of under-sized fish remains a concern

Age structure: no indication

Distribution: abundance remains stable in the eastern part of the Gulf of St. Lawrence; constant decline in the western part

Recent exploitation level: 1998 catch at 1100t from a TAC of 1500t; by-catches of other species limited landings

4. WITCH FLOUNDER 4RST



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that the TAC for the stock unit 4RS in 1994 be set at 1,000t as a pre-cautionary measure, and that, pending clarification of stock boundaries, catches of witch flounder in 4T be monitored closely. For 1995, the Council recommended that the stock unit for this species be amended to include 4T, and that the TAC be set at 1,000t for this expanded area in 1995. In its reports for 1996 and 1997, Council recommended that the TAC of 1,000t for 4RST witch be maintained. All of these TAC recommendations were implemented as stated.

For 1997, the FRCC also recommended that measures be taken to harmonize mesh sizes used for this species over the entire stock area.

The Council recommended in 1998, that the TAC for this stock be lowered to 800t to guard against further declines and enhance prospects of re-building. It was also recommended that information available concerning spawning times and areas for this stock be compiled and assessed, with a view to introducing protective measures. An increase in mesh size was recommended.

1999 CONSULTATIONS:

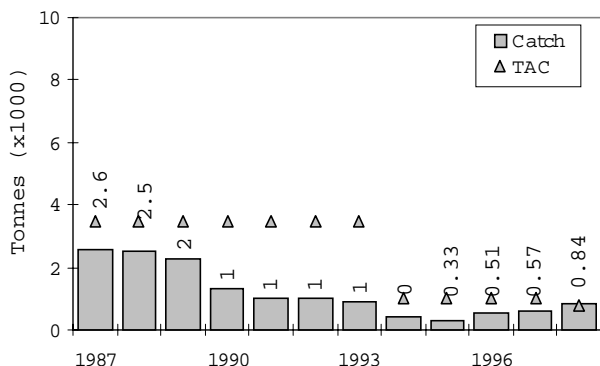
Most comments came from the Port Hawkesbury consultations. The major concern was related to the research vessel *Alfred Needler*, which is perceived as inadequate for groundfish surveys, in general, and for flat fish surveys, in particular. Criticism was raised regarding the lack of experience of the crew and the type of bottom trawl being used, that is not suitable for flat fishes. A strong need was expressed for a survey made by a commercial fishing vessel, in parallel to the Needler's survey, in order to test the validity of the scientific assessment. A proposal was made for such a survey.

Considering the stock status, fishers felt that the stock is improving. High catch rates were experienced.

RECOMMENDATION #4:

The FRCC recommends that:

- 4.1 the total removals for 1999 be maintained at 800t;
- 4.2 these total removals be maintained in the future until the question of discrepancies between science and industry is resolved;
- 4.3 a research cruise carried on by commercial vessels should be implemented in order to assess the flat fish catchability of the Needler's survey. The organisation of such a survey should be discussed between science and industry;
- 4.4 research on selectivity should be pursued. Once the selectivity curve is defined, the proper mesh size must be implemented in order to effectively protect the smaller fish;
- 4.5 the amount of fishes needed for the survey and for the selectivity research be taken out of the recommended total removals; and
- 4.6 scientific research be pursued to develop a view of stock migration pattern for this species in and out of the gulf of St. Lawrence.



*1998 Catch: as of Dec 2, 98

Significant abundance of witch flounder was also reported along the eastern shore of Newfoundland. Along Cape Breton coast, the TAC was caught after a short period of time, which prevented the prosecution of the American plaice fishery at the end of the season. A TAC between 1000 to 1200t was recommended.

Concerns were raised about new fishers, with no history in the fishery, beginning to direct for witch flounder.

ANALYSIS:

The 1999 update to the DFO Stock Status Report indicates that;

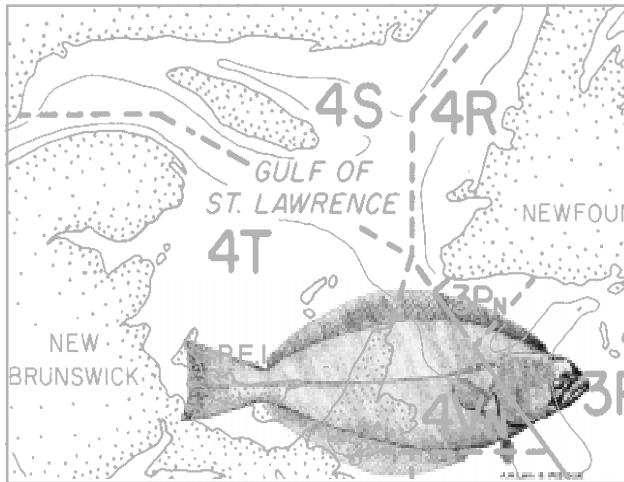
- Although relatively abundant in eastern 4T, biomass as a whole has been at a low level since 1993.
- Recruitment has remained fairly constant throughout 1990s (except for fluctuations in 1993 and 1994) and has tended to be higher than in the late 1980s.
- Improved recruitment appears to be needed for stock rebuilding.

The FRCC is not able to reconcile the conflicting views between the scientific assessment, which describes a very bleak situation of the stock, and the industry sector, which feels that the stock has improved. The issue of the discrepancies between science and industry views must be addressed in order to provide a widely accepted perception of the stock status. The FRCC, however, feels that the stock remains highly vulnerable and that the positive signs are scarce. The observation that the stock does not show significant signs of recovery while the recruitment is at one of the highest levels ever observed is of great concern. The Council thinks that a strict conservation approach has to be maintained over a certain period of time in order to help to the stock recovery.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	population still at low level and not rebuilding despite high recruitment ; fishing industry indicates improvement
	<i>Compare to average</i>
Overall biomass:	remains at the lowest levels observed
Spawning biomass:	still a low level
Recruitment:	constant throughout the 1990s; higher than in the late 1980s
Growth and condition:	no information
Age structure:	no information
Distribution:	1998 biomass in the eastern 4T exceeded the 1987-1990 average; declined in the western 4T and in 4R and 4S
Recent exploitation levels:	low landings in recent years due to low TAC; TAC exceeded in 1998

5. GREENLAND HALIBUT 4RST



HISTORY OF FRCC

RECOMMENDATIONS:

In 1993 and in 1994, the FRCC recommended the TAC to be set at 4,000t. In 1995, considering the declining abundance, the Council recommended to decrease the TAC to 2,000t, along with measures to allow young fish to mature. The same TAC was set in 1996. In 1997, according to positive indicators regarding the biomass and the recruitment levels, FRCC recommended a raise of the TAC up to 3,000t.

In March 1998, the FRCC recommended that the TAC for this stock be raised to 4,000t, and that measures regarding the protection of juveniles be maintained.

1999 CONSULTATIONS

Fishers reported that in their view the stock was at the long term average. Reported that Nordmore grate in the shrimp fishery had a favourable impact on the turbot resource.

ANALYSIS

The 1999 Stock status report indicates that:

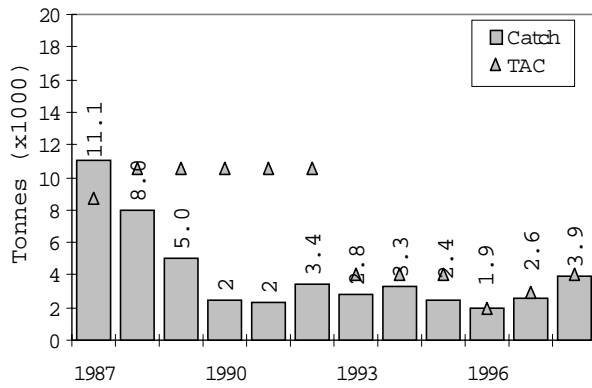
- The catches per unit of effort (CPUEs) of Quebec gillnet fishers increased in 1998 and the summer fishing season was short. In Division 4R, however, the limited information available on catch rates indicates a drop in CPUEs and a slightly longer summer fishing season.
- The biomass index from the DFO's research survey has shown an upward trend since 1990. The highest estimates were recorded in the last three years. The biomass indices of the sentinel fishery surveys conducted in July and October have been rising since 1995.
- The juvenile abundance indices from the research surveys show that the 1995 and 1997 year-classes are the largest since 1990.
- Because of the rapid growth of the 1995 year-class, the average size of these fish will fall slightly below the minimum size limit (44 cm) and may well lead to large catches of fish under 44 cm in 1999.

The FRCC believes that this stock is near its long term average and does not expect the TAC to fluctuate widely in the near future.

RECOMMENDATION #5:

The FRCC recommends that:

- 5.1. the 1999 TAC should be raised to 4500t;
- 5.2. measures regarding the protection of juveniles, such as small fish protocols, mesh-size and Nordmore grate be maintained;
- 5.3. further scientific research be pursued in order to develop a more precise view on stock delineation and migration patterns; and
- 5.4. continue with the 6" mesh size in gillnets uniformly throughout the Gulf.



*1998 Catch: as of Dec 2, 98

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: Stock still rebuilding

Compared to average

Overall biomass: Increasing since 1990

Spawning biomass: unknown

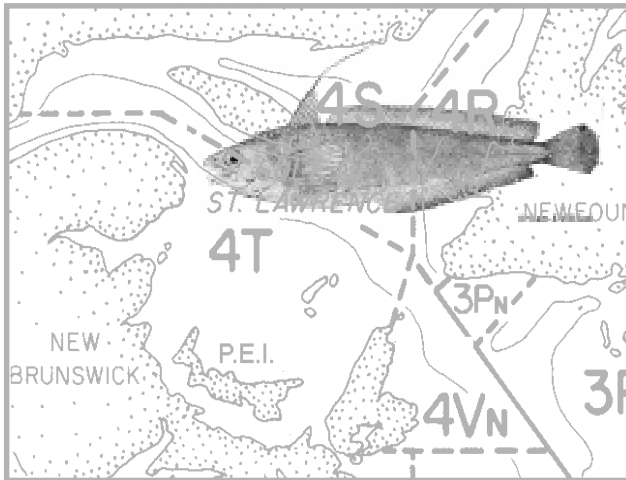
Recruitment: 1995 and 1997 year classes good.

Growth and condition: good

Age structure: improving

Recent exploitation level: unknown

6. WHITE HAKE 4T



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that the TAC be reduced to 2,000t for 1994 as a precautionary measure. Due to the historically high incidence of small fish in the catch, the Council also recommended that the measures introduced in 1993 to protect small fish be continued. It was also recommended that key areas and times of spawning activity for this stock be delineated and that, if feasible, measures be taken to establish closures during spawning areas/periods.

In November 1994, as there was no change in the abundance estimates (which remained at about half the level of 1992), the Council recommended that there be no directed fishing for 4T white hake and that by-catches be kept to the lowest possible level. In 1995, due to continued concerns over low abundance and

with the indications of weak incoming recruitment, the Council recommended a continuation of the moratorium on directed fishing in 1996. For 1997, the Council recommended there be no directed fishing but allowed for a 500t bycatch.

In 1998, the FRCC recommended there be no directed fishing for 4T white hake and that bycatch protocols be applied when prosecuting other fisheries. The Council also recommended that work be undertaken to determine if this is a resident Gulf stock or if this is a component of the Eastern Scotian Shelf stock.

1999 CONSULTATIONS:

Comments came exclusively from the Port Hawkesbury consultation. Fishers experienced very high catch rates in the sentinel fishery taking place in St. Georges Bay. Great concerns are raised regarding the high level of by-catch that limits the other fishing activities in that area. It is felt that the scientific survey cannot properly assess the recruitment of the population. A minimal TAC of 400t for St. Georges Bay is requested in order to allow some directed fishery and the normal prosecution of other fisheries. This fishery would be carried on by longlines only with a maximum of 2000 hooks. A 25% bycatch allowance for mobile fleet was requested.

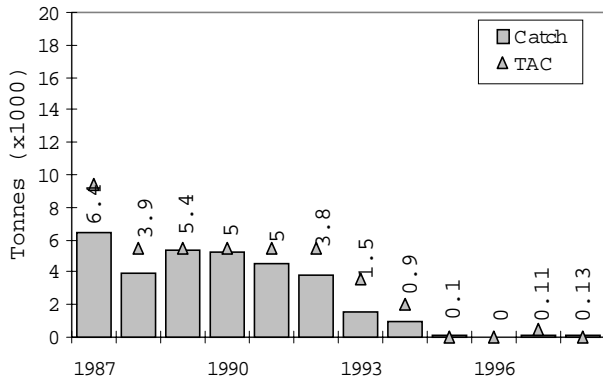
ANALYSIS:

The 1999 update to the Stock Status Report indicates that:

RECOMMENDATION #6:

The FRCC recommends that:

- 6.1 there be no directed fishery for 4T white hake in 1999;
- 6.2 there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of this stock in all fisheries directed towards other species. In addition, consideration should be given by DFO in consultation with industry, to the establishment of incremental conservation measures, including closed areas where higher by-catches are encountered, closed seasons when higher by-catches are encountered,
- 6.3 the substantive by-catch in other fisheries occurring in St. Georges Bay may result in significant white hake mortality and should be avoided; and
- 6.4 work be undertaken to determine if this is a resident Gulf stock or if this is a component of the Eastern Scotian Shelf stock and scientific research be pursued to develop a view of stock migration pattern for this species in and out of the Gulf of St. Lawrence.



*1998 Catch: as of Dec 2/98

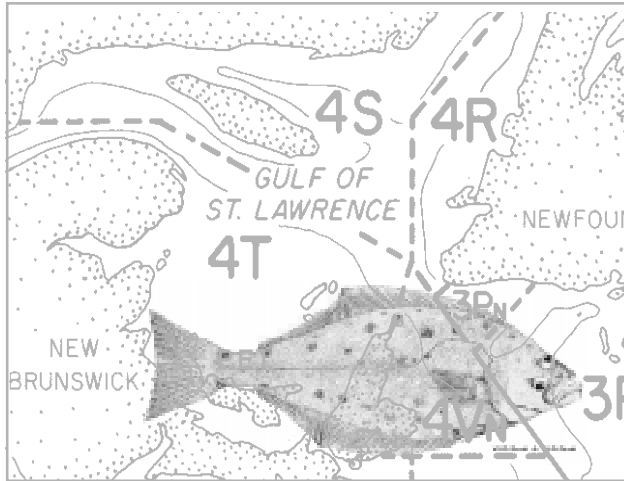
- Resource remains near its lowest level since the first quota was put in place in 1982.
- Mean weight of fish caught per tow (all ages) remains low.
- Abundance of commercial size fish (over 40 cm) remains low.
- Considering the low abundance and indications of weak incoming recruitment over the next couple of years, any recovery of this stock will occur slowly.

The FRCC remains heavily concerned by the status of the resource, which remains at very low levels and which does not show evidence of recruitment. The geographical contraction of the resource in a very small area may be the primary reason for the high catch rates experienced there. The relationship with the stock present in the Eastern Scotian Shelf remains a major issue.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	still in a very depleted state; not likely to recover in the near future <i>Compare to average</i>
Overall biomass:	remains near the lowest historical levels
Spawning biomass:	very low
Recruitment:	young fish abundance well below the numbers observed in 1995 and 1996 surveys
Growth and condition:	no information
Age structure:	contraction of the size structure in 1998 compared to the 1984-1997 average
Distribution:	fish biomass mainly concentrated in St. Georges Bay and along Cape Breton; the question of the links with the population of the northern Scotian Shelf still debated.
Recent exploitation level:	no directed fishery since 1995.

7. ATLANTIC HALIBUT 4RST



HISTORY OF FRCC

RECOMMENDATIONS:

Since 1993, the FRCC has recommended a constant TAC at 300t. In 1995, the Council also recommended that the release of fish of size under 81cm be mandatory.

In 1998, the Council further recommended that landings be properly monitored and small fish protocols be effectively enforced, and measures to protect juvenile halibut and to reduce by-catches be maintained and strictly enforced.

1999 CONSULTATIONS:

Fishermen were tagging halibut. Seems to be many small halibut in certain areas but not many large halibut as in years past.

ANALYSIS:

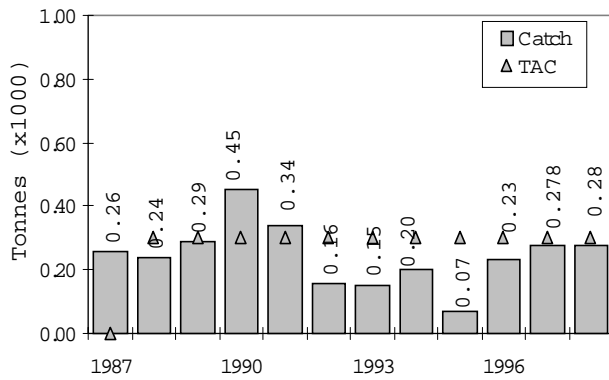
The 1999 Stock Status Report indicates that :

- Since 1996, total landings of Atlantic halibut have more than doubled and are now close to the precautionary TAC of 300 t; however, they are well below the values of 1,000t and over regularly recorded during the first half of the century.
- During the same period, the fixed gear fleet has steadily increased its contribution to total landings, reaching over 99% of the total in 1998. More than 90% of the fixed gear catches are made by longliners.
- The length distributions of fish caught with fixed gear have always been quite broad, compared to those computed for catches made by the mobile gear fleet. Since 1995, this fleet's catches have consisted almost exclusively of individuals under 100 cm in length.

RECOMMENDATION #7:

The FRCC recommends that:

- 7.1. the 1999 TAC be set at 350t;
- 7.2. the release of fish smaller than 81cm be enforced for both commercial and recreational fisheries;
- 7.3. efforts be made immediately to determine the survival rates of 81 cm and smaller fish;
- 7.4. DFO, in conjunction with industry, ensure that the necessary information is recorded in log books so that a CPUE index can be developed and that tagging studies as well as research surveys be implemented so as to gain a better understanding of the status of this stock ;
- 7.5. measures to protect juvenile halibut and to reduce by-catches should be maintained and strictly enforced; and
- 7.6. DFO Science investigate the biological link of Atlantic halibut in 3Pn to adjacent stocks in 4RST and 3NOPs4VWX5Ze. 3Pn is not currently included as part of the existing management units. Once this assessment is done, DFO management should then properly manage the removals from this area.



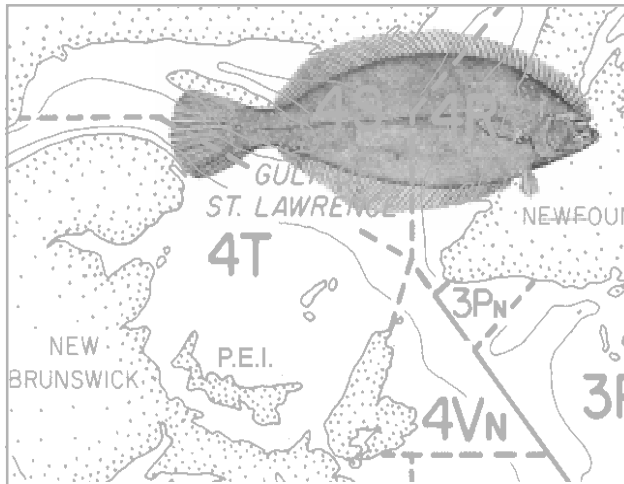
*1998 Catch: as of Dec 2/98

- Although catches of halibut less than 81 cm long, which is the minimum size limit for the fishery, have declined over the past few years, undersized specimens are still present in catches, notably in mobile gear landings and in gillnet catches. In gillnet catches, halibut under 81 cm in length account for 50% of the specimens sampled.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:	stock at low level <i>Compared to average</i>
Overall biomass:	stable at low level
Spawning biomass:	unknown
Recruitment:	some recruitment as per catch of immature fish
Growth and condition:	not available
Age structure:	no reliable indicator; wide size range present
Recent exploitation level:	TAC at 300t since 1991. by-catches of juveniles remain a concern and high mortality of released fish is of concern

8. WINTER FLOUNDER 4T



HISTORY OF FRCC

RECOMMENDATIONS:

Prior to 1996, when a precautionary quota of 1,000t was introduced, no TAC was established for this stock. In its 1993 through 1995 reports, the Council recommended that landings of this species be closely monitored, that the catches of small fish which had been prevalent for this species be rigorously addressed, and that directed fisheries for winter flounder be allowed only if and where by-catches of Atlantic cod could be kept at the lowest possible level.

The Council's recommendation in 1997 was that overall catches in that year not be allowed to exceed the longer term average of reported landings. Earlier recommendations regarding the need to report landings accurately, minimize juvenile mortality, and control by-catches of other species were reiterated for 1997. Council also requested that the question of stock components be addressed as part of the scientific program for this species.

In 1998, the Council recommended that overall catches not be allowed to exceed 1,000t, through the maintenance of a precautionary TAC, and that strong measures be maintained to guard against over-fishing of localized concentrations. The FRCC further recommended DFO Science and industry address the practicality of establishing sub-area quotas within the 4T stock for 1999.

1999 CONSULTATIONS:

Little discussion on the stock status occurred during the consultation. In Port Hawkesbury it was felt that nobody knows what the stock status is. Questions were raised about the size structure as the scientific survey shows a constant decline of the mean size over the past decade while it is more or less constant in the commercial fishery. It was also said that commercial catch rates are not a good indicator of abundance due to the various mesh sizes being used. The decline in biomass observed in some areas may be due to migration patterns, as the increasing abundance of American plaice may force the winter flounder to stay inshore. It is felt that the stock is not in as bad shape as described by the SSR. Several people raised the issue of the delineation of stocks units. In the Magdalen Islands, it was suggested that the population is composed of several "micro-stocks" that should be "micro-managed". A fixed gear fisher suggested that 130mm mesh size is too small and should be banned.

ANALYSIS:

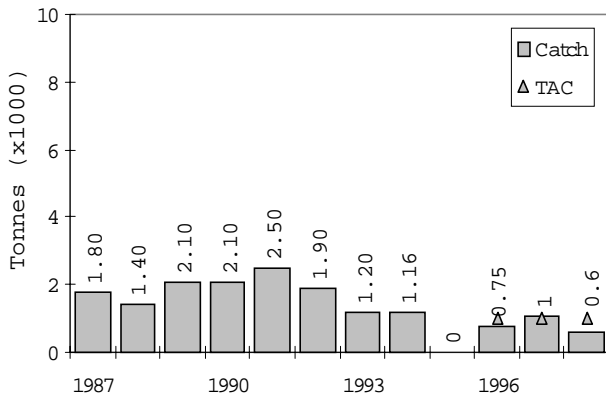
The 1999 DFO Stock Status Report indicates that:

- Winter flounder in 4T probably comprise several stock units. The information base for assessing this resource remains limited.

RECOMMENDATION #8:

The FRCC recommends that:

- 8.1 the TAC be capped at 1,000t;
- 8.2 discussions begin this year between science, management and the industry to implement local management measures that should be in place no later than the year 2000; and
- 8.3 appropriate mesh size be part of the management measures for each area.



*1998 Catch: as of Dec 2, 98

- Commercial catch rates calculated from trawlers in unit area 4Tg since 1991 peaked in 1994, declined to 1997, and remained at the same level in 1998. Catch rates from the single vessel catching winter flounder in the sentinel program in 4Tg indicate increased catch rates in 1998.
- DFO groundfish surveys suggest that winter flounder abundance is below average throughout 4T relative to estimates since 1971. The size composition has shifted to smaller fish, mean weight has declined and analyses indicate relatively high fishing mortality.
- Through consultations and telephone surveys of fishers, stakeholders appear to view the status of this resource favorably, particularly in 4Tg. Industry views the DFO groundfish survey with skepticism, as it does not provide adequate coverage of inshore winter flounder habitat and fails to indicate recruitment.

The FRCC notes that winter flounder is a sedentary species, year round resident, and the stock is certainly made up of a number of localized components. An indication of this comes from the survey that shows different trends between areas: around the Magdalen Islands, the survey index shows a decline since the beginning of the 80s with some marginal increase since the early 90s; east of Prince Edward Island, the index is more or less constant, with some fluctuations, over the past 15 years; around the Miramichi, it shows high fluctuations with a general increasing trend; in the Chaleur Bay, the index is highly variable with no particular trend.

The data provided shows several warning signals. The decline of the mean size observed in the scientific survey cannot be totally ignored; the relative fishing

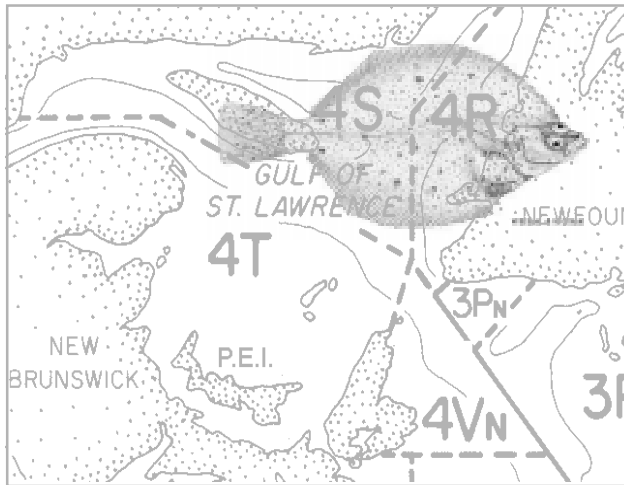
mortality is increasing since 1995 and the catch rates in the mobile fleet shows a decreasing trend since 1994. Several uncertainties exist. The survey only covers a small part of the overall distribution of the species and is recognized not to assess the recruitment effectively. The efficiency of the Alfred Needler survey to properly assess flat fishes is widely questioned.

The selectivity of gears in use remains a concern.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	overall abundance below average; varies between regions <i>Compared to average</i>
Overall biomass:	below average; catch rates stable since 1997, increased in some regions
Spawning stock biomass:	no information
Recruitment:	no information
Growth and condition:	varies by regions
Age structure:	mean size decreased in the survey; stable in the commercial catches
Distribution:	population likely to be composed of several sub-components
Recent exploitation level:	relative fishing mortality increased significantly since 1995

9. YELLOWTAIL FLOUNDER 4T



- Catch rates of commercial vessels show little change from 1994 to 1998.
- The mean weight/tow for all of 4T in the DFO research vessel survey remained relatively stable from 1985 to 1996, then decreased to the two lowest points since 1984.
- Research vessel survey data show relatively small modal (most common) lengths and small proportions of large fish throughout 4T in both 1997 and 1998.
- Relative fishing mortalities at length for 1997 are much higher than for 1995-1996 and 1998.

The FRCC notes that yellowtail flounder was traditionally fished for bait in the Magdalen Islands. A commercial fishery started in 1997, leading to landings reaching 800t. This amount resulted in a measurable decline in the biomass close to the Magdalen Islands, as indicated by the 1997 research survey. The market was not as interesting in the subsequent years. The pressure for the species was then relaxed which resulted in a significant decline in the relative fishing mortality.

The FRCC is concerned by the constant decline in the mean size of fish. It also notes that the validity of the current management unit is unclear as more than one stock may exist.

HISTORY OF FRCC

RECOMMENDATIONS:

The Council first commented on this stock in 1998. At that time the FRCC recommended that a catch level not exceeding 300t be set for the Magdalen Islands directed fishery. It was also recommended that a small fish protocol be formally established for this fishery, and that measures be established for the collection of biological data to give a better assessment of this stock.

1999 CONSULTATIONS:

No particular comments were made during the consultations

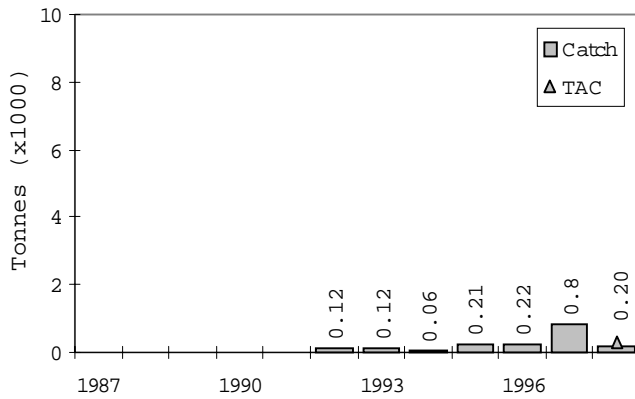
ANALYSIS:

The 1999 Stock Status Report indicates that:

RECOMMENDATION #9:

The FRCC recommends that:

- 9.1 a TAC of 300t be set in 1999 for the Magdalen Islands area;
- 9.2 in other areas, discussions between management and industry be implemented to define what is the appropriate by-catch level, over and above the recommended TAC, in order to allow the normal prosecution of other fisheries; and
- 9.3 discussions start this year between science, management and the industry to analyse the validity of the current management unit and to implement local management measures that should be in place no later than in the year 2000.



*1998 Catch: as of Dec.2,98

COUNCIL'S VIEWS ON STOCK STATUS:

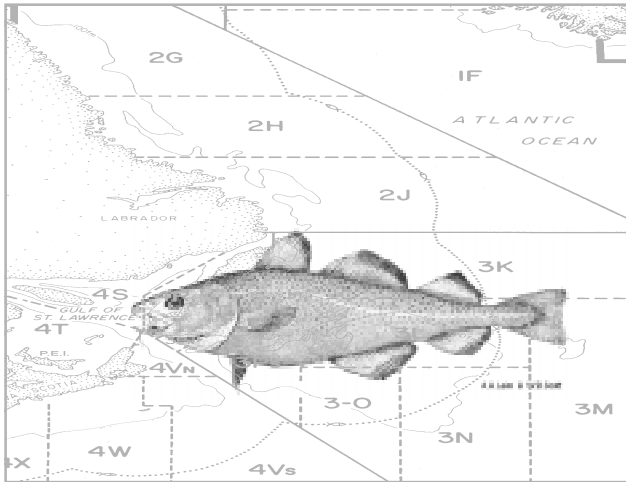
- | | |
|------------------------------------|--|
| Overall indicator: | population declined close to the Magdalen Islands after the high landings of 1997

<i>Compare to average</i> |
| Overall biomass: | declined since 1997 around the Magdalen Islands; stable at average level for the whole 4T |
| Spawning biomass: | likely to be stable at average level |
| Recruitment: | abundance of small fish increased in the 1998 survey |
| Growth and condition: | no information |
| Age structure: | constriction of the size distribution |
| Distribution: | fish localised around Magdalen Islands and around Prince Edward Island; the existence of several sub-components is debated |
| Recent exploitation levels: | low in 1998, same as in 1995 and 1996 |



CHAPTER 5: COD STOCKS IN NEWFOUNDLAND AND LABRADOR

10. COD 2GH



ANALYSIS:

The 1998 DFO Groundfish Overview indicates that:

- The catch has been negligible since 1990.
- The survey conducted in 1997 detected very few fish.
- The status remains unknown but abundance is assumed low.

There is limited information on this stock and no new information since the 1998 DFO Groundfish Overview. There are some by-catches reported by observers in the shrimp fishery, although the use of the Nordmore grid is intended to reduce this.

HISTORY OF FRCC

RECOMMENDATIONS:

In November 1993, the Council recommended that the 1994 TAC for 2GH cod be set at 1,000t as a precautionary measure. The consultations held in 1994 confirmed that there had been very few cod in 2GH in recent years and led the FRCC to recommend, in November 1994, that any fishery for cod in 2GH be carried out within the framework of a scientifically coordinated test fishery. The Council recommended that a nominal amount of 200t be provided for this purpose. In 1996, 1997 and 1998 the FRCC recommended no directed fishing take place on this stock and cooperative industry science surveys should be encouraged.

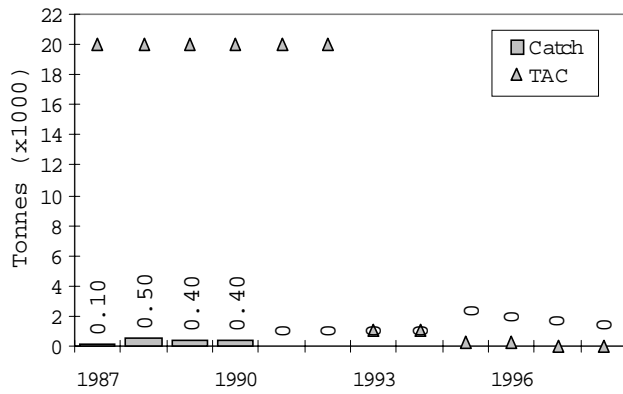
1999 CONSULTATIONS:

There were no comments received from fishermen specifically about 2GH cod.

RECOMMENDATION #10:

The FRCC recommends that:

- 10.1 there be no directed fishery on this stock.



COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator : very low, status unknown

Compared to average

Spawning biomass: unknown

Total biomass: unknown

Recruitment: unknown

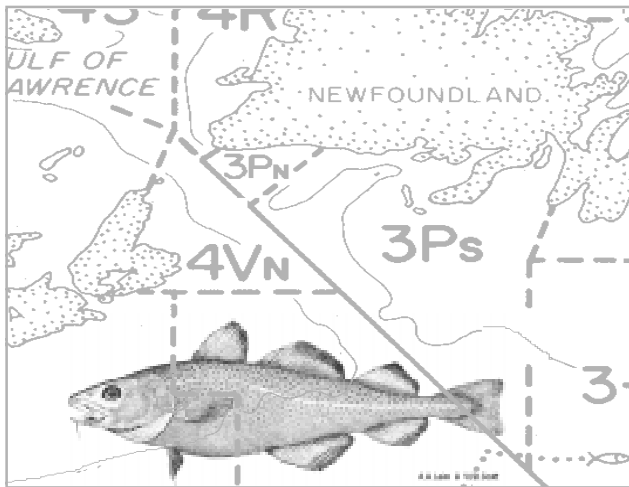
Growth/Condition: unknown

Age structure: unknown

Distribution: unknown

Recent exploitation: none - no fishery

11. COD 3Ps



HISTORY OF FRCC

RECOMMENDATIONS:

In August 1993, the low estimates of biomass for this stock led the Council to recommend that fishing be discontinued, at least until April 30, 1994. The fishery was closed by DFO in September 1993. While the Council indicated in its November 1993 report that recommendations for this stock would be forthcoming following the analysis of the results of the spring survey, such a review was made unnecessary when the

fishery was closed by the Minister of Fisheries and Oceans for the whole year.

In November 1994, the Council determined that the results of the 1994 survey confirmed earlier survey results and indicated that the stock abundance was at the lowest level observed since 1978. Consequently, the Council recommended that there be no directed fishing for 3Ps cod in 1995 and that by-catches be kept to the lowest possible level. The Council also recommended that efforts be made to expand surveys into inshore areas, that no recreational/food fishery be permitted and that a broad-based Sentinel Fishery program be implemented.

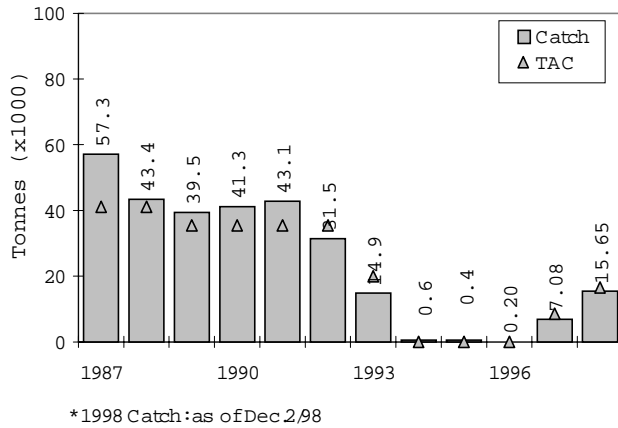
The Council's recommendations for 1996 were for a continued moratorium on commercial fishing and a significantly expanded Sentinel Fishery with an upset limit of 3,000t to evaluate the high catch rates found by Sentinel fishermen. In 1997 the FRCC recommended a limited commercial fishery with a TAC of 10,000t.

In March 1998, the Council recommended that the TAC for this stock be set at 20,000t, but that measures be taken to disperse the total catch over the fishing year to minimize impacts on stock sub-components. As in 1997, the 1998 recommendations included strict measures for the Conservation Harvesting Plans (CHP).

RECOMMENDATION #11:

The FRCC recommends that:

- 11.1 The 1999 TAC be set at 30,000t;
- 11.2 Measures be taken to reasonably disperse the total catch over the period of the fishing year outside the major spawning season to minimize impacts on stock sub-components;
- 11.3 Fishing on spawning concentrations be minimized in April, May and June;
- 11.4 Conservation Harvesting Plans include:
 - a) mandatory dockside monitoring and strict enforcement;
 - b) effort be better controlled including limiting the amount of gear used by fishing enterprises so as to better match the available resource and quota;
 - c) measures be implemented immediately to restrict the ability of fleet, through increases in mesh size, to target the 1989 and 1990 (i.e., age 10+) year classes as they move through the existing configuration of the fishery;
- 11.5 Acoustic survey techniques be integrated into the RV survey with the objectives of producing an absolute abundance estimate and reducing the high variability in the current survey; and
- 11.6 the winter fishery in the Burgeo Bank area should be closed from November 15 to April 15 to protect the 4RS3Pn stock components.



1999 CONSULTATIONS:

Fishers noted that the commercial catch rates were high and many felt that the cod stock had fully recovered in 3Ps. Several fishers noted that catch rates are higher now than at any time in their history and that catch rates are high in all areas. Fishers expressed concern with the presence of seals reported in Fortune Bay, Placentia Bay, and Hermitage Bay. There were varying views from fishers whether the Sentinel fisheries index should be used in the assessment. There was mention of small fish in the catch being high-graded. DFO biomass estimates were viewed as being conservative. Fishers also indicated that the present monitoring of the fishery was much improved and that fishery information was much more accurate than in the past. The consensus among inshore fishers was that a TAC of 40,000t should be applied for 1999. Views were expressed to protect the large cod as these fish are the most productive spawners.

ANALYSIS:

The 1999 DFO Stock Status Report indicates that:

- Average fishing mortality (ages 7-14) increased to 0.13 during 1998 from 0.05 in 1997.
- Fish aged 4-6, and 8-9 dominated the catches and there were few fish older than age 13. Age compositions were broadly similar to those seen in the 1997 industry survey.
- Estimation of stock size is complicated by a seasonal movement of cod into 3Ps from adjacent management units, notably the northern Gulf of St. Lawrence (3Pn4RS) during winter.

- Current (1998) estimate of age at 50% maturity is close to the lowest in the time series at 5 yrs.
- Condition of cod in the 1998 survey appeared to be normal. Fishers reported that cod caught during the commercial fishery were in good condition, particularly during fall.
- The risk of the spawner biomass falling below 100,000t was estimated to be 9% with a catch of 20,000t in 1999.
- The probability of exceeding an average fishing mortality of 0.25 over ages 7-14 in 1999 at this catch level is estimated to be 5%.

The FRCC makes the following observations in relation to this stock:

The FRCC believes that this stock continues to improve.

Tagging indicates that 3Ps cod from Placentia Bay migrate to the coastal areas of 3L. The Council holds the view that the extent to which this occurs may have implications for future management of this stock. The Council is asking DFO to increase its research on stock mixing issues and intends to initiate a process to address this particular situation as soon as sufficient information becomes available. The RV survey continues to exhibit an unacceptable level of inter-annual variability. The acoustic survey of Placentia Bay and a portion of 3Ps provides the closest match to the SPA

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	improving <i>Compared to average</i>
Spawning biomass:	among the highest recorded
Total biomass:	at a high level
Recruitment:	good
Growth and Condition:	stable growth, lower than in the 1970s; good condition
Age structure:	1989, 1990, 1992 year classes strong
Distribution:	more widespread
Recent exploitation:	low

for the past few years of any available index. It is noted that natural mortality is at normal levels in contrast to other cod stocks.

The FRCC observes that as this stock complex approaches historical harvest levels it is important that we develop a clear understanding of parameters associated with “conserving” the stock, compared with those that may be employed in the context of “rebuilding” the stock. Accordingly, the Council intends to initiate a process over the next year, for the purpose of developing a framework to guide future decisions. Industry and fishermen generally believe that a TAC greater than 30,000t is justified and sustainable. In support of this, fishery catch rates have been strong relative to historical levels and alternative models have suggested somewhat higher biomass levels. Nevertheless, in light of the several uncertainties about the status of this stock, and in recognition of all factors and information, a somewhat more cautious approach is advised. There is general agreement that this stock has rebuilt substantially and is at or above historic levels and potential. In particular, the SSB is at high levels. Hence the goal for this stock is to sustain high productivity, allow for modest growth in distribution and age structure, while encouraging redevelopment of a commercial fishery.

To accomplish this goal, a TAC of 30,000t is recommended, together with several conservation measures to protect the stock and allow for an increase in age structure and distribution. The SSR includes population statistics derived from a model reliant on an index from a highly variable survey. This model indicates that the SSB is unlikely to decline with a TAC as high as 40,000t. However, there are uncertainties in this approach. In addition to these analyses being dependent on highly variable surveys, there is evidence of stock mixing and movements to adjacent zones, and current low age at maturity may increase and lead to lower the SSB. There is added uncertainty because Sentinel fishery catch rates have shown a decline in the past year. A primary consideration for the future of this stock is the current lack of fish of ages greater than 10 yrs. The current rebuilding of this stock has been dependent on the survival and spawning success of the abundant ‘89 and ‘90 year classes. The FRCC believes that allowing numbers of these fish to advance to an older age is key to sustaining high productivity.

SENTINEL FISHERY:

Gillnet catch ratios were low in 1998 relative to previous years. They show strong seasonality and are consistently highest during the fall in the eastern side of Placentia Bay.

Line trawl catch rates have declined since 1995 and exhibit strong seasonality. Sentinel catch rates were generally good during all four years of the survey and were substantially higher than commercial catch rates in concurrent years.



CHAPTER 6: SCIENCE PRIORITIES LETTER

March 24, 1999

The Honourable David Anderson, P.C., M.P.
Minister of Fisheries and Oceans
200 Kent Street
Ottawa, Ontario
K1A 0E6

Dear Minister:

One component of the mandate of the Fisheries Resource Conservation Council (FRCC) is to advise you on research and assessment priorities. Recommendations are presented on a regular basis. (Science Priorities letters of January 1994, December 1996, and March 1998). Scientific issues, that should be addressed as a priority and that are still relevant, are also raised in the FRCC's Report "A Groundfish Conservation Framework for Atlantic Canada" (FRCC.97.R3. July 1997). We were pleased to see your acceptance of elements of this report in your press release of December 31, 1998 and urge the complete implementation of those recommendations as soon as possible.

1. Erosion of Science Funding

The Council wishes to draw your attention to the continued erosion of funds allocated to DFO Science for fisheries research. These cuts cause two main problems – reductions in both survey work and in the continuation of longer-term initiatives.

The FRCC relies on Science to provide it with basic information on stock status in order to provide you with credible advice. Surveying is one of the most important functions of fisheries science. Surveys not only provide abundance indices for several groundfish stocks, but they also provide valuable information regarding the ecosystem as a whole. Scientists should seek to use surveys in an integrated manner, also considering alternative types of surveys where appropriate (acoustic, juvenile, eggs and larvae) in order to provide a wealth of information about the species' dynamics and about the marine environment. In this past year, a number of long-term surveys were canceled without consultation. With one exception, these cancellations appear to have been made on an *ad hoc* basis in response to budget restrictions. Without the information from these surveys, stakeholders are free to question the credibility of our recommendations as we are forced to make these recommendations with less independent information.

In our letter of March 1998, Council recommended several courses of action on longer-term issues. While work has begun on some of these initiatives, other issues have been deferred because of budgetary constraints. We recognize that these issues represent a long-term commitment and that final results cannot be expected in the short term. It is important, however, that these initiatives be pursued. Therefore, we are raising these issues again in 1999.

There is a wide spread perception by Council members and many stakeholders that the DFO/Coast Guard merger has resulted in a significant erosion of at-sea data gathering. We continue to hear reports of vessels tied up at the wharf because of a lack of funds to carry out previously funded research surveys. This, coupled with reductions in the Science budget over the past few years, is of concern to the Council. Without an adequate capability of gathering much needed scientific data at-sea, the basis for stock assessments will increasingly be questioned by fishers. As well, the Council's job will be made that much more difficult as we attempt to formulate reasonable recommendations to you, particularly on TACs. After so many years of moratoria in some stocks, and vastly reduced fishing in others, stakeholders are expecting that DFO Science should understand more about these stocks and about the overall ecosystem.

I think it is fair to say that Canadians are expecting that the basic survey work will continue and that courses of action on those longer-term issues outlined in our March 1998 letter will continue. Many might find it



unacceptable to discover that DFO no longer has the capability to continue much of the research that was carried out in the past. **The FRCC, therefore, strongly advocates the restoration of the fisheries science program budget.**

2. Science Industry Initiatives

The science sector must continue to work to bridge the gaps which exist between science and industry. While several initiatives are already in place (e.g. sentinel surveys, offshore surveys on the Grand Banks and in 3Ps, redfish surveys, ITQ surveys in southern Nova Scotia), the FRCC previously noted that they are difficult to implement and that they are not consistently coordinated among the regions. Cooperation between the science sector and the industry should be systematically considered within the co-management approach (Integrated Fisheries Management Plans and Joint Project Agreements).

Sentinel fisheries are now beginning to provide a significant time series. As an example, data from both inshore fixed gear and mobile gear sentinel fisheries in 3Pn4RS and 4TVn are now formally incorporated in the analytical assessment of those cod stocks.

Sentinel fisheries, as well as other science-industry initiatives are important steps for reconciling scientists and the industry's perception of the status of the resource.

The Council supports the continuation and expansion of programs where the fishermen play an integral part in obtaining much needed scientific information and samples. However, fishermen must not just be considered merely as gatherers of data and providers of free platforms, but must be integrated into the scientific process as much as possible.

In its previous letter, the FRCC recommended that an Atlantic Coordinator should be appointed in order to promote science-industry initiatives both inside and outside the Department and to harmonize initiatives such as sentinel fisheries across the Atlantic and other cooperative ventures. **The Council considers this a high priority.**

3. The Recruitment Dilemma

In our March 1998 letter, the Council recommended that existing information about the recruitment issue should be consolidated in a formal report in a language understandable to a wide audience. That report was not provided.

The Council recognizes that collaborative work has already been done within DFO and with outside partners. Most of the published works are written in scientific formats and published in journals that are not easily accessible to a wide audience. We do not, however, have a consolidated description of the state of knowledge with respect to recruitment. It is important that all interested parties understand what is happening and what are the knowledge gaps.

While the industry has endured painful fishing closures in some stocks, signs of recovery are limited. For other stocks, for which fisheries are not under moratorium, warning signals are apparent. We must understand why some populations, such as the Southern Gulf of Saint Lawrence cod, are not able to replenish themselves even though the spawning stock biomass is significant.

The FRCC recommends again, as a priority, that a formal report on the recruitment dilemma should be provided before December 1999. We reiterate our recommendation that a DFO science committee be tasked to coordinate the preparation of this report.

4. Groundfish Consumption by Seals

This remains a major issue and DFO Science must expedite efforts to quantify the effect of seals' predation on groundfish. Valuable information, especially related to fish mortality by seals, is now being estimated for some stocks. The Council recommends that this procedure of treating seals population as a "fishing fleet" be adopted for all groundfish assessments where seal predation is a significant factor in resource status.

The Council will be making more specific recommendations on this issue in its next report, expected to be released in early May.

5. Identification and Verification of Stock Management Units

Mixing of stock units is a critical issue. For example, in the 2J3KL area, the issue of the overflow of the inshore cod stock biomass to recolonize the offshore area of the Grand Banks should be addressed as a very high priority.

The FRCC acknowledges that current scientific tools (*e.g.* otolith fingerprints, DNA probes, satellite telemetry) are now being used to identify stock boundaries. *Stock unit identification* is being addressed through joint projects between DFO and Universities, dealing with genetic diversity of populations. This research should be pursued and expanded. These studies should also be complemented by other sources of data such as tagging studies.

A large cod tagging program is already implemented in the Northern Gulf of Saint Lawrence. That type of program should be expanded to include other cod stocks. **The FRCC strongly recommends, once again, that a major tagging program, using the most appropriate mix of technologies, be implemented on cod stocks to help define mixing among stock management units. This program should be a collaborative effort involving industry participation.**

The FRCC recommends that because of the important implications of this work to industry and other interested parties, results be communicated in an integrated document.

6. The Scientific Process

The FRCC is very concerned about the presentation of scientific advice it receives from DFO fisheries science. In the recent period, there appears to be a breakdown in the scientific peer review process in that the formation of a consensus position is increasingly difficult to achieve both in the zonal and regional processes. The result of this breakdown in the process is that two or more options for total allowable catches are provided. This puts industry, the Council, and you, Mr. Minister, in a position where credible decision making is compromised and difficult to defend.

The FRCC urges you to encourage the achievement of consensus in the peer review process that is critical in the delivery of good science. The FRCC needs good science in order to meet its mandate.

In conclusion, the Council believes that the continuing financial constraints placed on fisheries science are manifesting themselves in an environment that is not conducive to the collegial collaboration required for good science. Sufficient funds must be made available to permit the process to work effectively.

On behalf of the Council, I would like to take this opportunity to thank the Department for the excellent support we have received over the last year and fully support the work of DFO scientists. Continuing to work together will assist us in making rational recommendations to you regarding the conservation and rebuilding of groundfish stocks.

Yours sincerely,



Fred Woodman
Chairman



APPENDIX 1: FRCC MANDATE AND MEMBERSHIP



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FRCC MEMBERSHIP:

MEMBERS:

Fred Woodman, Chairman
Jean-Claude Brêthes, Vice-Chair
Osborne Burke
Bruce Chapman
Ernest Després
Jean Guy d'Entremont
Gabe Gregory
Frank Hennessey
Dan Lane
Edward McAlduff
John Pope
George Rose
Louis Schofield
Trevor Taylor
Maureen Yeadon

PROVINCIAL DELEGATES:

Stephen Atkinson, Northwest Territories
Paul Cormier, New Brunswick
David Gillis, Prince Edward Island
Dario Lemelin, Québec
Dave Lewis, Newfoundland and Labrador
Clarrie MacKinnon, Nova Scotia

EX OFFICIO:

Guy Beaupré
William Doubleday
Barry Rashotte

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Chris J. Allen, A/Executive Director
Andrée-Anne Guibord
Tracey Sheehan
Debra Côté
Denis Rivard
Lisa Tenace
Marny Brown

NEWFOUNLAND GROUND FISH ASSESSMENT TEAM:

Fred Woodman, Chair
Jean Guy d'Entremont
Gabe Gregory
Frank Hennessey
Dave Lewis
Edward McAlduff



APPENDIX 2:

**LETTER TO STAKEHOLDERS
AND
QUESTIONS FOR DISCUSSION AT
CONSULTATIONS**

QUESTIONS FOR DISCUSSION AT CONSULTATIONS

2J3KL COD

What were your observations from the Index Fishery in 1998 (catch rates, size and condition of fish)? Were the fish where you expected to find them (traditional grounds) or elsewhere? Did you have any problem in catching your quota? Did you observe seals in your area? If so, were they more or less abundant than in 1997 and did they stay longer?

Based on sentinel and index fisheries and offshore surveys there is not good geographical distribution of cod in 2J3KL. What would be the long-term impact of a limited commercial or index fishery on the sustainability of the resource, particularly if catches were primarily from the southern portion of the stock range?

3Ps COD

In 1998, were cod more or less abundant than in 1997? How did your catch rates compare? What was the size and condition of fish? Was there good geographical distribution of your catch? Did you observe seals in your area? If so, were they more or less abundant than in 1997?

4TVN COD

Opportunities to observe the cod resource in 1998 were limited to sentinel, index and recreational fisheries and restrictive bycatches in other directed fisheries. On the basis of these indicators, what comments do you have regarding distribution of the resource, size run in the catches, indications of incoming recruitment, physical condition of the fish and the presence of prey/bait species for cod?

4RS,3PN COD

From the limited commercial fishery in this area, what have you observed, particularly in regards to distribution of the resource, size run in the catches, indications of incoming recruitment, physical condition of the fish and presence of prey/bait species for cod?

4T WHITE HAKE

Opportunities to observe the hake resource in 1998 were limited to sentinel, index and recreational fisheries and restrictive bycatches in other directed fisheries. On the basis of these indicators, what comments do you have regarding distribution of the resource – any observations on catches of hake in areas other than St. Georges Bay, size run in the catches, indications of incoming recruitment, physical condition of the fish, presence of prey/bait species for hake and any observations on catches of juveniles?

4T AMERICAN PLAICE

In recent seasons it has been reported that catch rates remain at or near traditional levels in some grounds (principally in the eastern portion of 4T) and are sharply reduced from traditional levels at other locations (principally in the western portion of 4T). Survey results show the same pattern. What are your observations regarding the distribution of the resource in 1998? To what extent do bycatch restrictions on cod interfere with your ability to target plaice? What was the physical condition of the fish observed in the 1998 fishery?

4T WINTER FLOUNDER

Recent catch rates and survey results both indicate that the abundance and status of this resource varies between different parts of 4T. What were your observations regarding distribution and abundance in 1998? Was there any



further re-direction of effort toward winter flounder in 1998? Many fishermen believe there to be distinct stocks of flounder in 4T. What suggestions do you have for what areas may be distinct? Any suggestions for additional research work?

4RST WITCH FLOUNDER

Fishermen reported large catches in the autumn of 1998. There were quota over-runs due to high catch rates. What were fishermen observing and where? ? Also what observations do you have regarding size of the fish, etc?

4RST ATLANTIC HALIBUT

What observations do you have regarding the state of this stock? What size, stock distribution, etc. have you observed?

4RST GREENLAND HALIBUT

In your experience what is the status of this stock in comparison to the fishery in the past ten years? How do catch rates per net compare in 1998 to past years when the fishery was conducted with 5.5-inch mesh as opposed to the current 6-inch mesh size? Should the mesh size be increased beyond 6 inches?

RECREATIONAL FISHERY

The recreational fishery has been very controversial. In your opinion should this type of fishery be permitted to continue in areas where there is no directed commercial fishery?

SCIENCE

The FRCC is mandated to provide the Minister of Fisheries and Oceans with recommendations on DFO science priorities. Are there specific issues you feel that need to be addressed, as research priorities, for the above stocks or any other groundfish stocks in the Gulf of St. Lawrence or Newfoundland? Are there priorities that you believe industry and Science can work on in partnership? How can the sentinel fishery be improved to provide additional information for Science?



APPENDIX 3: BRIEFS RECEIVED FOR CONSULTATIONS

APPENDIX 3: BRIEFS RECEIVED FOR CONSULTATIONS

April 6, 1999 - Gaspé, PQ

- FRCC.99.GR.PQ.8 Jacques Gosselin, Tous les pêcheurs de Cap Chat,P.Q..
- FRCC.99.GR.PQ.9 Daniel Vallée, Président, Regroupement des pêcheurs professionnels du Nord de la Gaspésie PQ.
- FRCC.99.GR. PQ.10 MORUE, mobilisation régionale pour l'urgence de l'emploi PQ.
- FRCC.99.GR. PQ.11 Pierre Chevrier, Président du R.P.P.U.M., P.Q.

Port-aux-choix, NF

- FRCC.99.GR.NF.13 Mr. Winston Mercer, Chairman - Fishermen's committee, Upper Island Cove, Nfld
- FRCC.99.GR.NF.14 Fisherman's Committee of Coachman's Cove,Nfld.

April 7,1999 - Iles de la Madeleine,

- FRCC.99.GR.PQ.12 A.P.P.I.M.

April 8,1999 - Moncton, NB

- FRCC.99.GR.NB.15 Brian Stevens, Seafood Processors Assoc. of P.E.I.
- FRCC.99.GR. NB.16 Association des Pêcheurs de Poisson de Fond Acadiens (Zone 4T-1999)
- FRCC.99.GR.NB.17 John H. Banks, Souris, P.E.I.

April 9,1999 - Port Hawkesbury, NS

- FRCC.99.GR.NS.19 Gerard MacEachern, Director – Gulf Groundfish Federation
- FRCC.99.GR.NS.20 Mobile Fishers – Cheticamp – Bay St. Lawrence
- FRCC.99.GR.NS.21 Ronald E. Heighton, President – Northumberland Fishermen's Association
- FRCC.99.GR.NS.22 Groundfish Enterprise Allocation Council
- FRCC.99.GR.NS.38 Clifford Aucoin – Northern Cape Breton Fishing Vessel Association

Clarenville, NF

- FRCC.99.GR.NF.23 Earle McCurdy – Fish, Food and Allied Workers Union
- FRCC.99.GR.NF.24 Earle McCurdy – Fish, Food and Allied Workers Union
- FRCC.99.GR.NF.25 Brian Phillips – Inshore Fishermen's Improvement Committee
- FRCC.99.GR.NF.26 Thomas E. Best, Co.Chair – Eastern Avalon/Southern Shore <35' Vessels Fish Harvesters Association
- FRCC.99.GR.NF.27 John Hewitt, Fishing Industry Representative – Irish Loop Regional Economic Development Board
- FRCC.99.GR.NF.28 The Southern Shore Fish Harvesters Action Committee
- FRCC.99.GR.NF.29 Brian Walsh – Coalition of Under 35 ft. Concerned Fishermen's Committee for 3L Area

FRCC.99.GR.NF.30 Hayward Pike – Charleston, NF.
FRCC.99.GR.NF.31 Bill Broderick, Fisherman – St. Brendans, Bonavista Bay, NF
FRCC.99.GR.NF.32 Dr. George Winters – Focus Technologies Inc.
FRCC.99.GR.NF.33 Dr. George Winters – Focus Technologies Inc.
FRCC.99.GR.NF.34 Fisherpeople of Hermitage, Seal Cove, Gaultois & McCallum
FRCC.99.GR.NF.35 Fishery Product International
FRCC.99.GR.NF.36 Earle McCurdy – Fish, Food and Allied Workers Union
FRCC.99.GR.NF.37 Earle McCurdy – Fish, Food and Allied Workers Union
FRCC.99.GR.NF.39 Earl Johnson, Fisherman 3Ps, Placienta Bay, NF

Briefs Received by Mail

FRCC.99.GR.NF.1 John Osmond, Mgr. Eric King’s Fisheries Ltd. and Joanne Butland,
St. Lawrence Seafoods Ltd. Nfld.
FRCC.99.GR.NF.2 Fred Winsor (PhD.) St. John’s, Nfld.
FRCC.99.GR.NB.3 Denis Robichaud, APPFA Inc. NB.
FRCC.99.GR.NS.4 Clifford Aucoin, President, NCBFVA.
FRCC.99.GR.NF.5 Dawson Martin, Fisherman, Bonavista, Nfld.
FRCC. 99.GR.NF.6 Brian Grandy, Member of Action Committee 3Ps larger boats.
FRCC.99.GR. NF. 7 Austin Zucker, Fisherman, English Harbour, Nfld.
FRCC. 99.GR.NF.18 Carl Parsons, Clarke’s Beach, Nfld.
FRCC. 99.GR.PQ40 Position de l’Alliance lors de la Consultation du CCRH pour la
pêche à la morue dans le Golfe St-Laurent. P.Q.
FRCC.99.GR.NS.41 Inshore Fishermen’s Concern 4T American Plaice N.S.
FRCC.99.GR.PQ.42 L’Alliance des pêcheurs professionnels du Québec P.Q.
FRCC.99.GR.Nf.43 Industry Results from Area 3L Offshore Surveys, Northern.(2J3KL) N.F.
FRCC.99.GR.NF.44 Indusrty Results from Areas 2J and 3K Offshore Surveys NF.

200 MILE FISHING ZONE AND NAFO FISHING BOUNDARIES

