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Fishery Management Plan

Greenland Halibut

NAFO Subarea 0
2003-2005

**This version has been updated as of January 2005.
Modifications have been made to sections dealing with SARA and the Cumberland Sound Fishery.**

Canada

Produced by:

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Winnipeg, MB
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DFO 2005/795

Internet Home Page:
http://www.dfo-mpo.gc.ca

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Cat No. Fs23-475/2005E

ISBN 0-662-40491-2

Cette publication est aussi disponible en français

Also available in: Inuktitut

Fishery Management Plan: Greenland Halibut, NAFO Subarea 0, 2003-2005

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1. Executive Summary

Preamble

This document outlines management approaches for the 2003 through 2005 Greenland Halibut (a.k.a. turbot) fishery in the Northwest Atlantic Fisheries Organization (NAFO) Subarea 0. (Currently this includes Canadian waters adjacent to Nunavut with the exception of a portion of Cumberland Sound.) These waters are managed by Canada on the basis of the conservation principle and NAFO Scientific Council catch recommendations. The management plan is further guided by provisions of the Nunavut Land Claims Agreement and the Nunavik Inuit Marine Region Agreement-in-Principle for the participation of Inuit in use and management of the offshore fisheries. A Subarea 0 turbot management plan review meeting held in January 2003 involved resource users and stakeholders in establishing biological and socio-economic objectives for the fishery and providing recommendations for management.

Biological Synopsis

Greenland Halibut in Subarea 0 are part of a large stock complex that extends east to Greenland and south to the waters of the continental slope of Labrador and the outer Grand Bank east of Newfoundland. Relatively little information exists about Greenland Halibut in Subarea 0. Little is known about the timing and location of spawning, or the migration of Greenland Halibut over the course of their life cycle. In general, many small Greenland Halibut, defined as fish smaller than 45 cm, are found in Baffin Bay (68.1% in 2001 surveys) as compared to Davis Strait (46.8 % in 2001 surveys). Due to difficulties determining the age and degree of maturity of these small fish in Baffin Bay, it is not clear whether they are young fish that will later migrate south to Davis Strait, or older fish that are growing slowly due to the environmental constraints presented by cold northern waters. It is also not clear how important the small fish in Baffin Bay are to the overall health of the stock complex. Different groups of fish species in Baffin Bay versus Davis Strait indicate that the ecosystems in the two areas are different. Some information exists regarding food webs in Subarea 0, but it is not sufficient to determine the potential ecosystem impacts of the Greenland Halibut fishery.

Overview of the Fishery

The Canadian-Greenland Halibut fishery began in Division 0B in 1981. The Division 0B fishery currently consists of a Canadian quota of 5,500t split between Nunavut, Newfoundland, and Maritimes fishing interests. There has also been an exploratory fishery in Division 0A since 1996, with a Canadian quota of 4,000t in 2002 that is provided to the Nunavut Wildlife Management Board (NWMB). The NWMB currently allocates this quota to the Baffin Fisheries Coalition (BFC). An inshore long-line under-ice fishery for Greenland Halibut also exists in Cumberland Sound. In December 2004 the NWMB recommended that a new management zone be established for Greenland Halibut within Cumberland Sound and in April 2005 the Fisheries Minister announced his agreement with this proposal. Small inshore experimental fisheries may occur in other areas of Nunavut including areas within Cumberland Sound outside the new management zone but these will remain as part of the respective quotas tabled in Subarea 0. (see Annex II, April 26, 2005 News Release). For 2001, the estimated value of landings (based on prices paid by processors to purchase fish) was $3,580,816 from Division 0A and $7,853,765 from Division 0B.

Stock status

Recent NAFO surveys show stable stock biomass in Subareas 0+1, but recent NAFO assessments suggest that the stock is in decline in Subareas 2 and Divisions 3KLMNO. Available data suggest that the strong 1995 year-class has been predominant in the Subarea 0 fishery over the last few years. The 2000 year-class is almost as strong and should be available to the fishery beginning in 2004. As the dominant 1995 year-class is fished and moves out of the fishable stock for natural reasons (mortality or migration), the fishery will likely rely more heavily on the strong 2000 year-class. This presents a concern because catches of small fish are expected to increase in the next few years, and if another strong year class is not produced, it may be necessary to substantially reduce fishing mortality. Research is currently underway Atlantic-wide to improve information on Greenland halibut immature life stages (eggs, larvae, and juveniles), age determination, stock delineation and movements, and reproductive processes (precise field methods to estimate maturity, and research on location and timing of spawning).

Fishery objectives

The following objectives for management of the fishery were established with stakeholders at the January 2003 Subarea 0 turbot management plan review meeting:

Biological

1. Improve scientific knowledge of the Greenland Halibut stock.
2. Based upon scientific knowledge and the precautionary approach, maintain a healthy Greenland Halibut stock.
3. Minimize harvest of small fish, as defined by the small fish protocol.
4. Operate consistently with Species at Risk legislation.
5. Protect critical habitat and ecosystems (e.g. narwhal overwintering areas and deep-water corals).

Socio-economic

1. Full Canadianization of the Greenland Halibut fishery.
2. Priority for majority Nunavutization of this resource over an acceptable period of time.
3. Develop a healthy and sustainable fishery.
4. Recognize participants who have developed this fishery to its current status through historic fishing investment and contribution to science.

Conservation considerations and management measures

Management measures in this plan have been developed to address potential conservation concerns for the Greenland Halibut stock as well as for other species and the broader ocean ecosystem.

In order to address concerns regarding small fish in Division 0A, the overall total allowable catch in Division 0A will remain conservative, and the use of long-line vessels will be encouraged. Other management measures will also be considered in order to minimize the catch of small fish in Subarea 0.

In order to protect non-target species, by-catch is limited to a per trip maximum of 10% of non-directed species for all vessels, and there is mandatory release of Atlantic Halibut less than 81cm and other prohibited species. Spotted Wolffish and Northern Wolffish are listed as “threatened” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). There are special management practices in effect such as the live release of wolffish. The *Species At Risk Act* (SARA) also prescribes the need for special permits to continue other activities that may impact on wolfish. Cumberland Sound

beluga and Eastern Arctic bowhead are listed as “endangered” and may also require special management measures. Narwhal overwintering grounds and deep sea corals that are found in the Southeast corner of NAFO Division 0A are protected by licence conditions that limit all vessels to a maximum total of four days of fishing in these areas each year.

In order to gather information necessary to protect spawning fish where possible, observers are required on all vessels operating January to April inclusive to look for evidence of spawning from December through May. Onboard observers are required to report cetacean sightings and deep-sea coral in the catch throughout the year.

Other management measures already in place regarding gear restrictions, gear conflicts, dockside monitors, observer coverage, hails, logbooks, and enforcement remain unchanged. Conservation Harvesting Plans (CHPs) are required for all fleets involved in the Greenland Halibut fishery.

Inshore, small vessel fisheries are excluded from several management measures developed for offshore fisheries but will be subject to management measures included as specific license conditions.

Following a request for advice from Canada regarding Cumberland Sound, NAFO Scientific Council recommended that a separate management area be established based on evidence of an isolated inshore stock in the inner portion of the Sound. This area is subject to appropriate management measures developed in cooperation with established co-management partners.

Financial responsibilities

Financial responsibilities for Greenland Halibut management remain unchanged, with industry paying commercial licence fees and bearing the full sea day costs of onboard observers, costs of contracts for dockside monitors, and costs of travel to, and accommodation at, public fora regarding the fishery. DFO is responsible for the normal operating costs associated with landings monitoring, management, and surveillance as well as consultation with resource users and stakeholders in public fora, and administration of observer and monitor programs. For the last several years, DFO has partnered with other groups to fund scientific research on Greenland Halibut in Subarea 0.

Performance review

There will be an opportunity for stakeholder and resource user feedback on the management plan at the end of each fishing season. A full review of the management plan will take place at the end of the third year, unless an earlier review is deemed necessary. This review will evaluate the management plan in terms of the success of management measures (success of implementation and effectiveness in meeting stated objectives), catch to quota ratios, and other measures that may require changes. If necessary, changes to management measures will occur based on this review.

2. Preamble

The Department of Fisheries and Oceans Canada (DFO) is charged with the responsibility of managing the fish and marine mammal resources of the Northwest Territories, Nunavut, and the Yukon North Slope. Within that area, the Department's objective is to conserve Arctic fish and marine mammal resources, enhance the net value of the economic and social benefits received by Canadians from those resources, and provide for the equitable distribution of those benefits.

The Greenland Halibut fishery addressed in this management plan occurs in Northwest Atlantic Fisheries Organization (NAFO) Subarea 0, which is divided into Division 0A in the north (Baffin Bay) and Division 0B in the south (Davis Strait) (Figure 1)(excluding the inner portion of Cumberland Sound). At the request of Canada and Greenland, the NAFO Scientific Council provides scientific recommendations for this fishery, including recommended Total Allowable Catch (TAC) for Divisions 0A and 1A/B, and for Divisions 0B and 1C-F. Subarea 1 (Divisions 1A-1F) falls in Greenlandic waters. Canada and Greenland discuss the recommended TACs at their annual bilateral meetings. Canada retains management authority for stocks in Subarea 0 while Greenland establishes harvest levels and management measures in Subarea 1.

With the signing of the Nunavut Land Claims Agreement (NLCA), the Nunavut Wildlife Management Board (NWMB) was established as the main instrument of wildlife management in the Nunavut Settlement Area (S 5.2.33, NLCA). The NSA includes extensive marine areas adjacent to Nunavut (S 3.2.1 NLCA). The NWMB has, but is not limited to, the following powers, duties and functions within the NSA, which includes Cumberland Sound:

5.2.33 Recognizing that Government retains ultimate responsibility for wildlife management, the NWMB shall be the main instrument of wildlife management in the Nunavut Settlement Area and the main regulator of access to wildlife and have the primary responsibility in relation thereto in the manner described in the Agreement.

5.2.34 In addition to its primary functions outlined in Section 5.2.33, the NWMB shall in its discretion perform the following functions related to management and protection of wildlife and wildlife habitat;

(d)(i) approve plans for management, classification, protection, restocking or propagation, cultivation or husbandry of particular wildlife, including endangered species.

5.6.16 Subject to the terms of this article, the NWMB shall have sole authority to establish, modify or remove, from time to time and as circumstances require, levels of total allowable harvest or harvesting in the Nunavut Settlement Area.

5.6.48 Subject to the terms of this Article, the NWMB shall have sole authority to establish, modify or remove, from time to time and as circumstances require, non-quota limitations on harvesting in the Nunavut Settlement Area.

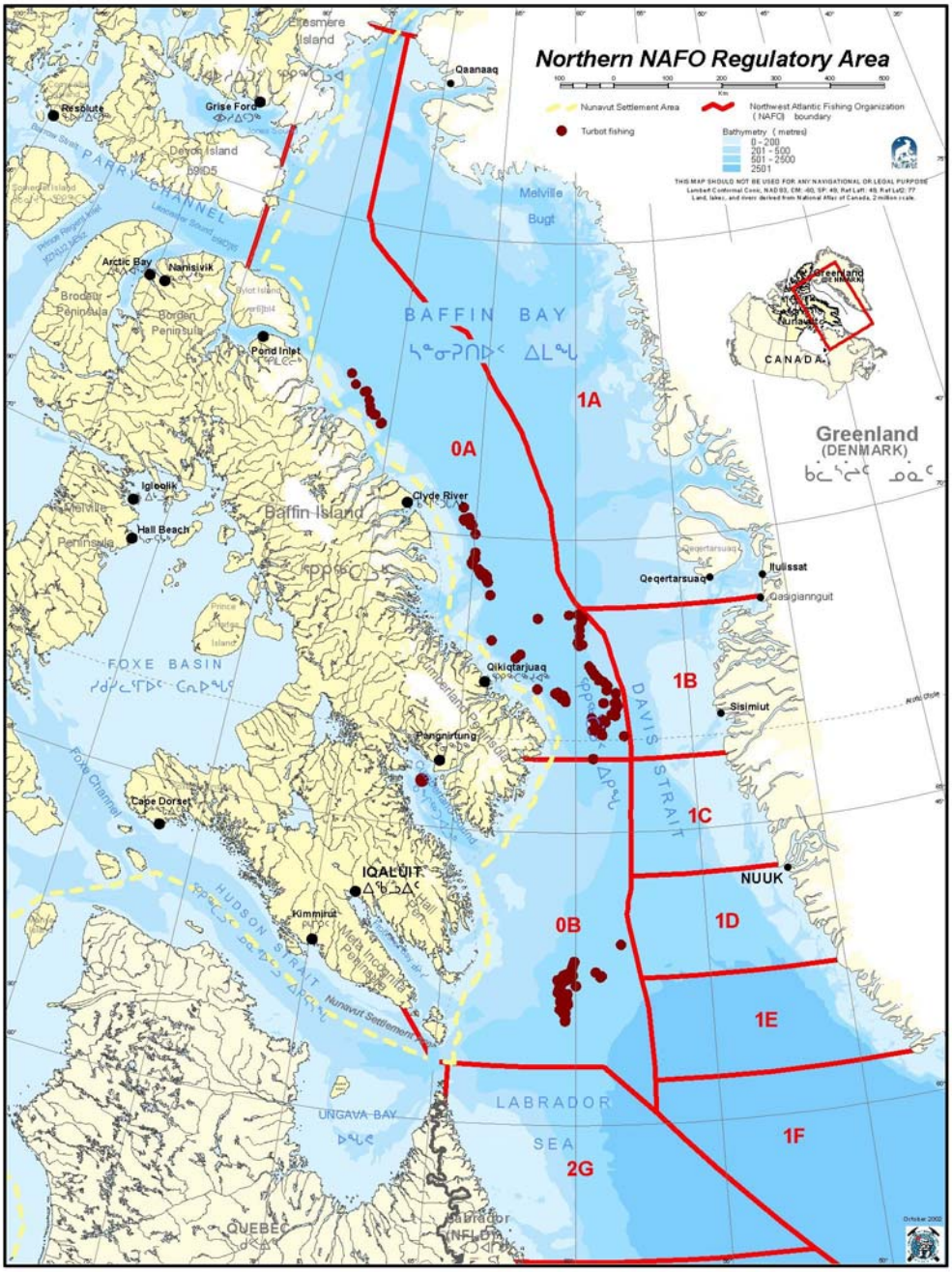


Figure 1. Northern NAFO Regulatory Area showing Subarea O and Divisions OA and OB. Dots show Greenland Halibut fishing vessel positions for 2002 (from Canada-Nunavut Geoscience Office, Iqaluit).

There are also provisions in the NLCA covering the wildlife management and harvesting beyond the marine areas of the NSA, such as the offshore fisheries in Baffin Bay and Davis Strait. They include the following:

15.3.4 Government shall seek the advice of the NWMB with respect to any wildlife management decisions in Zones I and II which would affect the substance and value of Inuit harvesting rights and opportunities within the marine areas of the NSA. The NWMB shall provide relevant information to Government that would assist in wildlife management beyond the marine areas of the NSA.

15.3.7 Government recognizes the importance of the principles of adjacency and economic dependence of communities in the Nunavut Settlement Area on marine resources, and shall give special consideration to these factors when allocating commercial fishing licences within Zones I and II. Adjacency means adjacent to or within a reasonable geographic distance of the zone in question. The principles will be applied in such a way as to promote a fair distribution of licences between the residents of the Nunavut Settlement Area and the other residents of Canada and in a manner consistent with Canada's interjurisdictional obligations.

15.4.1 The Nunavut Impact Review Board (NIRB), the Nunavut Water Board (NWB), the Nunavut Planning Commission (NPC), and the NWMB may jointly, as a Nunavut Marine Council, or individually advise and make recommendations to other government agencies regarding the marine areas, and Government shall consider such advice and recommendations in making decisions which affect marine areas.

Coordinating the management of Greenland Halibut inside and outside of the NSA through consultation with the NWMB is essential for completing a fully integrated management plan for Greenland Halibut in NAFO Subarea 0.

Nunavik (Northern Quebec) Inuit have signed an Agreement-in-Principle for the Nunavik Marine Region containing provisions regarding their interest in the NAFO Division 0B Greenland Halibut fishery. Fisheries and Oceans Canada will respect the intent of these provisions in its dealings with Makivik Corporation, which represents the Nunavik Inuit. Once a final agreement has taken effect, DFO will work with the appropriate management authorities created by the agreement in order to manage Greenland Halibut stocks in areas covered by the agreement.

Inuit Qaujimajatuqangit (IQ) has traditionally been a part of Inuit systems of fisheries management. There is a need for an effective role of IQ in all aspects of fisheries management, including research. While Greenland Halibut were not traditionally fished by Inuit, Inuit fishers as well as other users have knowledge of the resource that should be incorporated into management.

Decisions regarding the use of renewable resources may have long-lasting effects. Some may be irreversible. Therefore it is important that the harvesting level be consistent with accepted conservation principles. Conservation is defined as sustainable use that protects ecological processes and genetic diversity for present and future generations. The Atlantic Fisheries Policy Review proposes that conservation should be the first principle and highest priority governing resource management for the Atlantic coast fisheries. Policy elements of this conservation principle include the precautionary approach, ecosystem-based management, a conservation ethic and responsible harvesting operations, and an appropriate regulatory framework. This

management plan maintains conservation as the guiding principle for management of the Greenland Halibut fishery in NAFO Subarea 0.

This management plan is in effect until December 31, 2005. A review will be conducted at the end of the third year unless an earlier review is deemed necessary.

3. Biological Synopsis

The Greenland Halibut (*Reinhardtius hippoglossoides*, also known as turbot) belongs to the order Pleuronectiformes, a group of flat, bilaterally asymmetrical fish made up of seven families and 117 species. The members of this order begin their lives swimming with their dorsal fin upwards, but gradually one eye migrates across the top of the larva's skull, positioning itself close to the eye on the other side of its head. The skull bones, nerves and muscles are also modified, and the fish begins to swim on its flat, eyeless side. The Greenland Halibut is unusual for the order Pleuronectiformes because it is a fast swimmer, an effective hunter, and an unusually mobile flatfish. Greenland Halibut can move both horizontally and vertically. Smaller Greenland Halibut, which tend to swim in the middle of the water column rather than on the ocean floor, have been known to swim with their dorsal fin upwards, and adult Greenland Halibut have been observed at the surface of the ocean as well as at various depths. (Anonymous 1993).

Greenland Halibut live in the cold northern waters of the Pacific and Atlantic oceans. In the northwest Atlantic, they are particularly abundant in the deep coastal bays and fjords of West Greenland, off the continental shelf of Baffin Island, and in the Ungava Bay area of Hudson Strait (Anonymous 1993, Scott and Scott 1988).

The NAFO Division 0A and 0B Greenland Halibut addressed by this management plan are part of a much larger stock complex. This stock complex extends east into Greenland waters (NAFO Subarea 1) and south to the waters of the continental slope of Labrador and outer Grand Bank east of Newfoundland (NAFO Subarea 2 and Divisions 3KLMNO) (Anonymous 1997, in Junquera et al. 1999), and possibly to Icelandic and Norwegian waters (Vis et al. 1997). Greenland Halibut of the Northwest Atlantic are highly migratory: fish tagged and released in Davis Strait, Baffin Bay, and the fjords of southwestern and eastern Greenland have moved as far as 2500 km to Denmark Strait (between Greenland and Iceland; Boje 2002a). This movement ensures genetic mixing and prevents genetic separation into distinct stocks, with the possible exception of Greenland Halibut in the Gulf of St. Lawrence (Arthur and Albert 1993; Vis et al. 1997).

Greenland Halibut in the fjords of northwestern Greenland appear to be resident in these fjords, and once they have migrated from offshore nursery areas to the fjords, they do not intermingle with populations in the offshore or more southerly fjords (Boje 2002a). A separate management unit with a separate total allowable catch was therefore delineated in the inshore of NAFO Division 1A in 1995.

Evidence from a smaller tagging study conducted in Cumberland Sound suggests that a similar resident population may exist there (Treble 2003). In 2004 NAFO Scientific Council reviewed the information available and concluded that Greenland halibut in the Cumberland Sound traditional winter fishing grounds do not move beyond these

grounds. They recommended that a separate management unit for Greenland Halibut in the inner portion of Cumberland Sound be established.

Knowledge of Greenland Halibut spawning is limited. The proportion of females found in spawning condition in catches or in surveys is consistently small (Boje 2002b), probably because different populations or groups of fish undertake spawning at different times (Boje 2002b). Females produce relatively few eggs (6,100-188,400 eggs/female in a recent study [Gunderson 2002]); instead, they produce heavily-yolked eggs that result in large larvae with high survival rates (Boje 2002b). These larvae are thought to feed on the large plankton found in the deeper pelagic layers, remaining independent of the seasonal plankton blooms of the upper ocean layers. There is therefore no need either for a fixed spawning season to match planktonic blooms, or for very high fecundity to ensure that some larvae survive (Boje 2002b).

Very little is known about spawning timing and location for North Atlantic Greenland Halibut. The Baffin Bay-Davis Strait stock is thought to originate primarily in the deep-water (800-2000m) spawning grounds in Davis Strait near the submarine ridge between Baffin Island and Greenland (Boje 2002b, Bowering 1999), from about 67° N to south of Flemish Pass off Newfoundland (Boje 2002b). Recent Canadian surveys and Canadian fishing operations have caught maturing fish but have not encountered spawning fish, possibly because spawning is occurring in the very deep waters of the Labrador Sea beyond the range of survey equipment. It is also possible that Greenland Halibut are spawning at times of the year when they cannot be surveyed or fished because of sea ice. Spanish research suggests that Greenland Halibut spawning does not show a clear seasonality at all, and peak spawning does not coincide year after year (Boje 2002b).

Once spawning occurs, eggs and then larvae drift for up to four months before they metamorphose into the bottom-dwelling life stage (Boje 2002b). Eggs and larvae originating in the Davis Strait spawning grounds are thought to drift with the currents along the coast of West Greenland and towards Canada, until larvae settle on the slopes of the banks of Greenland and Canada (Templeman 1973, in Boje 2002b). These shallow waters (<400 m) in Baffin Bay and Davis Strait are considered nursery areas where fish are thought to spend the first few years of their lives. Larger fish are found at greater depths and it is believed that the fish migrate off the banks into deeper waters, eastward into the fjords of Northwest Greenland and south and westward into Baffin Bay and Davis Strait. Some fish that develop on the banks of West Greenland may cross Davis Strait to settle on the Canadian shelf, joining other fish that might be carried there by currents as larvae (Crawford 1992).

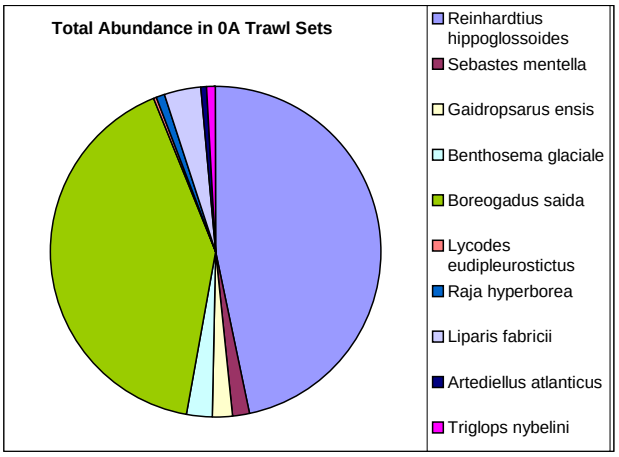
Greenland Halibut age and size at maturity vary widely over space and time (Morgan and Bowering 1997). A recent study found the age at which 50% of sampled fish were mature in NAFO Divisions 3KLM ranged from 9.5 to 15.0 years for females, and from 8.2 to 11.6 years for males (Morgan and Bowering 1997). This variation did not exhibit any trends, and is probably the result of irregularities in the maturation process and spawning of Greenland Halibut. The only estimate available for Subarea 0 is for 1993 in 0B, when length of females at 50% maturity was measured at 68.6 cm for fish caught in the commercial deepwater gillnet fishery. However, given the temporal variability of such estimates, this single estimate cannot be extended to represent average length at maturity for female Greenland Halibut in Subarea 0.

The majority of Greenland Halibut caught in 0A surveys are smaller than those found in 0B, which may be attributable to reduced growth due to environmental constraints. Conversely, Baffin Bay may be a rearing ground for juveniles, which migrate into south Davis Strait and the Labrador Sea once they grow bigger.

Greenland Halibut feed on a variety of species during their lives. Small fish (<20 cm) feed on small pelagic crustaceans, while intermediate-sized fish (about 20-60 cm) feed mainly on a variety of small fish (primarily Arctic cod [*Boreogadus saida*] in the north and capelin [*Mallotus villosus*] on the Labrador and Grand Bank shelf area) and on northern shrimp (Pandalidae) where these are abundant. Larger Greenland Halibut (>60 cm) feed mostly on other fish, preferring larger species such as Redfish (*Sebastes* spp.) and Grenadiers (Macrouridae). They have also been known to prey heavily on invertebrates such as deepwater squids (*Gonatus* spp.). Orr and Bowering (1997) found that individual size was the most important variable related to species composition in the diet, followed by depth and latitude.

Natural mortality (M) of Greenland Halibut used in stock assessment calculations for North Atlantic stocks has varied between 0.10 (Ernst and Borrmann 1987, in Crawford 1992) and 0.20 (Ray Bowering, pers. comm.). This equates to 10 to 20% of the population per year. The Greenland shark (*Somniosus microcephalus*) and narwhal (*Monodon monoceros*; Laidre et al. in submission) are considered to be the main predators of Greenland Halibut in Baffin Bay and Davis Strait. Hooded seals (*Cystophors cristata*; Kapel 2000), ringed seals (*Phoca hispida*; Siegstad et al. 1998), and beluga (*Delphinapterus leucas*) are also important predators of adult Greenland Halibut (Crawford 1992). Scientists working in Greenlandic waters have noticed that the periodic disappearance of Greenland Halibut often coincides with increased sightings of beluga, and that periodic invasions of whales into the fjords are often followed by a collapse of the Greenland Halibut fishery (Anonymous 1993). The larvae of Greenland Halibut are eaten by cod (*Gadus morhua*), Atlantic Salmon (*Salmo salar*), and other species, and young fish are eaten by cod and larger members of their own species (Anonymous 1993).

Greenland Halibut in Division 0A and Division 0B areas are a part of two different fish species complexes (Figure 2). This difference in species composition may be partially attributable to the differences in environmental conditions in the two Divisions. Bottom temperatures in 0A are normally at or near 0 degrees Celsius, which is three to four degrees cooler than bottom temperatures at similar depths in 0B (Treble 2002). The difference between these two areas may affect the growth and reproduction of Greenland Halibut.



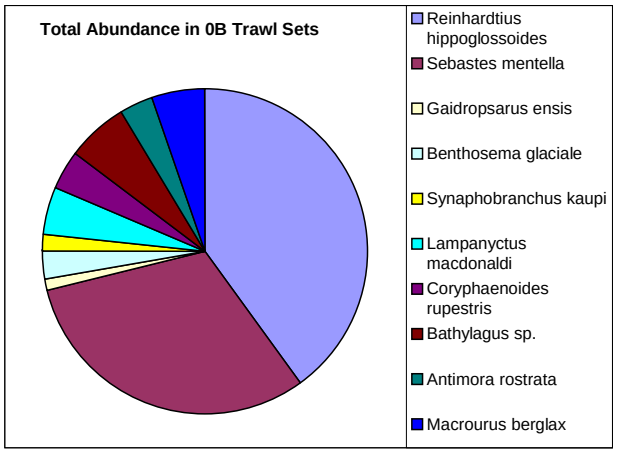


Figure 2: Ten most abundant species caught in otter trawl surveys conducted in NAFO Divisions 0A (1999) and 0B (2000).

Understanding species interactions can be helpful in assessing the effects on the entire ecosystem of increased mortality due to fishing of a single species or group of species. Figure 3 illustrates a food web for the deep-sea environment of Baffin Bay and Davis Strait combined. This food web includes humans because they are important consumers of Greenland Halibut, shrimp, and marine mammals. The food web shows that several fisheries could be affecting single fish species via different links in the food web (Chambers and Dick, in prep.).

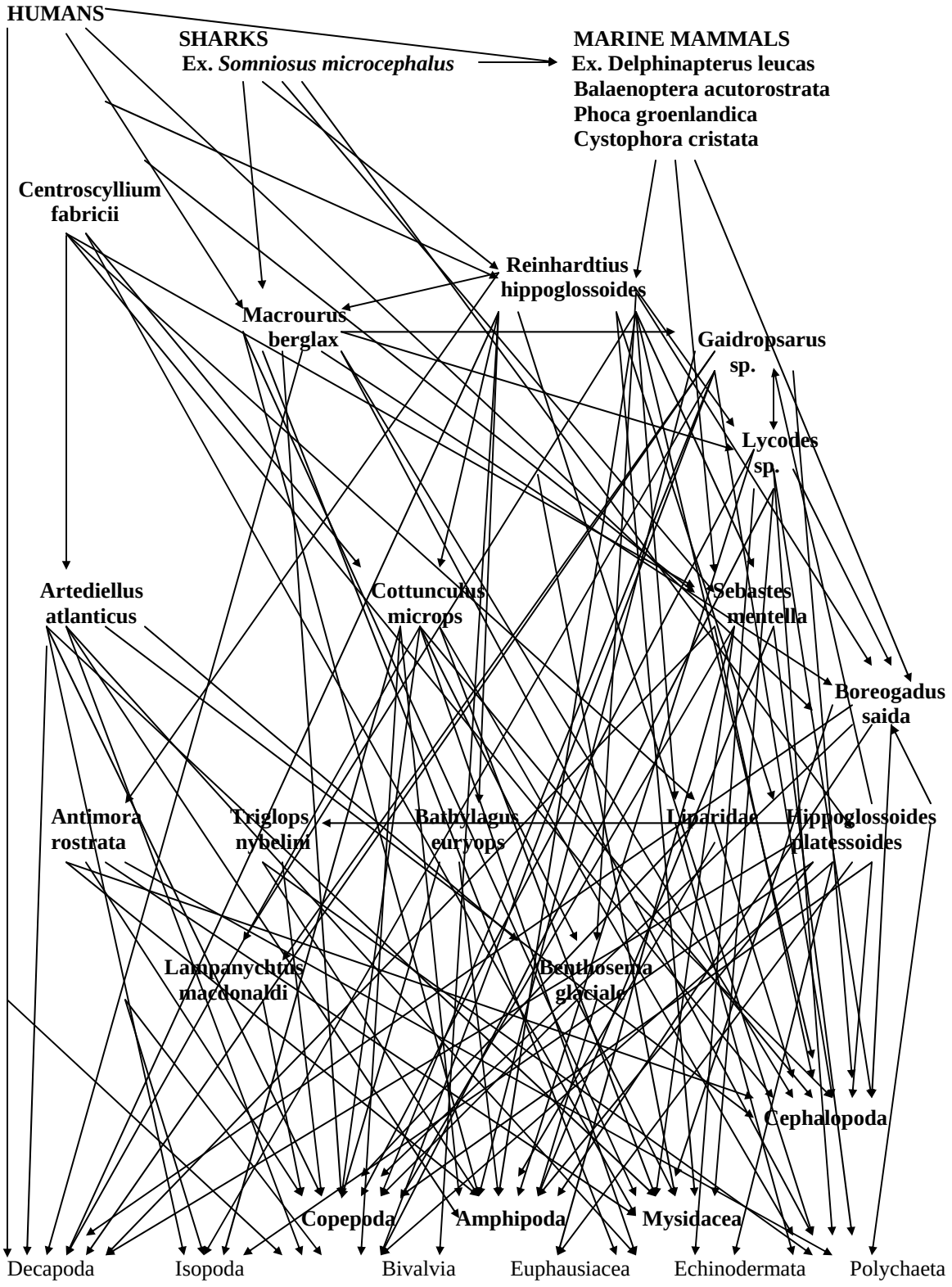


Figure 3: Preliminary food web for the deep-sea community of Baffin Bay and Davis Strait based on stomach content analysis (from Chambers and Dick, in prep.).

4. Overview of the Fishery

4.1 Location

The Canadian Greenland Halibut fishery addressed by this management plan occurs in NAFO Subarea 0. Subarea 0 is divided into two Divisions: 0A (Baffin Bay) and 0B (Davis Strait), as shown previously in Figure 1 excluding the inner portion of Cumberland Sound. Because Subarea 0 falls within Canadian waters, it is managed by Canada with the assistance of NAFO Scientific Council recommendations. The NAFO Scientific Council recommends Total Allowable Catches (TACs) for the entire Baffin Bay/Davis Strait-West Greenland management unit. Separate recommendations are made for 0A/1A,B (offshore) in the north, and 0B/1C-F in the south. (Until June 2003, these recommendations were made for 0A/1A [offshore] and 0B/1B-F.) Canada and Greenland discuss how the recommended TACs will be split between the two countries at annual bilateral meetings. Figure 1 also shows fishing vessel locations in Subarea 0 for the Greenland Halibut fishery in 2002.

4.2 Historical development of the Canadian Greenland Halibut fishery

The Canadian Greenland Halibut fishery began in Division 0B in 1981, at which time most of the Canadian quota was allocated to foreign countries. These foreign allocations were steadily reduced until they were eliminated in 1992. In 1988, the Inuit of what is now Nunavut received an inshore allocation of 100t. During the 1990s, with the collapse of most major groundfish resources in the Northwest Atlantic, Greenland Halibut became the most significant groundfish fishery in the region (Bowering 1999). Meanwhile, the Greenland Halibut stock began to decline in biomass and shift in age structure (Bowering et al. 1995, in Morgan and Bowering 1997). In 1994, based on the first detailed assessment of this Greenland Halibut stock (Atkinson et al. 1994, cited in Bowering 1999) and other information, the NAFO Scientific Council recommended that the TAC in the Baffin Bay/Davis Strait-West Greenland management unit be reduced significantly from 25,000t to 11,000t . Canada's quota for Subarea 0 dropped from 12,500t to 5,500t. It remains at 5,500t for Division 0B.

Beginning in 1986, an inshore longline through-ice fishery for Greenland Halibut was developed in Cumberland Sound. Catches in this fishery peaked in 1992 at 430 tons. Declining catches throughout the 1990's were due mainly to deteriorating ice conditions that limited safe access, but have been increasing again in recent years. The total Cumberland Sound catch was 106 tons in 2002 and approximately 245 tons in 2003. As of December 2004, a separate quota was established for this fishery and includes provision for a summer fishery in the inner portion of Cumberland Sound by recommendation of NAFO Scientific Council. The quota set for this area is 500 tons.

Small inshore experimental fisheries for Greenland Halibut are beginning in other areas of Nunavut.

Before 1996 there was no fishery in Division 0A. While there was no separate Greenland Halibut quota identified for Division 0A, from 1996 to 2000 an exploratory fishery in 0A allowed Nunavut interests a harvest of up to 300t. Harvests in the 0A exploratory Greenland Halibut fishery were not counted against the Canadian quota of 5,500t.

In June of 2000, the NAFO Scientific Council recommended that an additional TAC that would generate a low fishing mortality be implemented for the offshore areas of 0A and 1A. The recommended TAC for this area for 2001 and 2002 was 4,000t. In 2001, Canada established an exploratory fishery quota of 3,500t in 0A, increasing it to 4,000t in 2002.

For 2004, NAFO Scientific Council recommendations for TAC are 11,000t for 0B/1C-F and 8,000t for 0A/1A,B (offshore). For 2003, the recommendations for TAC were 11,000t for 0B/1B-F and 8,000t for 0A/1A (offshore). At bilateral meetings in January 2003, Greenland and Canada agreed to split the 0B/1B-F quota 50:50 but did not agree on a split for the 0A/1A,B(offshore) quota.

Table 1 summarizes the development of the fishery over time.

Table 1: Subarea 0 Greenland Halibut fishery development history.

1981 – 1991	- Majority of Canadian quota allocated to foreign countries. - Foreign allocations were steadily reduced from 9,500t in 1987 until they were eliminated in 1992.
1988	- 100t Nunavut inshore allocation introduced in 0B (within the Nunavut Settlement Area).
1990	- Northern Greenland Halibut Development Program began as a means for Canadians to access underutilized or unutilized fish stocks and a 5,360t developmental allocation created. The Department issued annual invitations for proposals to harvest the developmental allocations. The majority of the developmental allocation was harvested by chartered foreign vessels. - Nunavut allocation increased to 500t.
1992	- Developmental allocation increased to 10,460t. - Nunavut allocation increased to 1,000t.
1993	- Developmental quota reduced to 3,920t. - Introduction of 6,540t competitive quota for Canadian licence holders.
1994	- Significant reduction in TAC following NAFO Scientific Council advice. - Competitive allocation eliminated. - Nunavut allocation remained constant.
1996	- Developmental quota reduced to 2,500t in an effort to reduce the use of foreign charters in the fishery and encourage its Canadianization. - Introduction of exploratory allocation in 0A (32 fishing days, or about 300t maximum) to Nunavut which was not counted against the Canadian quota. - Addition of 500t allocation in offshore area of 0B to Nunavut (total 0B allocation then 1,500t). In addition, approval was given for uncaught inshore allocations to be transferred offshore for harvesting annually. - Competitive allocation re-introduced at 1,500t (split 900t fixed gear and 600t mobile gear).

1998	- 5 year Management Plan announced (1998-2002) following extensive consultations with stakeholders. - Plan included provisions for Nunavut to receive 50% of any increase in the subarea 0 Canadian quota. - The use of foreign vessels to harvest the Canadian quota was eliminated. - "Developmental" allocations renamed "company" allocations.
2000	- Access to competitive fishery restricted to those groundfish licence holders who had historically participated in the fishery.
2001	- New 0A exploratory fishery allocation of 3500t. This was provided exclusively to Nunavut interests.
2002	- Increase in 0A exploratory allocation to 4000t all of which was provided to Nunavut interests. - Final year of 1998 management plan.

4.3 Participants

The NWMB allocates the Nunavut quotas in both Divisions 0A and 0B to Nunavut interests.

In Division 0A, all of the Canadian quota is currently allocated to the NWMB. The NWMB provides this allocation to the BFC, which in turn may allow non-Nunavut fishing companies to harvest portions of the quota in exchange for royalty fees.

In Division 0B, the Canadian quota is split between competitive quotas (1,500t), company allocations (2,500t), and a Nunavut allocation (1,500t). In 2000, the competitive quotas for Canadian groundfish licence-holders were limited to historical participants. They are split between vessels from the Maritimes region and from Newfoundland. The competitive quota is split 900t for fixed gear licence holders and 600t for mobile gear licence holders. Company allocations, formerly called "Developmental quotas", are split between companies from the Maritimes region, Nunavik, and the Newfoundland region (including Labrador). Although some of the vessels participating in the competitive fishery also receive transfers of quota from the companies holding company allocations in 0B, none of the companies with company allocations in 0B receive licences to participate in the competitive fishery. All vessels in the 0B fishery are Canadian.

Table 2 documents the history of Subarea 0 quotas from 1981 through 2002.

Table 2: Subarea 0 Canadian Greenland Halibut quota history.

Subarea 0 Canadian Greenland Halibut Quota History								
	1981-1989	1990-1991	1992	1993	1994-1995	1996-2000	2001	2002
0A								
Nunavut						300 (exploratory)	3,500	4,000
Total 0A	0	0	0	0	0	300	3,500	4,000
0B								
Foreign Charters	12,400	6,640	1,040	1,040	4,500			
Developmental/ Company Allocations		5,360	10,460	3,920		2,500	2,500	2,500
Nunavut	100	500	1,000	1,000	1,000	1,500	1,500	1,500
Competitive (see note)				6,540	0	1,500	1,500	1,500
Total 0B	12,500	12,500	12,500	12,500	5,500	5,500	5,500	5,500
TOTAL	12,500	12,500	12,500	12,500	5,500	5,800	9,000	9,500

Note - Competitive allocation split between fixed gear (900t) and mobile gear (600t)

4.4 Time frame

Offshore Greenland Halibut fishing takes place mainly over the months of May through December. There are currently no restrictions on fishing seasons. In the next few years, newer technologies and approaches may allow Greenland Halibut fishing to occur year-round.

A through-ice fishery takes place during the winter months in Cumberland Sound. There are now plans underway to conduct small exploratory fisheries in other inshore areas within the NSA (Rankin Inlet, Clyde River and Pond Inlet).

4.5 Landings/Value/Markets

0B
The 0B fishery took a total of 3,858t of Greenland Halibut in 2002-2003. Of this, 106t were taken in the inshore longline ice fishery in Cumberland Sound.

0A
The 0A fishery is an exploratory fishery. In 2002-2003, 3,561t of Greenland Halibut were harvested in this fishery. 1,144t were taken by fixed gear, and 2,417t by mobile gear. Small fish make up a large portion of the catch in Division 0A, ranging from 27% to 50% from 1996 to 2001.

Quotas and catches from 1987-2003 for Subarea 0 are summarized in Table 3 and Figure 4.

Table 3: Subarea 0 Greenland Halibut quotas and catches (1987-2003).

Area and Fishery	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999-2000	2000-2001	2001-2002	2002-2003
0A																
Canadian quota	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3500	4000
Nunavut (exploratory)	0	0	0	0	0	0	0	0	0	295	203	42	0**	211	2610	3561
Total 0A	0	0	0	0	0	0	0	0	0	295	203	42	0**	211	2610	3561
0B																
Total Allowable Catch	12500	12500	12500	12500	12500	12500	12500	5500	5500	5500	5500	5500	5500	5500	5500	5500
Foreign /NAFO quota	9500	9400	6800	6600	5600	0	0	0	0	0	0	0	0	0	0	0
Canadian quota	3000	3100	5700	5900	6900	12500	12500	5500	5500	5500	5500	5500	5500	5500	5500	5500
Foreign catch	830	1288	1059	2527	3319	536	0	0	0	0	0	0	0	0	0	0
Developmental	0	0	0	6431	6058	8266	7289	4343	3919	2501	2538	0	0	0	0	0
Company Allocations	0	0	0	0	0	0	0	0	0	0	0	1628	1995	2557	2964	1643
Nunavut inshore	4	11	180	255	147	430	425	400	285	60	66	63	34	45	77	106
Nunavut offshore	0	2	0	0	0	1020	20	0	407	1417	1446	1720	1568	1341	1013	812
Competitive (see note)	0	0	0	0	0	0	799	0	736	1561	2078	1731	1991	1458	926	1297
Total 0B (Foreign + Canadian)	834	1301	1239	9213	9524	10252	8533	4743	5347	5539	6128	5142	5588	5401	4980	3858
Total Canadian Catch	4	13	180	6686	6205	9716	8533	4743	5347	5834	6331	5542	5588	5612	7590	7419

* In 1993, developmental and competitive offshore quotas were permitted to be caught in either Subarea 0 or Divisions 2GH.

** Although there was no exploratory catch for Nunavut in 1999 in 0A, there was a catch of about 310t in 0A, that was reported in 0B catch.

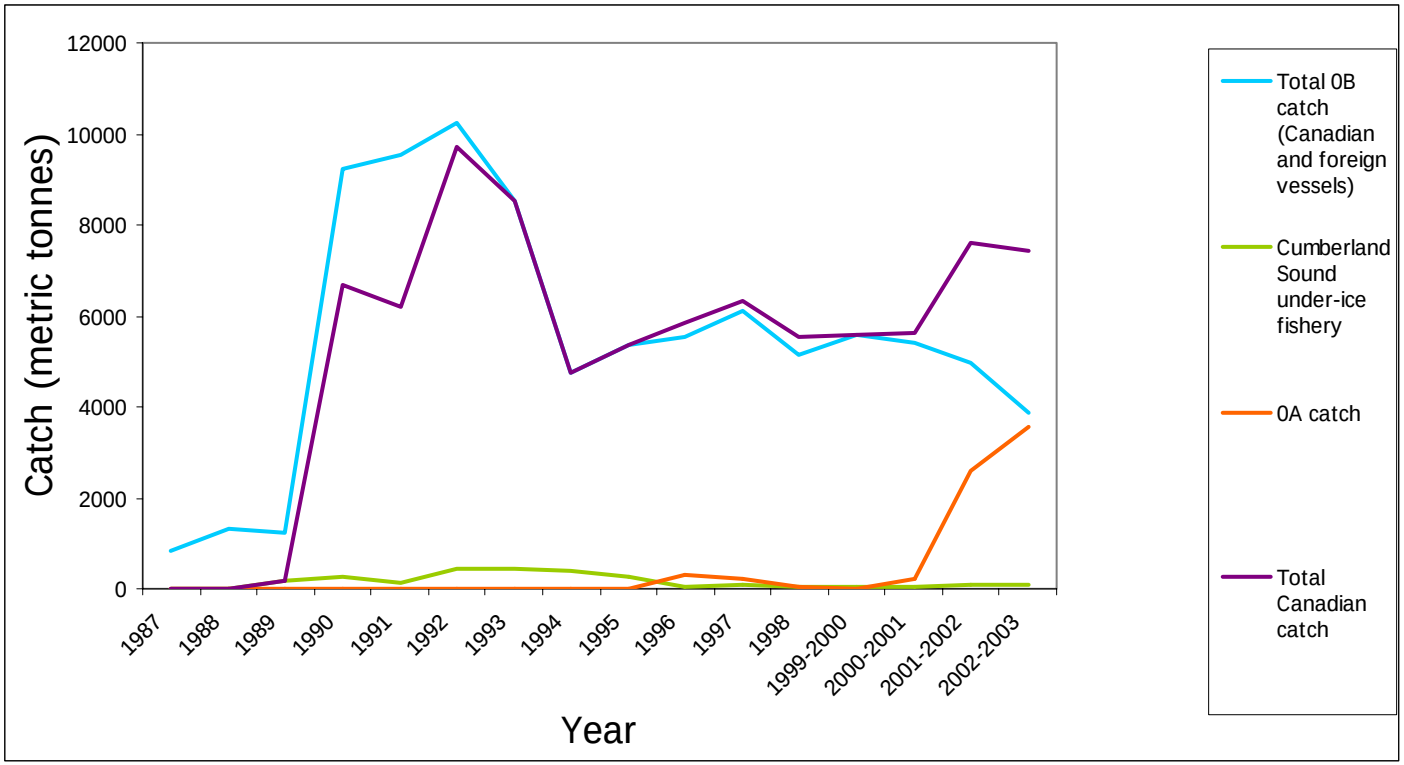


Figure 4: Subarea 0 Greenland Halibut catches (1987-2003).

The total value of the economic benefits from the Subarea 0 Greenland Halibut fishery has not been assessed.

For 2001, the estimated value of Greenland Halibut landings (based on prices paid by processors to purchase fish) was $3,580,816 from Division 0A and $7,853,765 from Division 0B.

One of the main sources of income from the fishery in Nunavut is royalty agreements between Nunavut quota allocation holders and non-Nunavut fishing companies harvesting Greenland Halibut. For 2001, harvest royalty revenues paid to Nunavut quota holders were estimated at $1,078,350 for 2,452t harvested in 0A, and $787,500 for 1,500t harvested in 0B (Whitford 2002).

The inshore fishery in Cumberland Sound was a source of about $170,000 in gross fishing revenue in 2001 (Whitford 2002) and over $500,000 over the winter of 2003. The offshore and inshore fisheries create economic benefits related to the fish processing plant in Pangnirtung, and provide employment to Nunavummiut. Whitford (2002) estimates that about 100 Nunavut residents are employed in the Greenland Halibut fishery every year, with about 20 people working onboard offshore trawlers, 24 working as inshore fishers or their helpers, and 56 working in fish processing.

The largest markets for Canadian-caught Greenland Halibut in 2002 were China, Japan, Taiwan, and the United States. Of the Greenland Halibut processed in Nunavut, an estimated 95% of the catch is sold to US markets, with the remaining 5% going to Canadian markets (Whitford 2002).

4.6 Management Plan Development Process

This management plan was drafted following a consultation meeting with fishery participants and other stakeholders held in Iqaluit, Nunavut, January 29 and 30, 2003. The goal of the meeting was to review the previous management plan, discuss management issues, and provide management recommendations to the Minister of Fisheries and Oceans. A list of agenda items discussed at the meeting and a list of meeting participants are included in Annex III. Recommendations from the meeting are discussed in section 10.2: Post seasonal analysis recommendations.

The draft management plan was reviewed by resource users and stakeholders. The draft was summarized and presented to the Nunavut Wildlife Management Board, including comments by stakeholders. Following resource users, industry, and NWMB input and NWMB review and approval, the final draft plan and a summary of recommendations is to be forwarded to the Minister of Fisheries and Oceans for approval.

4.7 Previous Management Styles

Prior to 2003, the Subarea 0 Greenland Halibut fishery was managed together with all Atlantic groundfish under the Integrated Fisheries Management plan for Atlantic Groundfish. The last Atlantic-wide plan was in effect from 1998 to 2002.

4.8 Links with other activities under the *Oceans Act* and other planning initiatives

Currently there are no links between this management plan and *Oceans Act* initiatives. It is possible that a Marine Protected Area (MPA) for narwhal will be developed in NAFO Division 0A.

Species at risk recovery planning is underway for Northern Wolffish, Spotted Wolffish, and Cumberland Sound Beluga. As the *Species at Risk Act* is in effect, the recovery plans developed for these species will take precedence over provisions of this management plan. In the event of future developments regarding species at risk, the provisions of the *Species at Risk Act* will take precedence over management measures outlined in this management plan.

5. Stock Status

Greenland Halibut throughout the Northwest Atlantic are thought to constitute a single stock complex. However, for the purpose of catch reporting and stock management, the Greenland Halibut stock is divided into five separate management units:
1. Baffin Bay/ Davis Strait-West Greenland (NAFO Subareas 0 and 1);
2. Labrador and Eastern Newfoundland (NAFO Subarea 2 and Divisions 3KLMNO);
3. Gulf of St. Lawrence (NAFO Divisions 4RST);
4. NAFO Division 1A inshore; and
5. NAFO Division 0B inner portion of Cumberland Sound.

All of these management units are managed by whichever country (or countries) has the stock within its waters. The second management unit is an exception: because it extends outside Canadian waters into international waters, the NAFO Fisheries Commission is the management authority.

Subarea 0, the subject of this management plan, is managed by Canada with the assistance of NAFO Scientific Council recommendations.

5.1 Stock status assessment

In the 1990s a decline was observed in the Greenland Halibut stock in Canadian waters. Research vessel surveys showed decreasing biomass estimates, and older fish made up a declining proportion of the population (Bowering et al. 1995, in Morgan and Bowering 1997). There was also a change in the distribution of Greenland Halibut, with fish moving increasingly into the Flemish Pass area between the Grand Banks and the Flemish Cap (Anonymous 1994, in Morgan and Bowering 1997). The change in the population was not matched with density dependent responses in reproductive characters such as mean fecundity at age (Boje 2002b). This could indicate that Greenland Halibut reproductive parameters are slow to respond to external changes such as fishing pressure (Boje 2002b).

The observed decline in the Greenland Halibut stock appeared to have ceased in 1998 through 2000, mostly due to good recruitment based on an exceptionally strong 1995 year-class. However, the stock now seems again to be in decline in Subarea 2 and Divisions 3KLMNO (Anonymous 2003).

Recent NAFO surveys show a slight increase in estimates of stock biomass for Subarea 0. The details of the most recent scientific surveys in Baffin Bay and Davis Strait are outlined below.

The reliability of estimates of abundance at age presented below are uncertain. Slower growth rates for Greenland Halibut from Baffin Bay may explain why they are extremely difficult to age using the whole otolith method. DFO science researchers (Central and Arctic Region) have initiated an age validation project to determine the accuracy of the current whole-otolith ageing method, and are examining different age estimation techniques such as sectioning and staining in order to improve ageing for this species.

5.2 Results of NAFO scientific surveys

Division 0B

A stratified random otter trawl survey covering depths from 400 to 1500 m was conducted in Division 0B from October 19 to 26, 2001 (Figure 5). Greenland Halibut were caught in all tows, with the highest densities averaging 2.5 t/km^2 between 1001 m and 1250 m depth. Two strata that accounted for 2,705 tons in the 2000 survey were missed in the 2001 survey. Nevertheless, biomass appears to have increased from previous surveys, with the biomass in the survey area estimated at 68,917 tons, with a standard error (SE) of 6, 523 t in 2001, as compared with 56,212 tons (SE 10,813 t) in 2000. Total estimated abundance was 74.6 million fish (SE 12.7 million) in 2000, and 85.9 million (SE 8.7 million) in 2001.

Lengths of fish caught ranged from 7 cm to 97 cm (Figure 6). In 2000, two length modes were evident, at 19 cm (small mode) and 44 cm, while in 2001, lengths ranged from 8 cm to 97 cm with a single length mode at 45 cm. The lack of a smaller length mode in the 2001 survey may reflect changing year-class abundance over time and/or the fact that fewer shallow-water (<400 m) tows were conducted in the 2001 survey. Forty-seven percent of fish caught in 2001 were smaller than 45 cm.

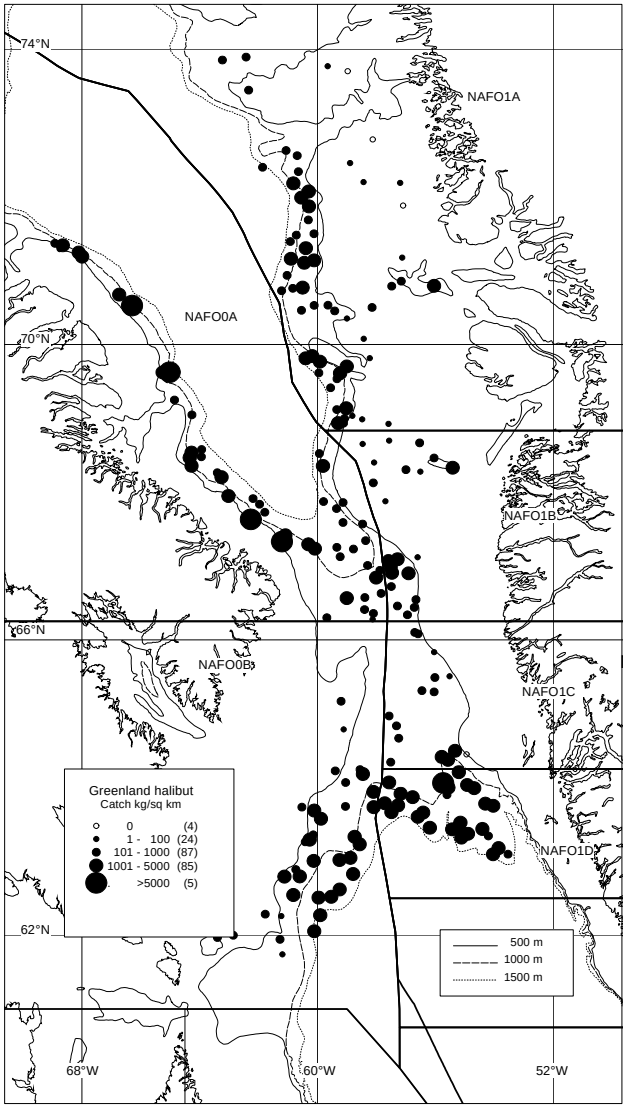


Figure 5: Greenland Halibut catch distribution (kg/sq km) for NAFO Subareas 0 and 1 surveys, 2001 (from Treble and Jørgensen 2002).

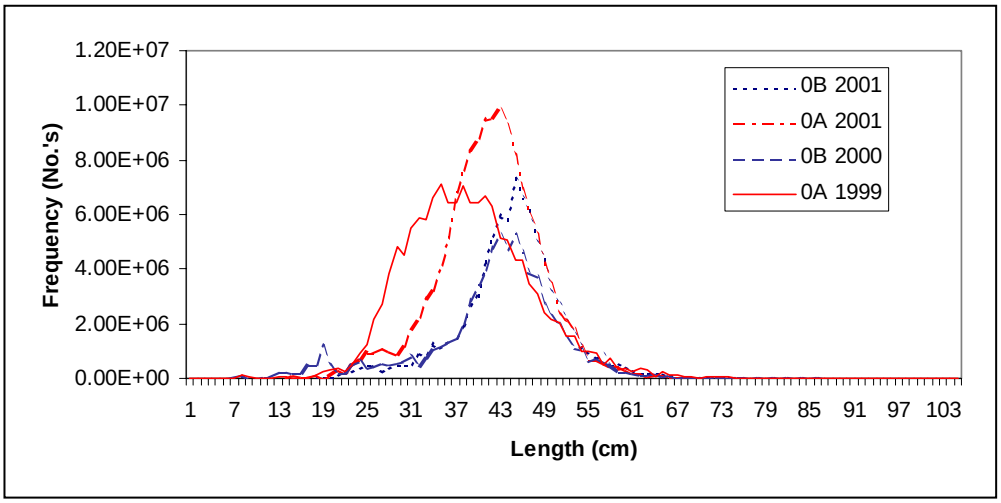


Figure 6: Estimated abundance at length for Greenland Halibut from surveys conducted in NAFO Divisions 0A and 0B, 1999 to 2001.

The age distribution of surveyed fish ranged from 0 to 19 years, with 91% of fish less than eight years old in both 2000 and 2001 surveys. There were peaks in abundance at five years of age (1995 year class) in 2000 and six years of age (1995 year class) in 2001 (Figure 7).

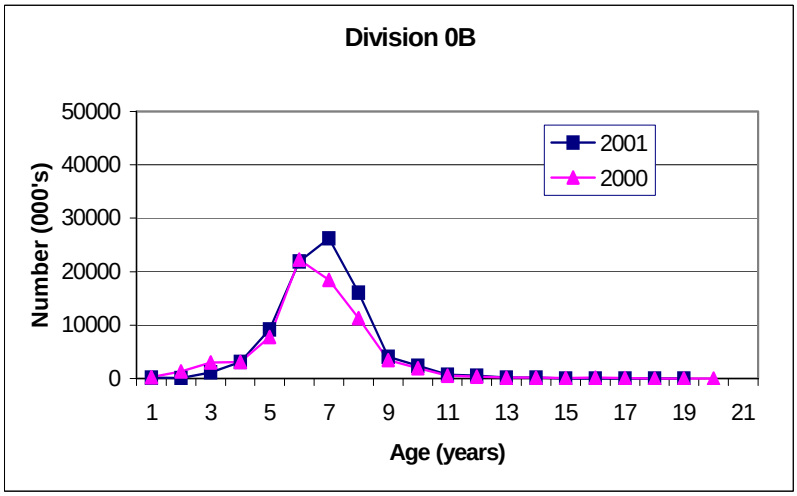


Figure 7: Abundance at age for Greenland Halibut from Division 0B surveys conducted in 2000 and 2001.

Division 0A

A stratified random otter trawl survey covering depths from 400 m to 1500 m was conducted in Division 0A from September 16 to 23, 2001 (Figure 5). Estimated biomass increased from 83,000 tons in 1999 to 97,627 tons (SE 14,069) in 2001. This latter figure may be underestimated by approximately 13,000 tons, because eight planned strata could not be sampled. Densities were highest within the 751 to 1000 m depth strata, averaging 3.3 tons per km^2. Total estimated abundance in 2001 was 142.7 million fish (SE 21.8 million), only a slight increase over the 1999 estimate of 140.1 million fish.

Lengths of fish caught ranged from 10 cm to 99 cm, with 68% of Greenland Halibut smaller than 45 cm. This length distribution in 0A was quite different from that found in 1999, when the distribution was broader, with greater abundance in 25 cm and 35 cm length classes as compared to 2001 (Figure 6). The 37 cm and 47 cm length classes were more abundant in 2001 than in 1999. There were fewer sets made in the shallow (<400m) strata in 2001 and this combined with the movement of the 1995 year-class through the population could explain the length frequency differences observed between these two years.

Ages ranged from 0 to 19 years, with a peak in abundance at five years (1996 year-class) for males and females combined (Figure 8). In the 1999 survey, ages ranged from 0-19 years and the peak abundance was at four years (1995 year class). The 1996 year-class rather than the 1995 year-class appears to be dominant in Div. 0A in 2001. However, there is a clear shift in the distribution to the right, with a larger number of age six fish in 2001 compared to 1999. Given the difficulties in ageing these fish, particularly as they get older, there is a chance a portion of the 1995 year class may be under-aged by one year, and recorded as the 1996 year-class.

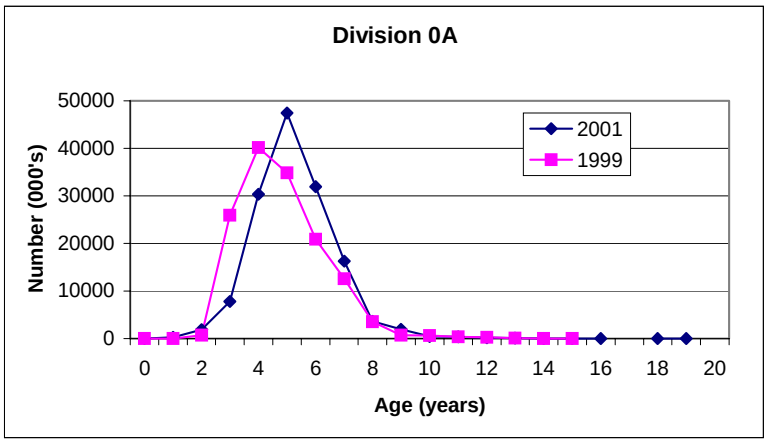


Figure 8: Abundance at age for Greenland Halibut from Division 0A surveys conducted in 1999 and 2000.

Although surveys were not conducted north of 71°30'N, exploratory fisheries in Division 0A show that Greenland Halibut are abundant along the coast of Baffin Island to 72 degrees North, and suggest Greenland Halibut are distributed throughout Baffin Bay.

0A and 0B Overall

Biomass and abundance were similar for 0A and 0B in the years surveyed, and appear to have increased slightly as compared to previous surveys. The percentage of fish <45 cm has decreased in both Divisions as compared to previous surveys, but it is still higher in Division 0A at 68.1%, compared to 46.8% in Division 0B. This overall decrease may be attributed to the reduced sampling of shallow water strata in 2001, and to the growth of fish in the dominant 1995 year-class. In both Divisions, there appears to be a broader size distribution for depths less than 750 m than is seen at greater depths (Treble 2002).

Subareas 0 and 1

Greenland researchers have conducted surveys in Divisions 1C and 1D each year since 1997, extending the survey into Divisions 1A and 1B in 2001. 2001 was the first year in which the entire 0 and 1 (Baffin Bay and Davis Strait) stock area was surveyed at once. Researchers found that densities and abundance of Greenland Halibut in both Subareas were very similar at comparable depths and areas (Figure 5). Overall, total biomass and abundance were nearly identical in the two Subareas. Length distributions were also similar in the two Subareas (Figure 9). The length distributions in Divisions 1C and 1D and 0B had modes of 45 cm and overlapped very closely.

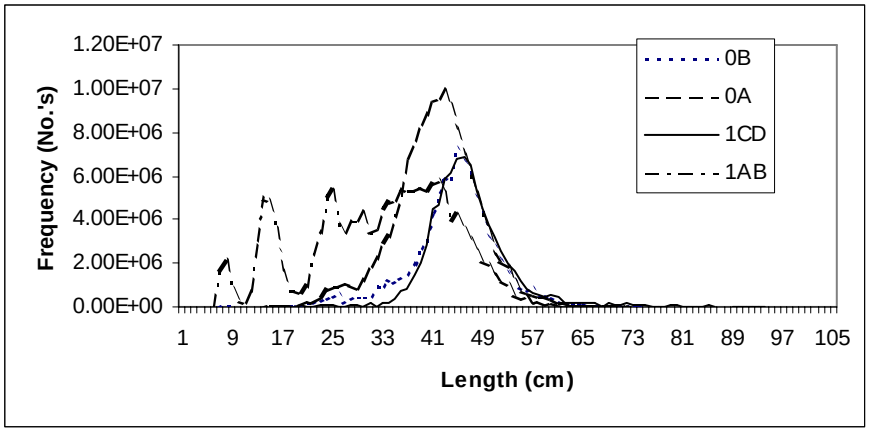


Figure 9: Estimated abundance at length for the Greenland Halibut population in NAFO Divisions 0A, 0B, 1AB and 1CD, 2001.

Length distributions differed between the more northern Divisions: a single mode was seen in 0A at 43 cm, while several modes were apparent in Divisions 1A and 1B: 8 cm, 15 cm, 25 cm, 30 cm and 42 cm. The smaller length modes in 1A and 1B were primarily from fish caught in shallower nursery areas (< 400m), and seem to reflect the three most recent year classes. Comparable shallow areas were not sampled in other Divisions.

Year-class strength data for Greenland Halibut caught in the GINR shrimp surveys show strong 1995 and 2000 year classes (Jørgensen 2002). Overall, Divisions 0A, and 1A and 1B contained large numbers of small fish (<45 cm) as compared to Divisions 0B and 1C and 1D.

It is important to remember that all biomass and abundance estimates are subject to error and variability. These estimates are based on the calculation of average catch from randomly selected locations within pre-determined depth strata. This average is then multiplied by the area within the strata and the results summed across all strata in the survey area. The final estimate can vary depending on how the depth strata are determined. For example, in 0A in 2001 biomass was estimated as 97,627 t using one depth stratum configuration and 83,458 t using another (Figure 10). Greenland Halibut are migratory and distribution is also known to vary seasonally; therefore, the survey catches can vary significantly from one year to the next even if the surveys are conducted in exactly the same areas and at approximately the same time each year. For example, the differences in biomass and abundance estimates for Divisions 1C and 1D between 2000 and 2001 were not significant (Figure 10). Therefore, although estimates of biomass and abundance of Greenland Halibut in Subarea 0 have increased since the last surveys, given the error involved in the estimates it cannot be concluded that stock biomass or abundance is increasing.

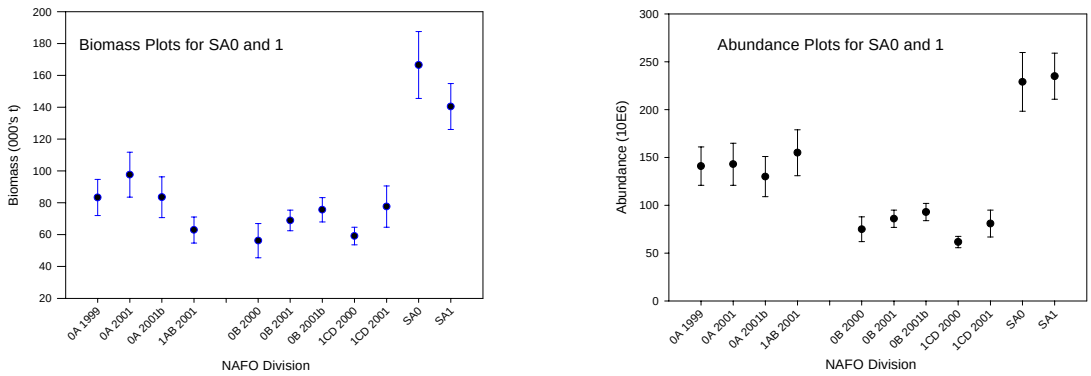


Figure 10: Biomass and abundance estimates with ± 1 standard deviation for surveys conducted in Divisions 0A, 0B, 1AB and 1CD during 1999 to 2001. Note there are two estimates from the data for Division 0A in 2001. The estimate for 0A 2001b is more directly comparable to the estimate for Divisions 1AB 2001 as they used similar depth strata configurations.

NAFO Scientific Council summarized stock status in Subareas 0 and 1 as follows:

1. Age composition in the catch remains stable.
2. A decline in the stock observed from 1987 to 1994 has stopped.
3. The stock in 'traditional' offshore fishing areas is at the level of the 1980s and early 1990s.
4. Biomass estimates from 0A and 1A are relatively high but cannot be put in any historical context due to lack of data.

NAFO Scientific Council advice for the management of the stock in Subareas 0 and 1 is:

1. Considering the relative stability in biomass indices and CPUE rates, the TAC should not exceed 11,000 tons for Division 0B and 1C-F. (2003 and 2004).
2. A catch of 8,000 tons for Division 0A and 1A,B should generate a relatively low fishing mortality rate. (2003 and 2004).
3. Biomass appears to be distributed approximately 50:50 between Subareas 0 and 1.

5.3 Scientific Research

DFO Research Plan

A. Surveys

It is proposed that, if funding is available, routine monitoring surveys be conducted in Division 0A and 0B either on an annual or on a bi-annual basis in order to provide fishery-independent information on the status of Greenland halibut Subarea 0. These surveys should be conducted in coordination with Greenland's surveys in Divisions 1CD.

B. Other DFO research

Samples collected during the three-year survey project initiated in 1999 and funded by DFO and the NWMB have been used for several scientific studies. All of them are ongoing and will continue for part or all of the duration of this management plan:

1) Greenland Halibut genetics study – conducted by Lianne Postma from DFO, with funding from the Nunavut Land Claim Implementation Fund.
2) Greenland Halibut food and feeding – conducted by Margaret Treble from DFO, with funding from DFO.
3) Greenland Halibut ecosystem assessment - conducted by Chandra Chambers, a University of Manitoba graduate student, with funding from DFO and several external sources.
4) Seabed classification and relationship to Greenland Halibut abundance - conducted by Craig Sheridan, a University of Calgary graduate student, with funding from DFO and several external sources.

In addition, DFO staff will continue to work on age validation techniques to improve Greenland Halibut age estimates for the duration of the management plan.

Further research needs

Scientists and biologists who study Greenland Halibut at various labs throughout the North Atlantic attended a workshop in 2000 where they reviewed the status of the research being conducted and discussed ways to work together to further our knowledge in high priority areas (Boje 2002b). Four research areas were identified:

1) Recruitment processes – to clarify the distribution patterns of recruits (eggs/larvae/juveniles) over time and space by preparing distribution maps of early bottom-dwelling life stages (ages 0-2) as well as case studies on larval fish and juvenile fish younger than age 1 (life stages that feed in the water column).

2) Age determination – methods to validate age estimates, for example tag-recapture information and chemical marking of otoliths, and methods to improve consistency of age readings by facilitating meetings and otolith exchange programs amongst otolith readers.
3) Stock delineation – particularly for two geographic areas, Baffin Bay and the East Iceland-Faroe Island areas. An offshore tagging project conducted in these areas or ideally throughout the North Atlantic could provide useful data on fish movements between areas. An offshore tagging project within Baffin Bay has been identified as a research priority but no proposals have been developed at this time. Some research to determine stock differences based on mitochondrial DNA methods has been conducted but results are preliminary and further work is required.
4) Reproductive processes – develop precise methods to estimate maturity stage by preparing standardized field guides and training on how to use them; determine location and timing of major spawning areas by developing area specific pilot studies to search for spawning locations.

6. Conservation Considerations

6.1 Total and fishing mortality rates

Estimates of fishing and total mortality rates for Greenland Halibut in Subarea 0 cannot be calculated on the basis of available data. NAFO recommended TACs are set on the basis of available stock biomass and population size structure, and are set at levels meant to ensure continued health of the stock and sustainability of the fishery. Current fishing mortality rates are not thought to be higher than the stock can sustain. However, much uncertainty exists regarding both stock biomass estimates and population age structure.

6.2 Spatial distribution of harvesting

As noted above, the Greenland Halibut in Subarea 0 are part of a much larger stock complex which includes inshore and offshore waters of Subarea 1. Harvest effort within Subarea 0 is based on NAFO quota recommendations. In 2002, harvesting in 0B was concentrated in the south-central portion of the Division, while harvesting effort was more widely distributed in 0A. (Figure 1). A large harvest (recommended TAC of 16,300t for 2003) of Greenland Halibut is taken inshore in Greenland's fjords, as part of a separate management regime for the inshore of Division 1A. Scientific research has shown that the Greenland Halibut found in these fjords do not contribute to offshore spawning stock, so that this fishery has no impact on the sustainability of the overall stock. The health of the overall stock does affect the sustainability of the 1A inshore Greenland Halibut, which are recruited from the offshore Baffin Bay and Davis Strait spawning stock. Results of inshore tagging efforts suggest that the same is true of some Greenland Halibut found in Cumberland Sound, which also appear to remain resident in the deep waters of Cumberland Sound (Treble 2003). This was the evidence used in establishing a separate management area in the inner portion of Cumberland Sound.

The only known conservation concern regarding the spatial distribution of harvesting relates to harvesting in the southeastern portion of 0A: there are narwhal overwintering grounds and rare deep sea coral in this area (see below under “Species and ecosystems of special concern”). Licence restrictions on vessels operating in this area are currently in effect.

6.3 Mature biomass and size and age compositions of catches

Fisheries and Oceans Canada has established a small fish protocol in the Atlantic fisheries which states that for Greenland Halibut, fish smaller than 45 cm should not comprise more than 15% of the overall catch. In the past, licence conditions for Greenland Halibut in Subarea 0 have included the requirement to move to new fishing areas if vessels encounter greater than 15% catches of small fish.

However, in the 0A Greenland Halibut fishery from 1996 to 2001, small fish comprised 27 to 50% of the overall catch. This problem can be attributed to two separate factors. First, in all of Subarea 0, there is an inconsistency between the minimum mesh size regulation of 145 mm and the small fish protocol: this mesh size is smaller than the size demonstrated to select for fish larger than 45 cm, thus often more than 15% of fish caught are smaller than 45 cm (see Aquaprojects Inc. 2002 for details on recent mesh selectivity experiments). Conclusive data on suitable mesh sizes for meeting the small fish protocol are not yet available. The second factor resulting in high catches of small fish is unique to Division 0A: approximately 70% of the fish in the surveyed areas of 0A are less than 45 cm, so vessels have found it almost impossible to find areas where they can adhere to the small fish protocol. In general, the lack of precise estimates of Greenland Halibut age and size at maturity in Subarea 0 makes prediction of the impact of fishing effort on future stock recruitment difficult (Morgan and Bowering 1997).

Because the average size of fish in 0A is smaller than in 0B, the same harvest level by weight has a more significant impact on the stock, as it removes a larger number of fish.

Available data suggest that the strong 1995 year-class in 0B is predominant in the fishery. As this year-class is fished and these fish move out of the fishable stock for natural reasons (mortality or migration), the fishery will likely rely more heavily on the strong 2000 year-class. This presents a concern because catches of small fish will increase, and it will become more difficult to adhere to the small fish protocol. Also, if another strong year class is not produced, it may be necessary to reduce fishing mortality substantially.

6.4 Non-catch mortality

Little is known about the potential effects of climate change on Greenland Halibut. It does appear that Greenland Halibut biological parameters have been resilient to change in the short term (country of Spain in Boje 2002b). However, climate change may have an impact on the currents that distribute larval Greenland Halibut onto shelf areas, and may therefore reduce the biomass and alter the location of the Subareas 0 and 1 stock. More research is needed.

Harp seal (*Phoca groenlandica*) and hooded seal populations are increasing. Since both species are predators of Greenland Halibut, these increases may have an impact on Greenland Halibut populations in future.

6.5 By-catch

Overall, by-catch in the Greenland Halibut fishery is relatively low. In the Division 0A fishery, which has consisted of otter trawling and longlining with 100% on-board observer coverage, 20 species or families were listed as by-catch by the observers in 2001. Most of these species occurred in amounts less than 1 ton. Greenland Shark was caught in 138 of 716 tows, for a total of 70 tons caught. Several skate species were also caught, including Arctic Skate (*Amblyraja hyperborea*), for a total of seven tons of skate by-catch. Roughhead Grenadier (*Macrourus berglax*) were also relatively abundant, with two tons recorded as bycatch. In Division 0B, observer coverage is incomplete, and both mobile and fixed gear are used. Observer data from Newfoundland vessels from 1998-2002 show Roughhead Grenadier to be the most common bycatch species at an annual mean of 21 tons, followed by skate species at four tons and Roundnose Grenadier and Atlantic Halibut at three tons each.

Although caught in very low numbers, a few by-catch species are currently of special conservation concern: the Roundnose Grenadier (*Coryphaenoides rupestris,* 0B only), the Northern Wolffish (*Anarhichas denticulatus*), and the Spotted Wolffish (*Anarhichas minor*). The Northern Wolffish and Spotted Wolffish are listed as threatened species by COSEWIC, and are discussed below under species and ecosystems of special concern.

6.6 Species and ecosystems of special concern

Roundnose Grenadier

This species is in the northern margin of its range in 0B. Recent surveys in Subarea 0 detected Roundnose Grenadier only in Division 0B, with biomass estimated at 1,256 t and abundance estimated at 7.87 million. NAFO Scientific Council has recommended that there be no directed fishing of this stock (Anonymous 2002), while the FRCC has recommended that:

(1) there be no directed fishing for Roundnose Grenadier in Subarea 0 in 2003/2004 and
(2) there be a restrictive by-catch fishery only. (Fisheries Resource Conservation Council 2003)

Wolffish

Wolffish species were by-caught in 8 sets in the 0A fishery in 2001, for a total of 57 kg. Northern Wolffish and Spotted Wolffish made up 32 kg of this number.

The Northern Wolffish and Spotted Wolffish have been designated as threatened species and as required under the *Species at Risk Act*, recovery plans are being drafted. Greenland Halibut licence conditions will require (a) the issuing of incidental harm permits; and (b) that measures established by recovery plans be followed. These

recovery measures include the live release of wolffish, or the retention of wolffish for the purpose of scientific study.

Beluga

Beluga in Cumberland Sound have been designated as endangered. The current winter long-line fishery does not appear to negatively affect the beluga population. However, increased ship traffic in Cumberland Sound has the potential to disturb Cumberland Sound beluga, particularly if the existing plant facilities at Pangnirtung are expanded. If gillnets are used in areas frequented by beluga, the potential for beluga entanglement exists. Last, as beluga feed on Greenland Halibut, the Greenland Halibut fishery may compete with beluga for prey.

Narwhal

DFO Science Central and Arctic Region established fishing licence restrictions in the southeastern portion of Division 0A in 1998. This area has been identified as a narwhal overwintering area. The licence restrictions limit the time spent by vessels (all gear types) in this area, in order to protect narwhal habitat and forage species.

Bowhead

Bowhead in the eastern Arctic have been designated endangered. Areas of concern include the bowhead's summer range in Cumberland Sound, migration routes in Baffin Bay, and wintering grounds in Davis Strait (Finley 2001). As is the case for beluga, increased fishing activity and vessel traffic in these areas could increase the risk of net entanglement and noise disturbance. These impacts should be assessed if fishing activity increases.

Cold water corals

Cold water corals have only recently been identified in Canadian fishing areas of the North Atlantic, and little is known about their general biology, population status, and role in the benthic ecosystem. However, corals have been identified in the areas used by overwintering narwhal, and these and other corals may require conservation measures.

Ecosystems of concern

The areas identified as narwhal habitat are the same areas in which cold water corals have been identified, suggesting productivity at these sites is exceptionally high (M. Treble, pers. comm.). Future management measures may include the identification of these areas as an ecosystem meriting special consideration and protection.

6.7 Role of Greenland Halibut in ecosystem

Current scientific information does not allow for a clear assessment of the role of Greenland Halibut in the larger ocean ecosystem in Divisions 0A and 0B. It does appear that Greenland Halibut are especially plentiful in the identified narwhal overwintering and cold water coral areas, and may be an important component of the narwhal diet. There

is a need for a clearer understanding of this and other ecosystem interactions, and the incorporation of this understanding into fisheries management.

6.8 Gear impacts

Different gear types have been shown to have different impacts on age composition of catches in Subareas 0 and 1 (Jorgensen 2002). In 2001, long-line gear caught fish with a mode at 7 years, and as old as 18 years. Trawl gear caught a larger percentage of younger fish, also with a mode at 7 years, but very few fish older than 9 years. Gillnets caught older fish, with a mode of 10 years and ranging to 15 years old.

Different gear types can also have different by-catch rates (as percent of overall catch). Preliminary data for the 0B fishery shows that from 1998-2000, fixed gear had lower by-catch rates than did mobile gear, while in 2001 and 2002 mobile gear had lower by-catch rates.

Different gear types also have different habitat impacts. The impacts of trawling on ocean-bottom habitat are not clearly understood. The Department continues to study the impacts of all gear types on habitat and has instituted appropriate measures where required.

Gillnets present a risk of net entanglement for whales. There are beluga, narwhal and bowhead whale populations in Subarea 0, and the potential for net entanglement is a concern. Areas of particular concern include Cumberland Sound, where all three species can be found, the deeper waters (500-1500 m) of Baffin Bay where narwhal are known to overwinter, and bowhead wintering grounds in Davis Strait.

7. Fisheries Management Objectives

The following conceptual objectives were identified by stakeholders at the management plan review meeting held in Iqaluit January 29-30, 2003:

Biological

1. Improve scientific knowledge of the Greenland Halibut stock.
2. Based upon scientific knowledge and the precautionary approach, maintain a healthy Greenland Halibut stock.
3. Minimize harvest of small fish, as defined by the small fish protocol.
4. Operate consistently with Species at Risk legislation.
5. Protect critical habitat and ecosystems (e.g. narwhal overwintering areas and deep water corals).

Socio-economic

6. Full Canadianization of the Greenland Halibut fishery.
7. Priority for majority Nunavutization of this resource over an acceptable period of time.
8. Develop a healthy and sustainable fishery.

9. Recognize participants who have developed this fishery to its current status through historic fishing investment and contribution to science.

As stated in the Preamble of this management plan, and consistent with the objectives stated above, the Conservation Principle is the main principle guiding the management of the Subarea 0 Greenland Halibut fishery.

8. Management Measures

Table 4: Subarea 0 Greenland Halibut management measures.

Management issue	**Previous management measures**	**Management measures under this management plan**
Conservation concerns		
Small fish and size composition of catches	Small fish protocol in Conservation Harvesting Plans: small fish <45 cm could constitute no more than 15% of catch by number. Ships were required to move from areas in which they caught more than 15% small fish. Gear restrictions (see below). Management plan specified minimum 10 day closures, with test fisheries to be conducted after 10 days (all costs borne by industry), when the number of undersized fish reached or exceeded 15% of the catch. ---	Conservative TAC in 0A. Measures to minimize the harvest of small fish <45 cm. Encourage use of long-line vessels in 0A. Further research on mesh selectivity. Further research on ageing techniques size at sexual maturity and frequency of spawning. Gear restrictions (see below).
Uncertainty in stock biomass estimates	--- Conservative TAC in 0A.	Ongoing Science surveys. Conservative TAC in 0A.
Spawning stock		Onboard observers for all vessels operating January to April inclusive (outside traditional fishing season). All onboard observers will look for evidence of spawning from December through May.

Species of conservation interest		
Wolffish (by-catch) Northern wolffish – (*Anarhichas denticulatus*) Spotted wolffish – (*Anarhichas minor*)		Incidental harm (Section 73) permits are required under the Species at Risk Act. Every person on board a fishing vessel who incidentally catches either of these two species while conducting fishing activities **must** return these species to the place from which they were taken, in a manner that causes them the least harm. There is a requirement to collect and report information about these species to DFO. Schedule 1 of the permit(s) outlines these reporting requirements.
Cumberland Sound beluga	Onboard observers required to report cetacean sightings.	Possible licence restrictions in Cumberland Sound may be required under SARA. Onboard observers required to report cetacean sightings.
Narwhal overwintering grounds and deep sea corals	Licence restrictions in narwhal overwintering area. Maximum of four days of fishing per vessel in the area bounded in the south by latitude 67° 15' N, in the north by latitude 68° 15' N, in the east by the NAFO Division 0A boundary and in the west by a straight line running from 59° 30' W to 60° 30' W. Onboard observers	Licence restrictions in narwhal overwintering area. Maximum of four days of fishing per vessel in the area bounded in the south by latitude 67° 15' N, in the north by latitude 68° 15' N, in the east by the NAFO Division 0A boundary and in the west by a straight line running from 59° 30' W to 60° 30' W. Onboard observers

	required to report cetacean sightings.	required to report cetacean sightings and corals found in catch.
Bowhead	Onboard observers req'd to report cetacean sightings.	No change.
Roundnose Grenadier		No special measures required.
Atlantic Halibut	Release of all Atlantic Halibut < 81 cm (32").	No change.
Other by-catch	For vessels over 100', 10% maximum weekly bycatch for any groundfish not under quota management. For 65'-100' vessels, 10% bycatch limit for closed species monitored daily. Release of prohibited species required in licence conditions.	10% maximum per trip bycatch of non-directed species for all vessels. Release of prohibited species required in licence conditions.
<u>Enforcement measures</u>		A detailed enforcement plan is being developed. It will include the following:
Dockside monitors	In Nunavut, industry-funded onboard observers act as dockside monitors. To date coverage has been 100%. Outside Nunavut, industry funds 100% dockside monitoring of all catches.	No change.
Observer coverage	0A:100% observer coverage, sea day costs funded by industry 0B: 100% coverage for mobile gear, sea day costs funded by industry 20% coverage on fixed gear, sea day costs funded by industry. Mobile gear vessels 65-100' must notify observer company six hours prior to sailing.	Same requirements as previously plus additional requirement for 100% observer coverage January to April inclusive for all vessels in 0B. All vessels must notify observer company six hours prior to sailing.

Hails	Daily hails of position and catches to licensing office are required for all vessels.	No change.
Logbooks	Accurate fishing and production logbooks required for all vessels, as well as submission of purchase slips to licensing office.	No change.
Additional enforcement	Air surveillance, patrol vessel surveillance, dockside inspections.	Air surveillance.
Other management issues		
Unsurveyed areas in 0A	---	New exploratory fishery in unsurveyed areas north of 71 30' (2003; maximum possible catch level or number of fishing days yet to be determined), to be developed consistent with DFO's policy on emerging fisheries.
Use of foreign vessels	Nunavut interests have chartered some foreign vessels in the developing 0A fishery in both 2001 and 2002.	The Minister of DFO has approved the use of two foreign longliners in Division 0A in 2003.
Seismic work	---	Communication with Greenland to ensure no seismic work takes place near vessels fishing in Canadian waters. DFO will notify the Fishing Industry of proposed seismic work in SA0.
Gear restrictions	Minimum gillnet mesh sizes of 153 mm for water depths less than 730 m and a minimum of 190 mm in depths greater than 730 m, with a maximum of 500 nets of 50 fathoms each. Long lines are restricted to a minimum hook size of #14 circle. Otter trawl minimum of 145 mm diamond or 155 mm square.	No change.

Gear conflicts in 0B	Prior to September 30 there is no restriction on where fixed gear vessels can fish in 0B. After September 30 gillnets are restricted to fishing in 0B north of 63°10' and longline vessels are restricted to the same area or in water depths greater than 750 fathoms.	No change.

9. Financial Responsibilities

Industry bears the full sea day costs of onboard observers, costs of contracts for dockside monitors, and costs of travel to, and accommodation at, public fora regarding the fishery. Industry participants also pay licence fees before commercial licences are issued.

The Department of Fisheries and Oceans Canada is responsible for the normal operating costs associated with landings monitoring, management, and surveillance of the fishery. In addition, DFO bears the internal costs of administration of the onboard observer and dockside monitor programs, and the costs of consultation with resource users and stakeholders in public fora.

For the last several years, DFO has partnered with other groups to fund scientific research on Greenland Halibut in Subarea 0. In 1999-2001, the Nunavut Wildlife Management Board contributed funds, along with DFO and several outside funding sources, to complete a three-year scientific survey project on Greenland Halibut in Subarea 0.

10. Performance Review

10.1 Management Plan Evaluation Criteria

The following general criteria will be used to evaluate the effectiveness of this management plan:

1. Success of implementation of management measures by DFO and adherence of fishery participants to fishery management plan requirements and license conditions.
2. Effectiveness of management measures in meeting management objectives, including
- maintenance of a healthy Greenland Halibut stock; and
- maintenance of a healthy fishery with socio-economic benefits accruing to Nunavut and Canada.
3. Catch to quota ratio.

10.2 Post seasonal analysis recommendations

The turbot review and management planning meeting held in Iqaluit January 29-30, 2003 addressed a number of management issues. Consensus was not achieved on all issues. The following commitments and general recommendations resulted from the meeting:

1. Further scientific research on Subarea 0 Greenland Halibut is needed.

2. A precautionary approach and sustainable harvest level should be adopted.

3. Canadianization and Nunavutization of the resource should remain important priorities.

4. Canada should take a “major share” of Subarea 0+1 (offshore) NAFO Greenland Halibut quota.
    - DFO and the Minister will determine the details of this major share
    - Industry submissions to DFO are welcome
    - Future science may shed light on this issue

5. In Division 0B, the full 5500t quota should be fished in the offshore. The Cumberland Sound fishery should be managed separately from the offshore, with a separate quota allocation on top of the 5500t for Division 0B. A summer inshore fishery in Cumberland Sound may be developed as an exploratory fishery, in order to gather information on available biomass and reasonable harvesting rates and locations. However, this is subject to input from NAFO Scientific Council.

6. The management plan should be in effect for three years or less, due to the uncertainty surrounding sustainable harvest and due to growth and change in the Greenland Halibut fishery.

7. The current seasonal approach to resolve conflicts between fixed and mobile gear should remain unchanged.

8. Not enough information is available to limit fishing seasons and locations to protect spawning grounds. For those fishing outside traditional times of year (i.e. January to April), there will be a requirement for 100% observer coverage. DFO Science (Central & Arctic Region) will work with on-board observers to collect data upon which to base further discussion of possible seasonal closures or other spawning protection.

9. Licence restrictions in narwhal overwintering areas will remain in place and be enforced.

10. Species at Risk Act obligations will be met, and the fisheries management plan will include a provision stating that future management requirements for species at risk will take precedence as required by legislation.

11. All participants in the fishery will continue to work to meet the small fish protocol as part of licence requirements. DFO will work for a better scientific assessment of size and age at maturity.

12. Limitations on participation established in 2000 for the 0B competitive fishery will remain unchanged.

13. Observer coverage will continue as is, with better coordination of data collection with DFO.

14. Mobile and fixed gear competitive quotas should not be split into enterprise allocations.

15. Seismic work will not occur near fishing boats: DFO will inform the fishing industry of any seismic surveys to take place in Subarea 0 well in advance of the fishing season, and ensure that seismic companies are aware of the time and location of fishing activities in this area.

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Annex I: DFO Roles, Responsibilities, and Contacts

DFO Roles and Responsibilities for Greenland Halibut in Subarea 0

Central and Arctic Eastern Arctic Area Office (Iqaluit)

Fisheries Management
- Writes Fisheries Management section of Fisheries Management Plan
- Issues licenses
- Collects harvest statistics (from daily hails, weekly onboard observer reports, captain's fishing logs, dockside monitor reports, and final observer trip reports), verifies consistency between data sources, and enters data in Area, Regional, National and NAFO databases
- Advises on appropriateness of management options

Conservation and Protection
- Determines the enforceability of management measures
- Identifies any potential enforcement problems to be addressed in plan
- Suggests specific enforcement measures
- Ensures that enforcement measures identified in the plan can be realized within existing resources
- Develops, carries out and evaluates enforcement plan
- Develops Conservation Harvesting Plans for relevant fleets in cooperation with resource users

Habitat Management
- Identifies threats to stocks and their habitats
- Advises on management options

Area Director
- Coordinates consultations with resource users and other stakeholders
- Coordinates the pre/post season processes

Central and Arctic Regional Headquarters (Winnipeg)

Resource Management and Aboriginal Affairs
- Coordinates the development of management options between DFO sectors and with resource users and other stakeholders
- Coordinates or drafts the FMP
- Ensures that provisions of the Nunavut Land Claim agreement are met
- Incorporates advice from the Nunavut Wildlife Management Board in FMP
- Advises on appropriateness of management options

Science
- Provides stock forecast for upcoming season
- Risk Analyses
- Indicates conservation concerns
- Advises on appropriateness of management options with respect to conservation
- Specifies data requirements
- Conducts and advises on research projects required for stock assessments

- Monitors Division 0A fishery using Observer data

Oceans
- Responsible for informing Resource Management about initiatives under the Oceans Act (e.g. MPAs, ICZM) which might have implications for the plan

Communications
- Assists in the posting of completed plans on internet, along with Informatics
- Assists in the announcement of approved plans

Policy and Economics
- maintains Regional database and produces harvest reports in cooperation with Area office

Finance
- Reviews FMP, and ensures that financial aspects of plan are in order

Newfoundland and Labrador Regional Headquarters (St. John's)

Resource Management
- Advises on appropriateness of management options
- Issues licenses for Newfoundland quota allocations
- Collects harvest statistics and enters data in Regional, National, and NAFO databases
- Enforcement activities

Science
- Works with Central and Arctic Science on appropriateness of management options with respect to conservation
- Collates and verifies Observer data for Division 0A from Quebec Region and Newfoundland and Labrador Region and forwards it to C&A Science
- Monitors 0B fishery using Observer data
- Provides advice and other support as mutually agreed on research projects required for proper stock assessments

Maritimes Regional Headquarters (Dartmouth)

Licensing
- Issues licenses
- Collects harvest statistics and enters data in Regional, National, and NAFO databases

Science
- Collates and verifies Observer data for Division 0A and forwards it to C&A Science

National Headquarters (Ottawa)

Resource Management

- Advises on appropriateness of management options
- Develops Conservation Harvesting Plans for relevant fleets in cooperation with resource users
- Provides DFO advice and recommendations to the Minister

International

- With approval of other sectors, leads international negotiations concerning international shares of fish stocks
- Provides input on international obligations/concerns
- Responsible for advising on regulatory and policy issues tied to the FMP

Minister

- Approves management plan, total Division quotas, and non-Nunavut allocations

DFO Contacts

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Annex II: News Releases

NR-HQ-00-79E

Dhaliwal Announces Increased Turbot Allocation and Staff for Nunavut in 2001.

August 16, 2000

IQALUIT -- The Honourable Herb Dhaliwal, Minister of Fisheries and Oceans, today announced that Nunavut will receive all of the Canadian quota of turbot recommended by the Northwest Atlantic Fisheries Organization (NAFO) Scientific Council in the Davis Strait (Division 0A) next year.

The Scientific Council has recommended an additional TAC be implemented for the offshore area of Divisions 0A+1A with a catch of up to 4,000t in 2001. The quota for Division 0A will be established separately from NAFO Division 0B, which is traditionally fished by Nunavut interests as well as fishermen from other provinces. Turbot in Divisions 0A and 0B will be managed as separate units in 2001.

Since 1996, Nunavut interests have conducted an exploratory fishery in Division 0A with a maximum harvest level of 300 tons. This additional quota will permit the Nunavut to expand the current exploratory fishery.

"I am very pleased to provide Nunavut fishers with increased fishing opportunities to harvest turbot next year," Mr. Dhaliwal said. "This allocation will be over and above current allocations to Nunavut interests in Division 0B in 2001. The 5,500 tons, which are available in the southern part of this area, will not be affected by this new quota nor will the historical interests of the other parties who currently fish there."

Bilateral discussions with Greenland will be undertaken later this year to determine the sharing arrangement of the 4,000t of turbot for Divisions 0A and 1A for 2001. Subarea 0A is in Canadian waters and 1A is in Greenland waters.

"Providing Nunavut with 100% of the Canadian allocation in 0A next year will permit the continuation of the exploratory fishery on an expanded basis," Mr. Dhaliwal added. "As the NAFO Scientific Council has noted, the relationship between Greenland Halibut in both 0A and 1A, and other areas of Subarea 0 and 1 is unknown and needs to be thoroughly investigated."

Canada and Greenland are currently partnering a survey, to be completed in 2001, to study the turbot biomass in the north. Information from the expanded exploratory fishery and the survey will assist in determining the relationships of turbot in the various Divisions in the north.

"With this new fishing opportunity, I am also pleased to announce a 25% increase in DFO staff in Nunavut. The additional resources will contribute to the effectiveness of DFO programs and initiatives, including the development of new and existing fisheries," Mr. Dhaliwal added. DFO staff levels in Nunavut will increase from 12 to 15 employees in 2001.

NR-HQ-02-137E

Thibault Responds to the Report of the Independent Panel on Access Criteria

November 8, 2002

OTTAWA -- The Honourable Robert G. Thibault, Minister of Fisheries and Oceans, today responded to the Report of the Independent Panel on Access Criteria (IPAC), and praised the panel for bringing greater clarity to the complex issue of policy governing access to increasing fisheries.

"The work of the IPAC has resulted in significant progress with the introduction of a formal framework of principles and criteria to guide new access decision-making in increasing Atlantic fisheries," Minister Thibault said.

The IPAC made seven recommendations. The first three related to the principles and criteria that should guide decision-making for increasing Atlantic commercial fisheries. The other four recommendations addressed the decision-making process, expansion of the Fisheries Resource Conservation Council (FRCC)'s mandate, greater access for Nunavut interests to their adjacent fisheries and promoting Aboriginal involvement in access decision-making processes.

"The feedback I received as I contemplated my Response to the IPAC Report reinforced the Report's conclusion that there is no magic formula, and no widely accepted solution, to the challenge of determining who will receive access to increasing commercial fisheries," the Minister added. "Following careful deliberation and extensive consultation, I am accepting the principles and criteria recommended and defined by the IPAC as the basis for the Department's "New Access Framework", which will guide decision-making for increasing fisheries."

The IPAC recommendation that no additional access be granted to non-Nunavut interests in waters adjacent to the new territory until Nunavut has achieved access to a major share of its adjacent fishery resources has also been accepted. With respect to the recommendation regarding Aboriginal participation in access decision-making processes, Minister Thibault said: "This is consistent with Fisheries and Oceans' intent to work more closely with Aboriginal peoples on fisheries matters."

In response to the IPAC recommendation regarding the access decision-making process, the Minister indicated that Fisheries and Oceans would continue to focus on successful existing mechanisms for access decision-making. He also indicated that a separate review of the mandate of the FRCC would take into consideration the findings of the IPAC.

In preparing its Report, the IPAC sought input from industry, Aboriginal organizations, the Atlantic provinces, Quebec and Nunavut. It conducted 66 meetings and wrote to 205 individuals in order to solicit input and comments on access decision-making issues in increasing Atlantic commercial fisheries.

Minister Thibault made a special point of thanking the IPAC members, his provincial and territorial counterparts, industry members, Aboriginal organizations and others who provided valuable input into this process.

The IPAC is a component of the broader and more comprehensive Atlantic Fisheries Policy Review (AFPR), which will put in place a clear and consistent policy framework to serve as the foundation for the long-term, sustainable management of the Atlantic fisheries. The Minister's Response to the IPAC Report will be incorporated into the AFPR.

The members of the IPAC consisted of Mr. Arthur Kroeger (Chair), Dr. Paul LeBlond, Professor Martha Jackman, Dr. Gordon Munro and Professor David Newhouse.

NR-HQ-05-23E

Regan Announces Establishment of New Greenland Halibut (Turbot) Management Zone in Cumberland Sound

April 26, 2005

PANGNIRTUNG – The Honourable Geoff Regan, Minister of Fisheries and Oceans, today formally announced his acceptance of the Nunavut Wildlife Management Board's (NWMB) decision that a new Greenland halibut (turbot) management zone be established for Cumberland Sound with a Total Allowable Harvest (TAH) of 500 tons.

"Creation of a new fishery management zone in Cumberland Sound is an important development for fishers from Nunavut," the Minister said. "It means an additional allocation of 500 tons of turbot for them."

The Minister said he had also accepted a decision by the NWMB allowing for an exploratory fishery to be carried out in the area adjacent to the new zone in Cumberland Sound, in Division 0B. He indicated that the amount of fish that could be caught in such an exploratory fishery would be part of Nunavut's existing allocation for turbot in Division 0B. As well, the Minister accepted the NWMB decision, which addressed concerns expressed by the Pangnirtung Hunters and Trappers Organization, that offshore vessels not be used in Cumberland Sound. Offshore vessels are 65 feet (19.8 meters) or more in overall length.

In accordance with the three-year fishery management plan that is now in place, the Canadian turbot quota for Division 0A will be 4,000 t this year, all of which has been allocated to Nunavut interests. For Division 0B, the Canadian quota will be 5,500 t, with 1,500 t allocated to Nunavut interests, 1,500 t to competitive fisheries and the remaining 2,500 t allocated to the six companies that are involved in this fishery. The allocation of 500 t for Cumberland Sound is separate from these quotas.

The Minister will review any recommendations that he may receive from the NWMB for in-season adjustments to the management plan for the Division 0A turbot fishery.

As 2005 is the final year of the current, three-year fisheries management plan, consultations with stakeholders and the NWMB about the management plan for the Sub-Area 0 turbot fishery in 2006 and beyond will begin in the fall. This is in accordance with the department's announcement of March 2005 that it is moving towards stable and durable access and allocation processes for the Atlantic region.

The Minister said the department is committed to providing Nunavut interests with increased allocations in waters adjacent to the territory over time, while also taking in to consideration the interests of other participants in these fisheries.

Annex III: Iqaluit Turbot Review and Recommendations

Agenda

Location: Parish Hall beginning 8:30am both mornings

1. Opening of Meeting
- Introduction by Chair
- Adoption of agenda

2. Science (M. Treble)
- Ecosystem/habitat description
- Results of recent science research
- surveys in Subareas 0+1
- Cumberland Sound tagging study
- Science recommendations for 2003 and future science initiatives

3. Inuit Qaujimajatuqangit (IQ)
- Relation to turbot management issues

4. International
- Report on bilateral discussions with Greenland (January 13-14, 2003) (K. Ditz)

5. Review of Current Management Plan
- Allocations in 0A and 0B (B. Lester)
- Catches 1998-2002 (B. Lester)
- Overview of the 0A fishery (W. Fillatre)
- Challenges
- By-catch and Species at Risk (M. Treble/K. Ditz)
- Harvests of small fish (M. Treble)
- Narwhal over wintering areas (M. Treble)
- Cold water corals (M. Treble)
- Ageing (M. Treble)
- Gear conflicts/current seasonal approach (B. Lester/G. Brocklehurst)
- Limitations on participation (B. Lester/G. Brocklehurst)
- Observer coverage, enforcement (W. Fillatre/G. Brocklehurst)
- Special requests (B. Lester/G. Brocklehurst)
- Splitting of the mobile gear competitive quota into EAs for >100'
- Splitting of fixed gear competitive quota <65', 65-100' and >100'

6. Recommendations for Management Plan for 2003 and beyond
- Objectives for the fishery (A. Roburn)
    - Biological
    - Socio-economic
- Canadian quotas for Divisions 0A and 0B for 2003 (B. Lester/B. Hunt)
- Future Management plan development (B. Hunt)
- Length of future plan
- Management measures
- Gear conflicts/ seasonal approach

- Fishing restrictions in narwhal over wintering areas
- By-catch/ Species at Risk
- Small fish protocol
- Limitations on participation
- Observer coverage, enforcement
- Special requests
- Splitting of the mobile gear competitive quota into EAs for >100'
- Splitting of fixed gear competitive quota <65', 65-100' and >100'
- Other
- Spawning closures
- Seismic work

7. Next Steps

Meeting Participants

Name	Organization	Name	Organization
Stephan Kilabuk	NTI	Jim Short	Dominion Trading
Peter Keenainak	Qikiqtaaluk Corp	Morrissey Kuniliusie	Nativak HTO
Brian Lester	DFO - Ottawa	Yukipa Audlakiak	Nativak HTO
Gary Brocklehurst	DFO - NFLD/Lab	John Andrews	Davis Strait Fisheries
Isac Killikti	BFC	Grant Stonehouse	Davis Strait Fisheries
Manasie Audlakiak	BFC	Winston Fillatre	DFO Iqaluit
Jerry Ward	BFC	Keith Watts	Labrador Inuit Asssoc.
David Alexander	BFC	Ray Croft	Sun Voyager Fish.
Russell Chislet	Kabva (m)	Jim Noble	NWMB
Jacopie Maniapik	Pang Fishery & BFC	Ben Kovic	NWMB
Michael P. Novinski	Pang Fisheries	Martine Giangioppi	DFO Iqaluit
Livee Kudlualik	Pang HTO	Ingrid R. Anand	DFO Iqaluit
Carey Bonnell	DSD, GN	Beverly Sheppard	HR Grace Shrimp
Joopa Sowluapik	CS Fisheries	Rex Simmonds	NFLD Tradition
Rick Selleck	Senate of Canada	Jeff Simms	Newfound Resources
Harry Earle	Terra Nova Trading	Brian McNamara	Newfound Resources
Karen Ditz	DFO Iqaluit	Raymond Ningeocheak	2nd VP, NTI
Margaret Treble	DFO Science Wpg	Ken Fowler	HAB Shrimp Co.
Audrey Roburn	DFO Wpg	Phil Quinlan	HAB Shrimp Co.
John Andrews	Arctic Harvesters Inc	David Coffin	Fisheries & Aquaculture
David Middleton	Seafreeze Foods Inc	Trevor Decker	Trinav Consultants
Karl Sullivan	Barry Group/Seafreez	Glenn Penney	GF Penney Inc
Christine Penney	Clearwater		