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Fishery Management Plan

Greenland Halibut

**NAFO Subarea 0
2006-2008**

Canada

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1. Executive Summary

Preamble

This document outlines management approaches for the 2006 through 2008 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 (see section 4.8) 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 February 2006 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 may be part of a larger stock complex that extends south to the waters of the continental slope of Labrador and the outer Grand Bank east of Newfoundland (NAFO SA2 and 3) and east to Greenland (SA1) and Denmark Strait (ICES XIVa and b and Va) (Boje 2002a). The extent of mixing or migration of fish between these areas is not known. Greenland halibut in the fjords of northwestern Greenland (Boje 2002a) and Cumberland Sound (Treble 2003) appear to be resident in these fjords, and once they have migrated from offshore nursery areas to the fjords, they do not appear to intermingle with populations in the offshore or more southerly fjords

Knowledge of Greenland halibut spawning and migration over the course of their life cycle is limited. It is possible that Greenland halibut are spawning at times of the year when they cannot be surveyed or fished because of sea ice. Females produce heavily-yolked eggs that result in large larvae with high survival rates (Boje 2002b). Larvae then drift for up to four months before they metamorphose into the bottom-dwelling life stage (Boje 2002b). Larger fish are found at greater depths and it is believed that the fish migrate off the banks shallow waters into deeper waters. Greenland halibut age and size at maturity vary widely over space and time (Morgan and Bowering 1997). Data from research surveys in 0A and 0B show that the length at 50% maturity for females in 0A was greater than 80 cm for both 1999 and 2004 and for 0B it was 62 cm in 2000 and 67 cm in 2001 (Morgan and Treble 2006).

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, capelin and on northern shrimp where these are abundant. Larger Greenland halibut (>60 cm) feed mostly on other fish, preferring larger species such as redfish and grenadiers and occasionally deepwater squids. Seven distinct groups of fish species have been described for the Baffin Bay and Davis Strait area. Greenland halibut are common throughout all seven areas but the fish assemblages found in Division 0A and Division 0B are different from each other. This difference in species composition may be partially attributable to the differences in the ecosystems and environmental conditions in the two Divisions.

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 an exploratory fishery quota of 3,500t in 0A for 2001, increasing to 4,000t in 2002 and 4,400 t for 2003 to 2005. In 2006 the quota was further increased to 6500 t following a NAFO Scientific Council recommendation for an increase in TAC in Division 0A, 1A offshore and 1B to 13,000t. The 0A quota has been allocated to the Nunavut Wildlife Management Board (NWMB) who currently re-allocates it to Nunavut fishing interests at the request of the Minister. An inshore long-line under-ice fishery for Greenland halibut also exists in Cumberland Sound. A separate quota of 500 t was established for this fishery in December 2004 that includes provision for a summer fishery in the inner portion of Cumberland Sound. Other small inshore exploratory long-line under the ice fisheries have occurred in other areas of Nunavut over the years.

Stock Status

Estimated biomass for Division 0A south of 72° N increased gradually from 68,700 t (S.E. 18,263 t) in 1999 to 86,200 tons (S.E. 12,502 t) in 2004. Estimated biomass for Division 0A north of 72° N was estimated to be 45,877 t (S.E. 9,406 t). Total estimated abundance declined slightly over this period. In Division 0B, the biomass appears to have increased in 2001, with the biomass in the survey area estimated at 68,917 t, with a standard error (S.E.) of 6,523 t, as compared with 56,212 t (S.E. 10,813 t) in 2000. Total estimated abundance was 74.6 million fish (S.E. 12.7 million) in 2000, and 85.9 million (S.E. 8.7 million) in 2001. 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 have entered the fishery beginning in 2004.

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 February 2006 Subarea 0 turbot management plan review meeting:

A. Biological Objectives

1. Improve scientific knowledge of the Greenland halibut (turbot) stock.
2. Maintain a healthy Greenland halibut (turbot) stock through the use of science, Inuit knowledge the precautionary approach and discussions with other resource users.
3. Minimize harvest of small fish.
4. Operate consistently with the Species at Risk legislation.
5. Protect critical habitat, ecosystems and other species.
6. Collect and document Inuit knowledge of Greenland halibut (turbot).

B. Socio-economic Objectives

1. Develop and maintain a healthy and sustainable fishery.
2. As per the IPAC report, no additional access be granted to non-Nunavut interests in adjacent waters until Nunavut has achieved access to a major share of its adjacent fishery.
3. Adopt the principles and criteria from the IPAC report for decision making in fisheries allocations.
4. Maximize economic benefits for Nunavut from its adjacent fisheries.

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.

The Precautionary Approach (DFO 2006) is a general philosophy to managing threats of serious or irreversible harm where there is scientific uncertainty. A precautionary approach is applied in fisheries management to reduce the likelihood of unacceptable outcomes. This means that potentially unacceptable outcomes must be clearly identified, risks evaluated, and appropriate steps must be taken to reduce the likelihood of their occurrence. Under the precautionary approach, avoidance of potential unacceptable outcomes must take precedence over other objectives.

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 although this gear is currently not economically viable due to the short season and low catch rate. 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 prohibited species Atlantic halibut less than 81cm, Spotted wolffish and Northern wolffish are designated as “threatened” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). There are special management practices in effect such as the mandatory live release of wolffish. The Species At Risk Act (SARA) also prescribes the need for special permits to allow other activities to continue that may impact on wolffish. 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 restrict fishing in these areas.

In order to gather information necessary to protect spawning fish, observers are required on all vessels operating January to April inclusive to look for evidence of spawning. Onboard observers are required to report all 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.

The separate management area of Cumberland Sound is subject to appropriate management measures developed in cooperation with established co-management partners (e.g. Pangnirtung HTA, NWMB) and the community of Pangnirtung.

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 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) 1993, 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 Nunavut settlement Area (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;
 - (c) approve plans for management and protection of particular wildlife habitats including areas within Conservation Areas, Territorial Parks and National Parks;

- (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.

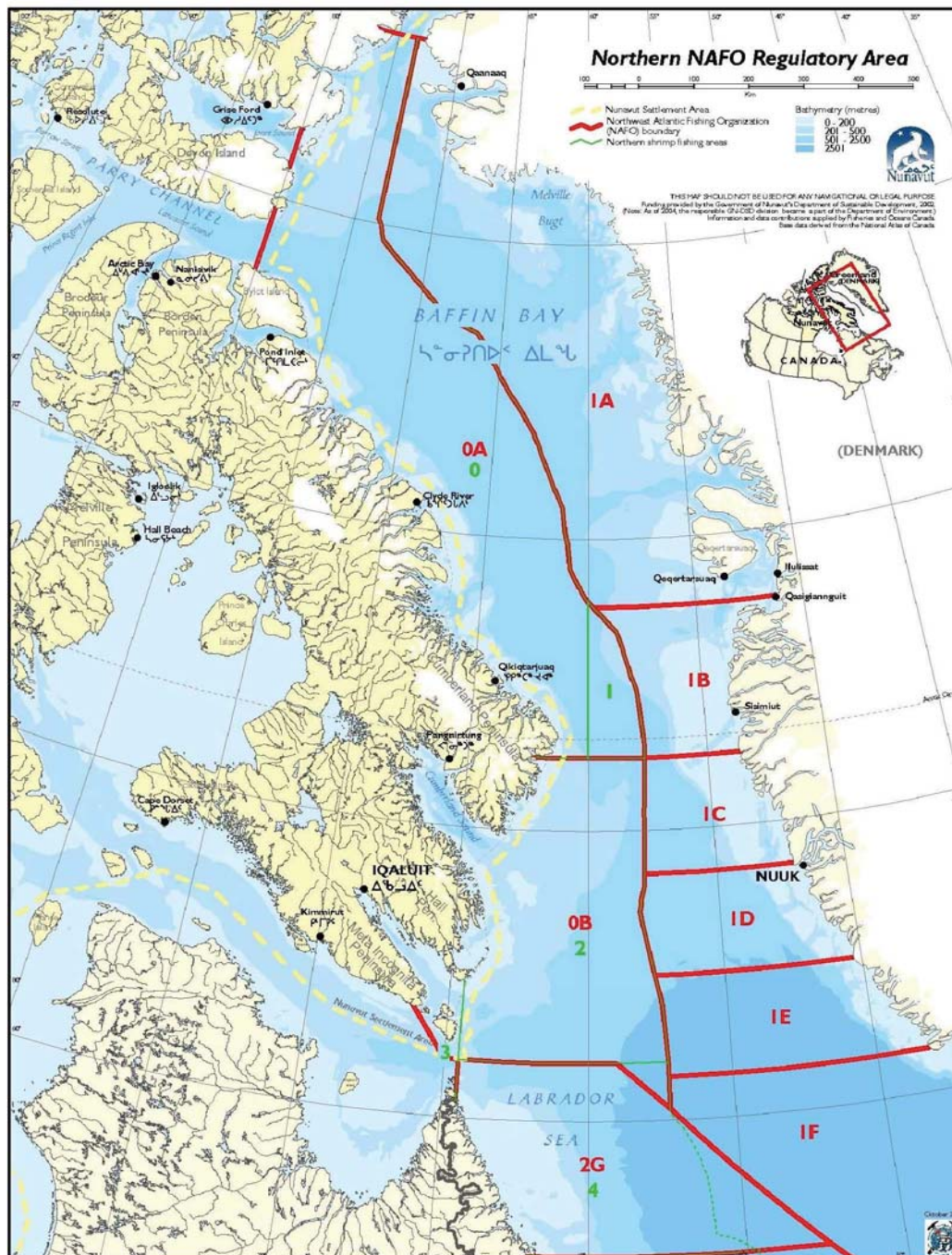


Figure 1. Northern NAFO Regulatory Area showing Subarea 0 and Divisions 0A and 0B.

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. 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, shared stewardship and an appropriate regulatory framework.

Shared stewardship will be achieved by promoting collaboration, participatory decision-making and shared responsibility and accountability with resource users and others. Enabling resource users to play a greater role in decision-making, and enabling them to take greater responsibility for resource management decisions and their outcomes will increase their commitment to conservation and their ability to control their economic and social well-being. Achieving shared stewardship among participants requires a stable and transparent access and allocation approach, where access and allocation of fisheries resources will be more stable and predictable, and decisions will be made and conflicts resolved through fair, transparent and rules-based processes.

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

With the inception of the separate management zone for the Cumberland Sound inshore area in 2005, this management plan will not contain management and conservation measures specific to that management area that will be dealt with in a separate management plan.

This management plan is in effect until December 31, 2008. 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 the left eye migrates across the top of the larva's skull, positioning itself close to the eye on the right 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 may be part of a much larger stock complex. This stock complex extends south to the waters of the continental slope of Labrador and outer Grand Bank east of Newfoundland (NAFO Subarea 2 and Divisions 3KLMNO) and east into Greenland waters (NAFO Subarea 1) and Denmark Strait (ICES Divisions XIVa and b and Va) (Boje 2002a), 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 2500km 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).

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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. In spring of 2005, the separate management unit for Greenland halibut in the inner portion of Cumberland Sound was completed.

Knowledge of Greenland halibut spawning is limited. The proportion of females found in spawning condition in catches or in surveys is greater in Davis Strait than in Baffin Bay (Morgan and Treble 2006, Simonsen and Gundersen 2005). Several theories as to why this occurs have been put forward by Simonsen and Gundersen (2005): 1) Greenland halibut conduct spawning migrations from Baffin Bay to Davis Strait; 2) there is local spawning with an extended adolescent phase and/or multi-year maturation cycle that might explain the large proportion of fish classed as immature; and 3) a majority of fish in Baffin Bay never enter a spawning phase due to a lack of energy surplus caused by harsh environmental conditions. Research into Greenland halibut maturity and life-history is still required.

The Baffin Bay-Davis Strait stock is thought to originate primarily in the deep-water (800-2000 m) 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). Canadian surveys and Canadian fishing operations have caught maturing fish in late fall but have not encountered aggregations of spawning fish, possibly because spawning is occurring in the very deep waters of the Labrador Sea beyond the range of fishing gear or the large spawning fish are able to escape the survey trawl gear. 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. In addition the proportion of spawners in the population may be low and they do not form large spawning aggregations (Junquera et al. 2003 and Simonsen and

Gundersen 2005). 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). Females produce relatively few eggs (6,100-188,400 eggs/female in a recent study [Gundersen 2002]); instead, they produce heavily-yolked eggs that result in large larvae with high survival rates (Boje 2002b). Larvae studied off west Greenland fed primarily on copepod plankton found in the top 100 m of the water column near the slopes of the bank or at the shelf break area (Simonsen et al. 2006).

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). The length at which 50% of sampled fish were mature in NAFO Divisions 3KLM in 1991, 1994 and 1995 deepwater surveys ranged from 63 cm to 99 cm for females, and from 51 cm to 63 cm 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. Length of females at 50% maturity was measured at 69 cm for fish caught in the 1993 0B deepwater gillnet fishery (Morgan and Bowering 1997). Data from research surveys in 0A and 0B during 1999 to 2001 show that the length at 50% maturity for females in 0A was greater than 80 cm for both 1999 and 2001 and for 0B it was 62 cm in 2000 and 67 cm in 2001 (Morgan and Treble 2006). However, given the temporal variability of such estimates, they cannot be extended to represent average length at maturity for female Greenland halibut in Subarea 0.

From 1999 to 2001 the majority of Greenland halibut caught in 0A surveys were smaller than those found in 0B. This suggested that fish in 0A may grow more slowly due to environmental constraints or that 0A may be a rearing ground for juveniles, which migrate into 0B and the Labrador Sea once they grow bigger. However, when 0A was surveyed again in 2004 the proportion of larger fish had increased and was similar to that seen in 0B in 2001. The reason for the increase in length observed in 0A from 1999 to 2004 is not known but it may be due to an increase in growth of one or two strong year classes. The link between fish stocks in 0A and 0B requires further study.

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 (Darby et al. 2004). This equates to 10 to 20% of the population per year. The Greenland shark (*Somniosus microcephalus*) and narwhal (*Monodon monoceros*; Laidre et al. 2004) 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).

Seven distinct groups of fish species have been described for the Baffin Bay and Davis Strait area based on data of species abundance and distribution collected during bottom trawl surveys conducted in 2001 (Figure 2, Jørgensen et al. 2005). Greenland halibut are common throughout all seven areas but the fish assemblages found in Division 0A and Division 0B are different from each other (Table 1). 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). These environmental differences may have an affect on the growth and reproduction of Greenland halibut found there.

Table 1. Ten most common species caught in otter trawl surveys conducted in NAFO Divisions 0A (1999) and 0B (2000). The four species that were present in both areas are highlighted and marked with an asterix.

0A	Occurrence (no. sets/65)	Total Abundance (all sets)	0B	Occurrence (no. sets/66)	Total Abundance (all sets)
Turbot*	65	11935	Turbot*	66	5545
Snailfish	62	432	Roughhead grenadier	51	718
Threebeard rockling*	54	527	Deepwater redfish*	46	4276
Glacier lanternfish*	47	630	Threebeard rockling*	40	176
Arctic cod	32	10516	Giotre black smelt	36	821
Eelpout	31	105	Blue hake	34	491
Arctic skate	28	169	Glacier lanternfish*	32	397
Deepwater redfish*	24	976	Longnose eel	31	199
Hookear sculpin	17	100	Lantern fish	29	672
Mailed sculpin	14	230	Roundnose grenadier	28	540

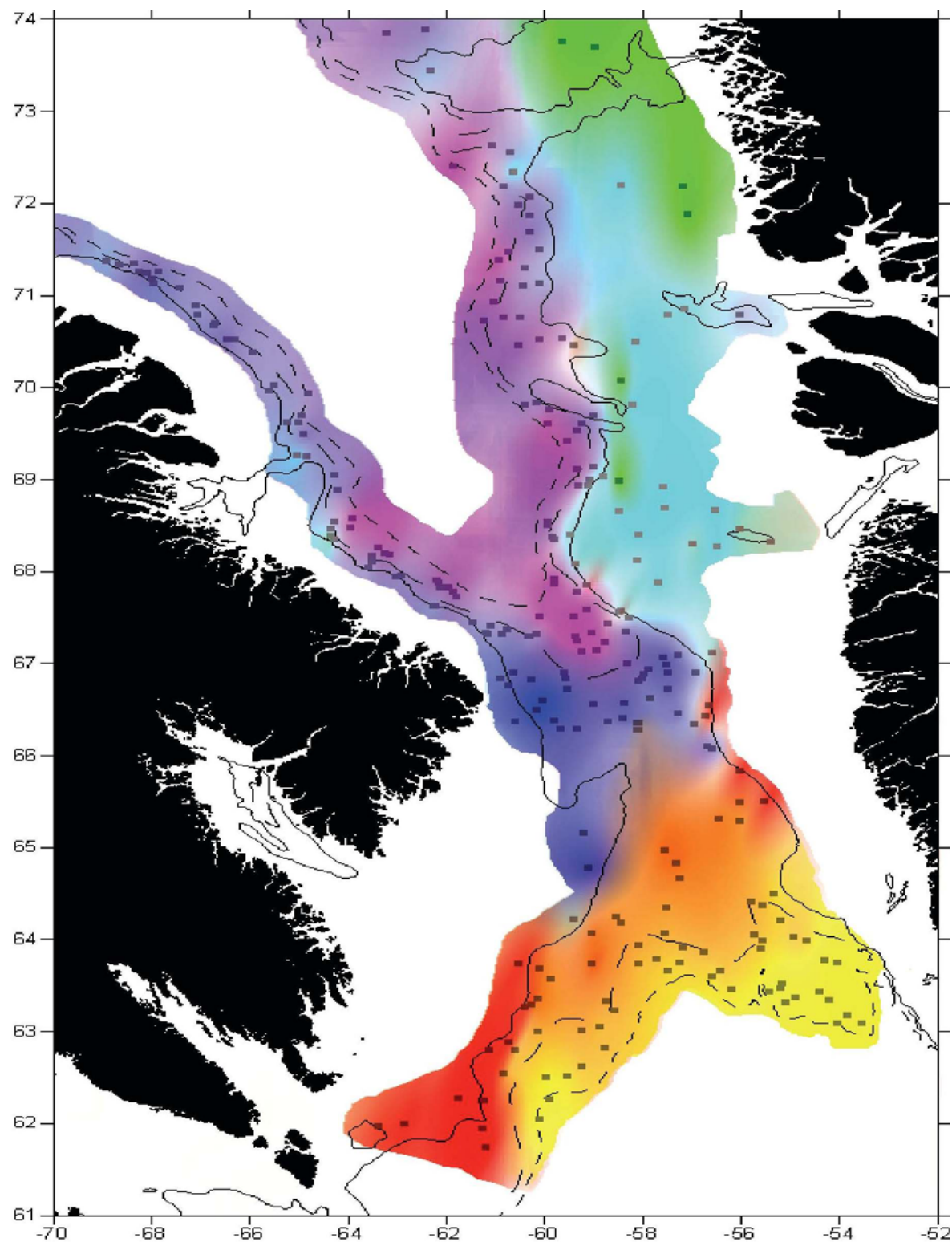


Figure 2. The spatial distribution of the seven different demersal fish stock assemblages (from Jørgensen et al. 2005).

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 and 1A offshore + 1B in the north, and 0B/1C-F in the south. (From June 2000 to 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.

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 currently 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. Conditions improved in 2002 and 2003 and effort increased resulting in catches exceeding 200 t, however since then conditions have been poor and 2005 was the shortest fishing season on record with only 2 weeks where ice conditions were safe for fishing. A separate quota of 500 t was established for this fishery in December 2004 that includes provision for a summer fishery in the inner portion of Cumberland Sound.

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. In 2001, Canada established an exploratory fishery quota of 3,500t in 0A, increasing it to 4,000t in 2002 and to 4,400 t for 2003 to 2005.

In 2005, NAFO Scientific Council recommended an increase in TAC for 0A and 1A (offshore) + 1B based on data from surveys in new areas in 2004. For 2006, the recommended TAC was 13,000t for 0A and 1A (offshore) + 1B; an increase of 5000t.

Nunavut feels that being the primary jurisdiction adjacent to Subarea 0 and with its historical attachment and economical dependence on the fishery, their access and allocation should be 80%-90% to this adjacent resource.

Table 2 summarizes the development of the fishery over time.

Table 2. Subarea 0 Greenland halibut fishery development history.

1981 – 1991	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 100t Nunavut inshore allocation introduced in 0B (within the Nunavut Settlement Area).
1990	<ul style="list-style-type: none"> 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 inshore allocation increased to 500t.
1992	<ul style="list-style-type: none"> Developmental allocation increased to 10,460t. Nunavut inshore allocation increased to 1,000t.
1993	<ul style="list-style-type: none"> Developmental quota reduced to 3,920t. Introduction of 6,540t competitive quota for Canadian licence holders.
1994	<ul style="list-style-type: none"> Significant reduction in TAC following NAFO Scientific Council advice. Competitive allocation eliminated. Nunavut allocation remained constant.

1996	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Access to competitive fishery restricted to those groundfish license holders who had historically participated in the fishery.
2001	<ul style="list-style-type: none"> • New 0A exploratory fishery allocation of 3500t. This was provided exclusively to Nunavut interests.
2002	<ul style="list-style-type: none"> • Increase in 0A exploratory allocation to 4000t all of which was provided to Nunavut interests. • Final year of 1998 management plan.
2003	<ul style="list-style-type: none"> • 3 year Management Plan announced (2003-2005). • A 10% quota increase was granted and an additional 400t was allocated for the offshore in 0A
2004	<ul style="list-style-type: none"> • A 10% quota increase was granted and an additional 400t was allocated to BFC for offshore in 0A
2005	<ul style="list-style-type: none"> • The 10% quota increase in 2005 was reserved for inshore fisheries development. The limited success of the inshore fishery allowed for the remaining quota to be moved to the offshore fishery. • A separate zone was set for the Cumberland Sound inshore fishery with a 500t quota. • The NAFO Scientific Council recommended that for 2006 the TAC for 0A and 1A offshore + 1B be increased to 13,000t. • Final year of the 2003 management plan.

4.3 Participants

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

In Division 0A, the entire quota is currently allocated to the NWMB. The NWMB provides this allocation primarily to the BFC but to other Nunavut fishing interests as well, they in turn may allow non-Nunavut fishing companies to harvest portions of the quota in exchange for royalty fees. Since 2004, all vessels in the 0A fishery have been Canadian.

In Division 0B, the quota is split between competitive quotas (1,500t), company allocations (2,500t), and a Nunavut allocation (1,500t). In 2000, the competitive quotas for groundfish license-holders were limited to historical participants. They include vessels from the Maritimes region and from Newfoundland. The competitive quota is split 900t for fixed gear license holders and 600t for mobile gear license 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 company’s holding company allocations in 0B, none of the companies with company allocations in 0B receive licenses to participate in the competitive fishery. All vessels in the 0B fishery are Canadian.

Table 3a. History of Subarea 0 quotas from 1981 through 1995

Subarea 0 Canadian Greenland Halibut Quota History						
	1981-1989	1990-1991	1992	1993	1994	1995
0A (see note)						
Nunavut						
Total 0A	0	0	0	0	0	0
0B						
Foreign Charters	12,400	6,640	1,040	1,040	4,500	4,500
Developmental/ Company Allocations	0	5,360	10,460	3,920		
Nunavut	100	500	1,000	1,000	1,000	1,000
Competitive (see note)	0	0	0	6,540	0	0
Total 0B	12,500	12,500	12,500	12,500	5,500	5,500
TOTAL	12,500	12,500	12,500	12,500	5,500	5,500
Note • 0A fishery was only established in 1996 • Competitive allocation split between fixed gear (900t) and mobile gear (600t)						

Table 3b. History of Subarea 0 quotas from 1996 through 2005.

Subarea 0 Canadian Greenland Halibut Quota History							
	1996-2000	2001	2002	2003	2004	2005	2006
0A							
Nunavut	300 exploratory	3,500	4,000	4,400	4,400	4,400	6500
Total 0A	300	3,500	4,000	4,000	4,400	4,400	6500
0B							
Foreign Charters							
Developmental/ Company Allocations	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Nunavut	1,500	1,500	1,500	1,500	1,500	1,500	1500
Competitive (see note)	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Total 0B	5,500	5,500	5,500	5,500	5,500	5,500	5500
TOTAL	5,800	9,000	9,500	9,900	9,900	9,900	9,900
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, warmer weather and 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. Small exploratory fisheries in other inshore areas within the NSA (Clyde River and Pond Inlet) have been undertaken in recent years.

4.5 Landings*Division 0B*

The 0B fishery took a total of 5656t, 5649t and 5907t of Greenland halibut in 2003, 2004 and 2005 respectively.

Division 0A

The 0A fishery is an exploratory fishery. From 2003 to 2005, 4142t, 3753t and 4268t of Greenland halibut were harvested in this fishery. Small fish make up 20% of the overall catch in Division 0A in 2004.

Quotas and catches from 1987-2005 for Subarea 0 are summarized in Table 4a and b. Catches by gear type are shown in Figure 4.

Table 4a. Subarea 0 Greenland halibut quotas and catches (1987-1995).

Area and Fishery	1987	1988	1989	1990	1991	1992	1993	1994	1995
0A									
Canadian Quota	0	0	0	0	0	0	0	0	0
Total 0A	0	0	0	0	0	0	0	0	0
0B									
Total allowable Catch	12500	12500	12500	12500	12500	12500	12500	5500	5500
Foreign Quota (NAFO)	9500	9400	6800	6600	5600	0	0	0	0
Canadian Quota	3000	3100	5700	5900	6900	12500	12500	5500	5500
Foreign Catch	830	1288	1059	2527	3319	536	0	0	0
Developmental	0	0	0	6431	6058	8266	*7289	4343	3919
Nunavut Inshore	4	11	180	255	147	430	425	400	285
Nunavut Offshore	0	2	0	0	0	1020	20	0	407
Competitive	0	0	0	0	0	0	*799	0	736
Total 0B (Foreign + Canadian)	834	1301	1239	9213	9524	10252	8533	4743	5347
Total Canadian Catch	4	13	180	6686	6205	9716	8533	4743	5347

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

Table 4b. Subarea 0 Greenland halibut quotas and catches (1996-2005).

Area and Fishery	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0A											
Canadian Quota	----	----	----	----	----	3500	4000	4400	4400	4400	6500
Nunavut Exploratory Catch	329	241	42	*0	320	2625	3800	4142	3753	4268	6634
Total 0A	329	241	42	*0	320	2625	3800	4142	3753	4268	6634
0B											
Total allowable Catch	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500
Foreign Quota (NAFO)	0	0	0	0	0	0	0	0	0	0	0
Canadian Quota	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500	5500
Foreign Catch	0	0	0	0	0	0	0	0	0	0	0
Developmental	2501	2538	0	0	0	0	0	0	0	0	0
Company Allocation ≈			1628	1995	2733	2974	2144	3489	3876	2972	2891
Nunavut Inshore F	60	66	63	34	45	80	108	242	61	9	70
Nunavut Offshore €	1417	1446	1720	1568	1043	1017	918	800	208	1230	1218
Competitive	1561	2078	1731	1991	1439	928	867	1123	1504	1653	1423
Total 0B (Foreign + Canadian)	5539	6128	5142	5588	5260	4999	4037	5654	5649	5826	5532
Total Canadian Catch	5834	6331	5184	5588	5580	7624	7837	9796	9402	10094	12166

* 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.

≈ Company allocation is 2500t although this fluctuates according to the amounts transferred from other quota holders in 0B.

F A separate quota of 500t was set for the Nunavut inshore fishery in 2005. Prior to 2005, the catches from the inshore were deducted from the offshore quota.

€ Catches shown are for quota that remained in Nunavut. Nunavut quota holders at times transferred parts of their 0B quota to Company allocation quota holders in 0B.

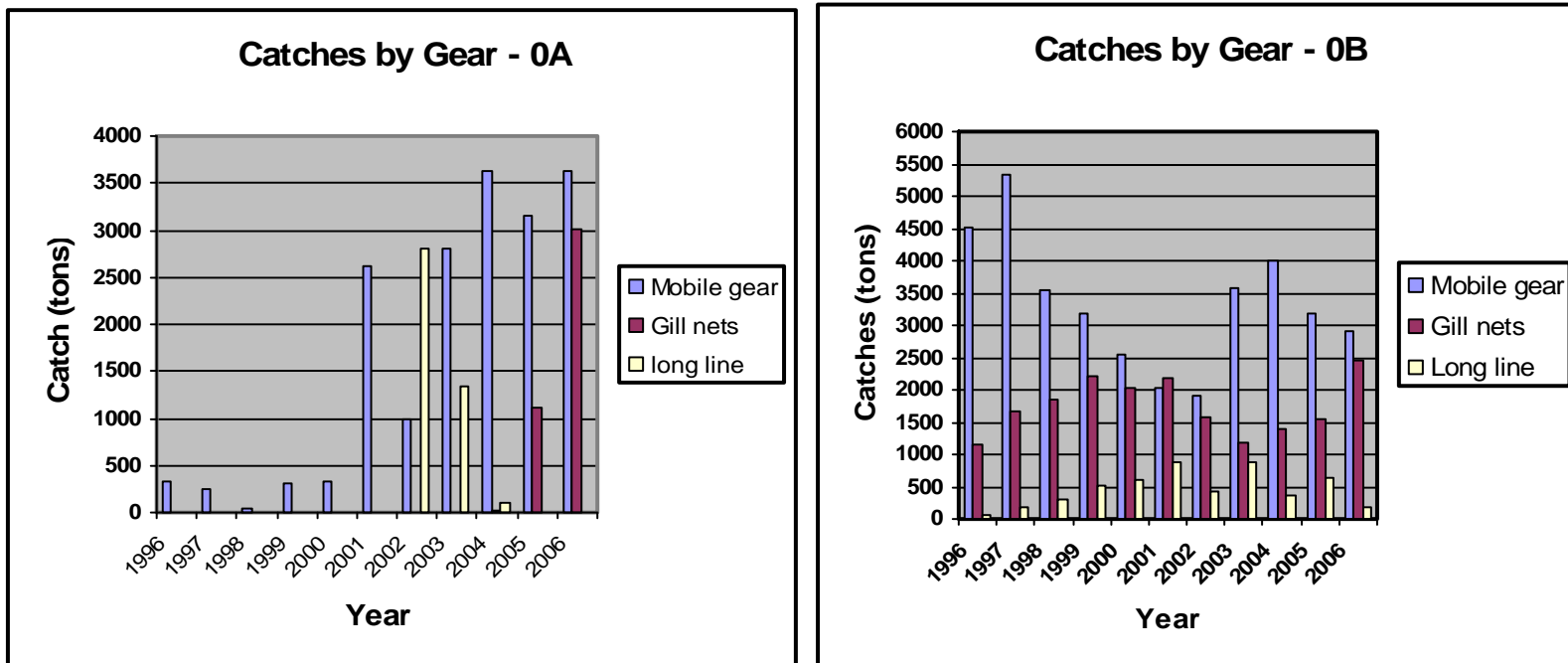


Figure 3. Subarea 0 Greenland halibut catches by gear type (1996-2005).

* Data for catches by gear type in 0B from 1996 to 1999 may contain inaccuracies.

4.6 Management Plan Development Process

This management plan was drafted following a consultation meeting with fishery participants and other stakeholders and the submission of comments. The meeting was held in Iqaluit, Nunavut, February 7 and 8, 2006. 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 February 2006 meeting and a list of meeting participants are included in Annex III.

The draft management plan was reviewed by resource users and stakeholders. The draft was summarized and presented to the Nunavut Wildlife Management Board because this plan is to be in effect within the Nunavut settlement Area (NSA) the NWMB must approve the plan. Following resource users, industry, and NWMB input and NWMB review and approval, the final draft plan is to be forwarded to the Minister of Fisheries and Oceans for approval.

4.7 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, bowhead whales 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.

4.8 Precautionary Approach to Fisheries

The Precautionary Approach (PA) (DFO 2006) is a general philosophy to managing threats of serious or irreversible harm where there is scientific uncertainty. A precautionary approach is applied in fisheries management to reduce the likelihood of unacceptable outcomes. This means that potentially unacceptable outcomes must be clearly identified, risks evaluated, and appropriate steps must be taken to reduce the likelihood of their occurrence. Under the precautionary approach, avoidance of potential unacceptable outcomes must take precedence over other objectives.

Harvest strategies are typically implemented by regulating the removal rate either by controlling total catch or by controlling fishing effort. Under the PA, fishery management plans should include harvest strategies that incorporate a Limit Reference Point, an Upper Stock Reference and a Removal Reference. Further, the management decisions must respect the indicated actions in each of the stock zones as follows:

- In the *Healthy* zone, the stock status is considered to be good. In this zone, the removal rate should not exceed the Removal reference.
- In the *Cautious* zone, fisheries management actions should promote stock rebuilding towards the Healthy zone. The removal rate should not exceed the Removal reference.

- The Removal reference should progressively decrease as the stock level approaches the Critical zone. For simplicity, Figure 2 shows a proportional reduction of removal rate with respect to stock level as a dashed line. Any progressively decreasing removal rate in the Cautious zone is permissible.
- In the *Critical* zone, the status of the stock has declined to such a low level that it is considered to be in a precarious state. In this zone, fishery management actions must promote stock growth. Removals by all human sources must be kept to the lowest possible level.

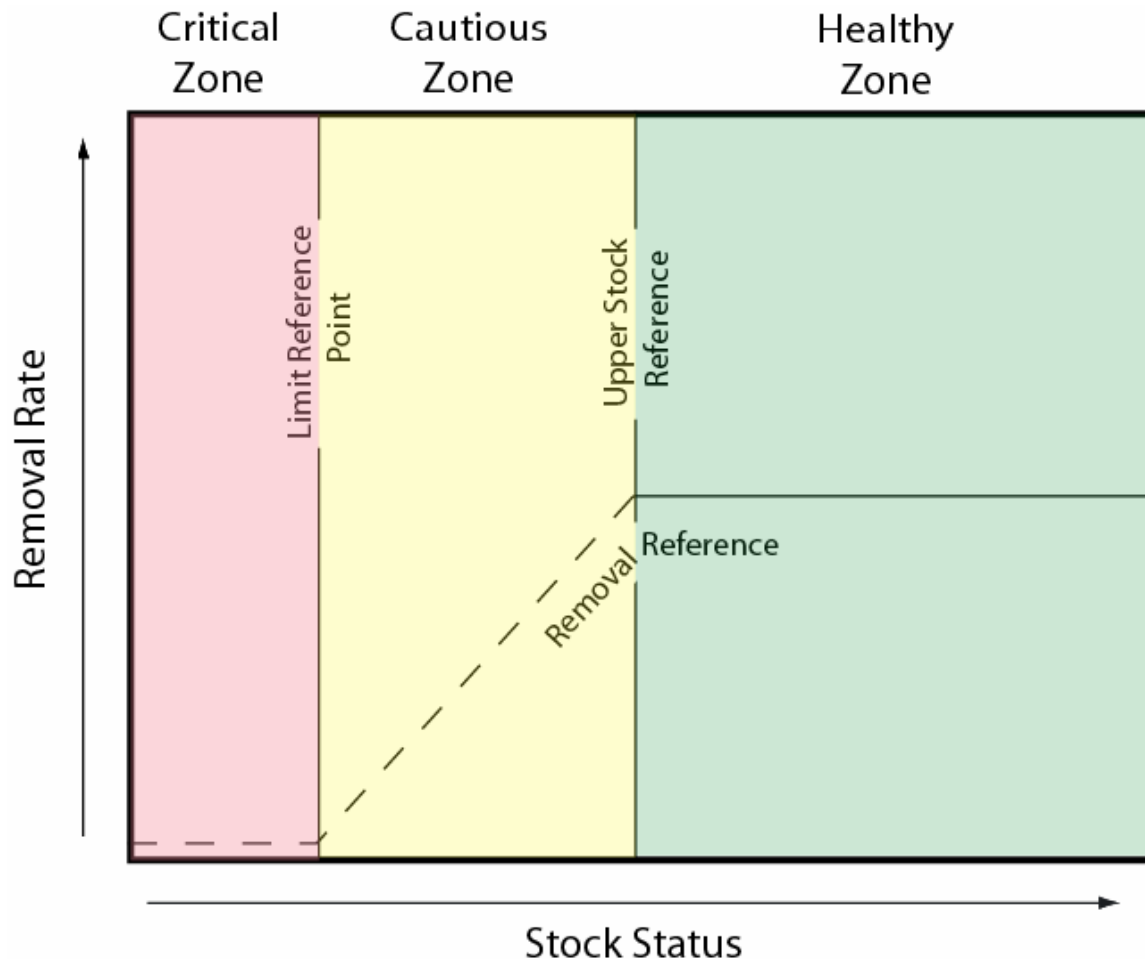


Figure 4. Fisheries management framework consistent with a precautionary approach.

The NAFO Scientific Council provides scientific recommendations for the Subarea 0 Greenland halibut fishery, at the request of Canada and Greenland, including a recommended Total Allowable Catch.

Scientific Council has developed a PA framework that includes a stock buffer zone and limit reference points similar to the DFO PA Framework described above. However, the reference points have not yet been developed for the SA0 and Division 1A (offshore) and Divisions 1C-F Greenland halibut stock.

The Conservation Principle

The challenge in defining conservation is to find the right balance between providing the economic and social benefits of harvesting a natural resource and the need to protect the resource itself. The Atlantic Fisheries Policy Framework defines the conservation principle as the cornerstone of fisheries management.

*“Conservation of fisheries resources and habitat—defined as sustainable use that safeguards ecological processes and genetic diversity for present and future generations— is the first priority of fisheries management decision making.”
(DFO) 2004)*

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.

Most of these management units are managed by whichever country 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 for Subarea 0 and Division 1A Offshore and Divisions 1B-1F

The biomass estimate for the annual Greenland survey in Div. 1CD increased in 2005 but it was not significantly different from the estimates for 1997 to 2004, while abundance in the 2005 survey declined slightly. The biomass estimate of Greenland halibut in the Greenland shrimp survey in 2005 was above average for the time series 1988 to 2005. Recruitment at age 1, estimated from the Greenland Shrimp surveys, has been above average in recent years (Jørgensen 2005a). The length at which 50 % of females were mature in Div. 0B was estimated from research trawl surveys and was 62 cm in 2000 and 67 cm in 2001 (Morgan and Treble 2006). Data from the Russian fishery in Div. 1D in 2005 estimated 50% of the females were mature at 62 cm in length. Catch rates in the fisheries have been increasing in recent years, 2002 to 2005, and have returned to a level observed in 1990-2001. Length distribution in the trawl

fisheries has been stable in recent years and in Div. 0A, 1A, and 1D showed modes around 48-51 cm in 2004 and 2005 (Jørgensen 2005a).

Analytical assessments have been tried but were found to be unsuccessful for this stock. Age based assessments may suffer from problems with the accuracy of age determinations. A Greenland halibut age determination workshop held in St. John's, Newfoundland in February 2006 concluded that the current age determination methods underage old fish and that Greenland halibut may live longer than previously thought. The workshop participants recommended that age validation studies be conducted for each stock area and that research continue to determine a more reliable and accurate age determination method (Treble and Dwyer 2006).

NAFO Scientific Council summarized stock status in June 2005 as follows:

Length compositions in the catches have been stable in recent years.

Based on survey indices from Div. 1CD the stock has been increasing since 1994 and is now at the level of the late 1980's and early 1990's.

NAFO Scientific Council advice for the management of the stock in 2006 was:

Considering the relative stability in biomass indices and CPUE rates, for Greenland halibut in Div. 0B and 1C-1F the TAC for 2006 should not exceed 11,000 tons

In 2002, Scientific Council advised a catch of 8,000 tons for the developing fisheries in Div. 0A+1A. Based on new surveys in 2004 in not previously surveyed areas in the northern part of Div. 0A and 1A Scientific Council advises that TAC in Div. 0A and Div. 1A offshore + Div. 1B for 2006 should not exceed 13,000 tons.

5.2 Results of scientific surveys

Division 0A

Stratified random otter trawl surveys covering depths from 400 m to 1500 m have been conducted in southern Division 0A, from the Div. 0B boundary north to 72°N, in 1999, 2001 and 2004. The biomass and abundance estimates reported in the previous management plan were recalculated due to a correction in the strata area. Estimated biomass increased gradually from 68,700 t (S.E. 18,263 t) in 1999 to 86,200 tons (S.E. 12,502 t) in 2004. . Densities were highest within the 751 to 1000 m depth strata. Total estimated abundance declined slightly over this period, 1.189×10^8 (S.E. 3.2×10^7) to 1.110×10^8 (S.E. 1.7×10^7).

Lengths of fish caught ranged from approximately 10 cm to 99 cm, with the modal length increasing from 39 cm in 1999 to 42 cm in 2001 and to 45 cm in 2004 (Figure 5). The percent of Greenland halibut in the survey smaller than 45 cm declined from 77% in 1999 to 57% in 2004.

The increase in the modal length and overall size of fish from 1999 to 2004, along with the increase in biomass and decline in abundance, suggests that one or more year classes (e.g. the 1995 year class) may have been dominant in the area during these years.

In 2004 a survey was conducted between 72° N and 76° N for the first time. Biomass and abundance were estimated to be 45,877 t (S.E. 9,406 t) and 4.85×10^7 (S.E. 9.0×10^6), respectively. Densities were highest between 500 m and 750 m depth strata. The length distribution for northern 0A ranged from 12 cm to 81 cm with two modes, one at 33 cm and a larger one at 48 cm (Figure 5). The percentage of fish less than 45 cm in the northern 0A survey was 36%.

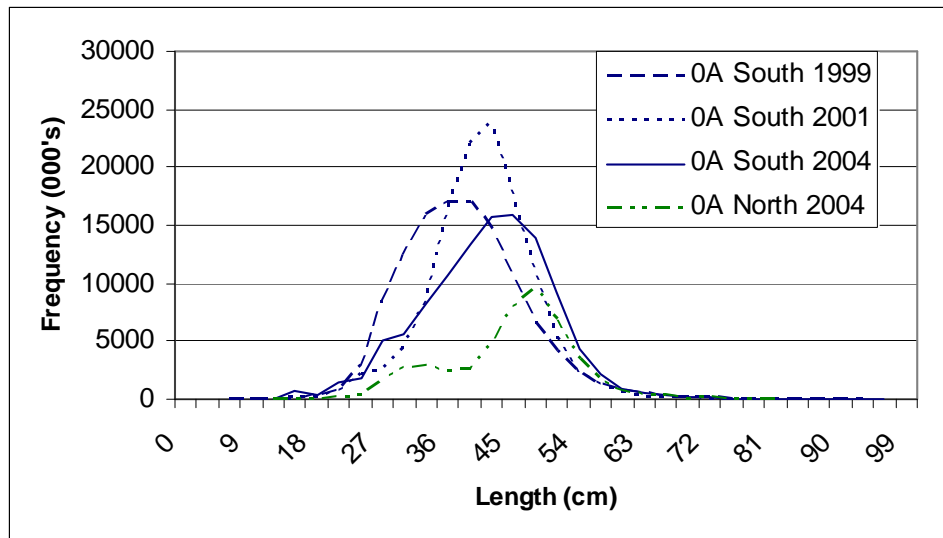


Figure 5. Estimated number of fish at each length for the Greenland halibut population in NAFO Divisions 0A surveys 1999-2004.

Division 0B

Stratified random otter trawl surveys covering depths from 400 to 1500 m were conducted in Division 0B in the fall of 2000 and 2001. Greenland halibut were caught in all tows, with the highest densities found 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 in 2001, with the biomass in the survey area estimated at 68,917 t, with a standard error (S.E.) of 6,523 t, as compared with 56,212 t (S.E. 10,813 t) in 2000. Total estimated abundance was 74.6 million fish (S.E. 12.7 million) in 2000, and 85.9 million (S.E. 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 there was a single length mode at 45 cm. The lack of a smaller length mode in the 2001 survey may reflect changing year-class abundance 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.

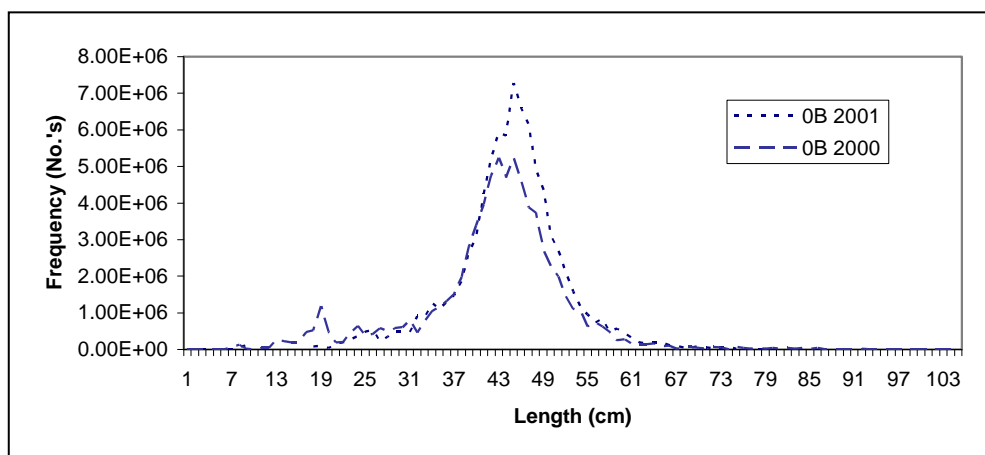


Figure 6. Estimated abundance at length for Greenland Halibut from surveys conducted in NAFO Division 0B in 2000 and 2001.

Subareas 0 and 1

Most of SA 0 and SA 1 have been covered by surveys conducted in 2001 and 2004. Div. 0A and the northern part of 1A and 1CD were surveyed in 2004 while Div. 0B and 1B and the southern part of 1A were surveyed in 2001 (Figure 7). The only area not covered in recent years is Divisions 1E and 1F, although the shallow shelf area (down to 600 m) within these divisions is included in the annual Greenland shrimp survey. Total biomass estimated for Subarea 0 is slightly more than that estimated for Subarea 1 (Table 4). These estimates do not include data from the shrimp survey conducted in 1 A-F.

Table 5. Biomass estimated (t) from various deep-sea surveys, all conducted by the same vessel and gear. Div. 0B and Div 1B-1A south of 73° N were estimated from surveys conducted in 2001, all the rest were from surveys conducted in 2004.

SA 0		SA 1	
Div. 0A north of 72°	45,877 (S.E. 9,405)	Div. 1A north of 73°	53,867 (S.E. 6,892)
Div. 0A south of 72°	86,176 (S.E. 12,501)	Div. 1B-1A south	36,416 (S.E. na)
Div. 0B	68,917 (S.E. 6,522)	Div. 1CD	75,896 (S.E. 5,186)
Total	200,970		166,179
Grand Total			367,149

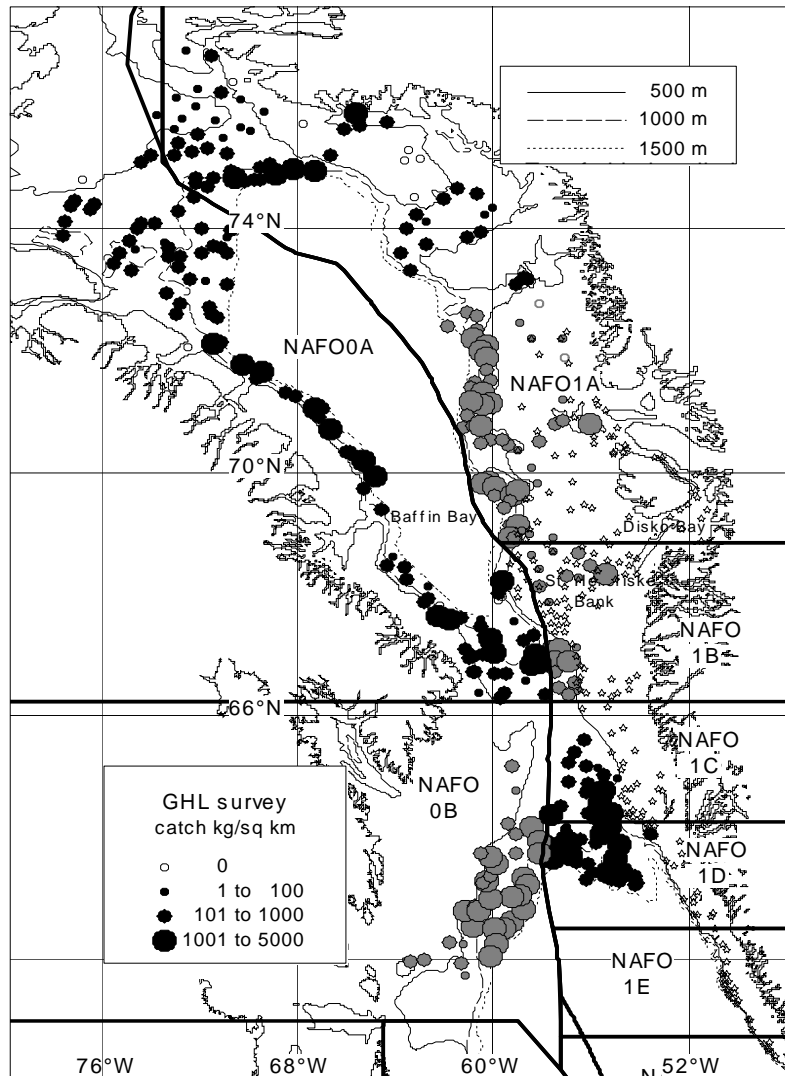


Figure 7. Distribution of catches in deep sea surveys conducted by Canada and Greenland in 2001 (grey) and 2004 (black) (from Anonymous 2005). Further the position of the hauls in the 2004 Greenland shrimp survey are shown as stars (Note: This survey used a different gear and the catches are not directly comparable to the catches in the deep sea survey).

Greenland researchers have conducted surveys in Divisions 1C and 1D each year since 1997, extending the survey into Divisions 1A and 1B in 2001 and 2004.

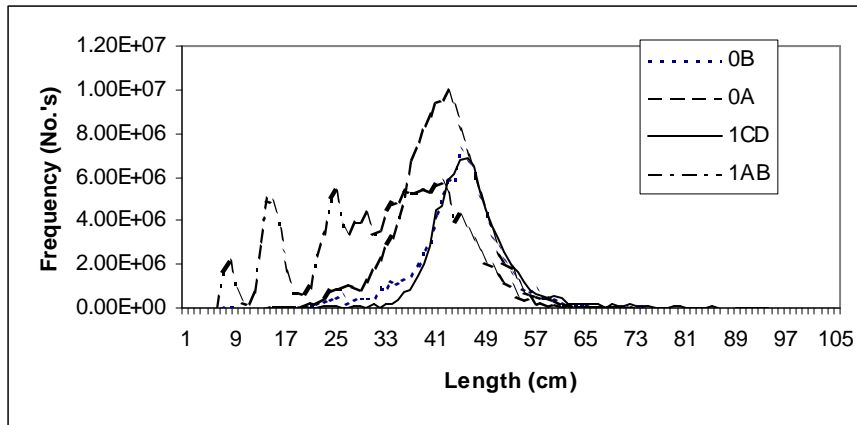


Figure 8. Estimated abundance at length for the Greenland halibut population in NAFO Divisions 0A, 0B, 1AB and 1CD, 2001.

In 2001 the length distributions in Divisions 1CD and 0B were very similar with modes of 45 cm (Figure 8). 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, in 2001, Divisions 0A, and 1A and 1B contained large numbers of small fish (<45 cm) as compared to Divisions 0B and 1C and 1D.

Length frequency data from recent surveys in Division 1CD show similar patterns with a mode at approx. 50 cm (Figure 9).

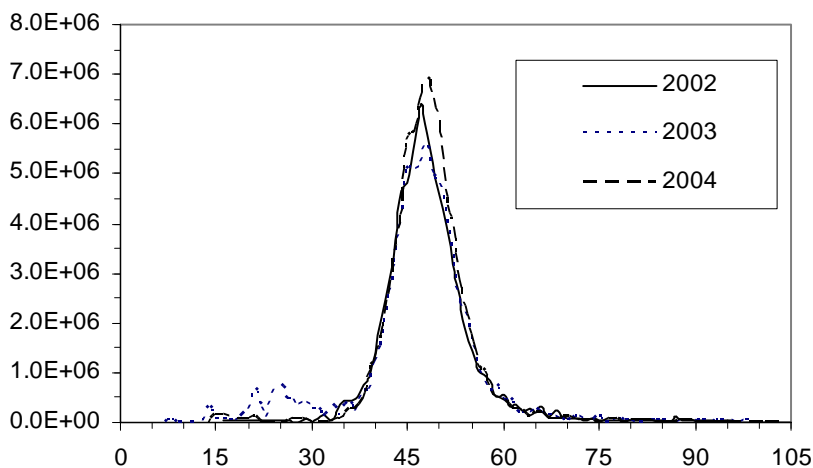


Figure 9. Over all length distribution of Greenland halibut in the Division 1CD survey, depths 600 m to 1500 m for 2002 to 2004 (from Jørgensen 2005b).

Biomass calculated from the survey indices show that the stock has been increasing gradually in recent years and is now estimated to be at the level of the late 1980's and early 1990's (Figure 10).

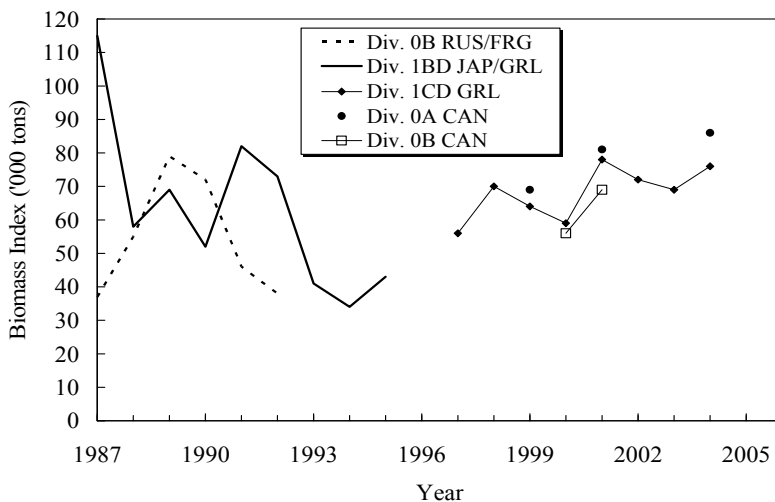


Figure 10. Biomass estimates from surveys conducted in SA 0+1 (excluding Division 1A inshore) from 1987 to 2004 (from Anonymous 2005).

5.3 Scientific Research

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.

DFO Research Plan

A. Surveys

In 2006 and 2008 DFO proposes to survey the southern portion of Division 0A up to 72° N Latitude, from 100 m to 1500 m. Fish and invertebrates on the shallow shelf areas (100 m to 400 m) included in these surveys will be studied for the first time. In 2007 and 2009 it is proposed to survey fish and invertebrates in Hudson Strait and Ungava Bay. Information on both adult and juvenile Greenland halibut will be collected during these surveys.

Ideally, routine monitoring surveys would be established in both Division 0A and 0B. These surveys would be conducted in coordination with Greenland's surveys in Subarea 1 in order to provide fishery-independent information on the status of Greenland halibut for the whole shared stock area of Subarea 0 and Subarea 1A offshore and 1B-F.

B. Other DFO research

Samples collected during the up-coming surveys as well as previous surveys are being used in the following research projects:

1. Greenland halibut reproduction and maturity – conducted by Joanne Morgan and Rick Rideout from DFO with funding from DFO's International Governance Fund.
2. Greenland Halibut genetics study – conducted by Lianne Postma from DFO, with funding from DFO's Nunavut Land Claim Implementation Fund.
3. Greenland halibut food and feeding – conducted by Margaret Treble from DFO, with funding from DFO and NWMB.
4. Greenland halibut ecosystem assessment - conducted by Chandra Chambers, a University of Manitoba graduate student, with funding from DFO and several external sources.

In addition, DFO staff continues to work on age validation and age determination techniques to improve Greenland halibut age estimates.

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 Scientific Council 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. A large harvest (22,000t in 2005) 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 indicates that the Greenland halibut found in these fjords do not contribute to offshore spawning stock, so that this fishery should have 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 in 2005.

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

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).

In order to protect fish stocks 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 0A Greenland halibut fishery from 1996 to 2001, small fish comprised 27 to 50% of the overall catch which was attributed to two separate factors. First, 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 mesh selectivity experiments). Conclusive data on suitable mesh sizes for meeting the small fish protocol are not available. The second factor resulting in high catches of small fish seemed unique to Division 0A where approximately 70% of the fish in the surveyed areas were less than 45 cm, so vessels found it difficult to find areas where they could adhere to the small fish protocol.

More recent data from 2002 to 2004, including the 2004 survey in 0A, showed that the size of fish in 0A has been increasing and in 2004 the size frequency of fish in the 0A survey was similar to what had been seen in the 2001 survey of 0B. The modal and mean lengths of fish from the trawl fisheries in 0A and 0B were similar in 2004 and the percent of fish <45 cm was actually greater in the 0B trawl fishery in 2004 (27%) than it was in 0A (20%).

The strong 1995 year-class may still be present 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 next strongest year classes from 2000 and 2002. This presents a concern because catches of small fish will increase, and it will again become more difficult to adhere to the small fish protocol.

6.4 Non-catch mortality

Narwhal (Laidre et al. 2004) and Greenland shark are known to prey on Greenland halibut and may represent a significant portion of their natural mortality. Also, 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.

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.

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, longlining and gill netting, up to 10 species or families were listed as by-catch in the 2003 to 2005 fishery. Data from 2003 show a total of 197 tonnes of skate, 83 tonnes of shark and 27 tonnes of grenadier to be the most commonly caught. In 2004, 28 tonnes of shark, 16 tonnes of skate and 2 tonnes of grenadier were caught and in 2005, 31 tonnes of skate, 16 tonnes of shark and 3 tonnes of roundnose grenadier were the most commonly caught.

In Division 0B, both mobile and fixed gear are used. Data from 2003 show 29 tonnes of grenadier, 11 tonnes of skate, 10 tonnes of shark, 7 tonnes of catfish (spotted wolffish) to be the most common by-catch species. In 2004, 23 tonnes of grenadier, 11 tonnes of skate, 9 tonnes of shark and 7 tonnes of catfish (spotted wolffish) were the most commonly caught. In 2005, grenadier and shark were the two most common bycatches at 7 and 2 tonnes respectively.

The Northern wolffish and Spotted wolffish have been designated as threatened species under the Species at Risk Act. Greenland halibut licence conditions require the issuing of incidental harm permits; and that measures established by recovery plans be followed. These recovery measures include the mandatory live release of wolffish, or the retention of wolffish for the purpose of scientific study.

6.6 Species and ecosystems of special concern

Roundnose grenadier

This species is in the northern margin of its range in 0B and surveys in Subarea 0 caught Roundnose grenadier only in Division 0B, with biomass estimated in 2001 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 in 2006-2008 (Anonymous 2005).

Wolffish

Wolffish by-catch has increased in the 0A fishery in recent years. In 2005 observers recorded that 6,255 kg of Northern wolffish, 371 kg of Spotted wolffish and 28 kg of Striped wolffish were discarded. There is limited observer coverage in the 0B fishery but logbook data indicated that 7t of catfish (wolffish species) were caught in 0B in 2004.

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 mandatory live release of wolffish, or the retention of wolffish for the purpose of scientific study.

Narwhal

DFO Science Central and Arctic Region established fishing licence restrictions for the Greenland halibut fishery in the southeastern portion of Division 0A in 1998 to protect narwhal habitat and forage species in a significant portion of the southern narwhal over-wintering area (Laidre et al. 2003). The deep waters beyond the shelf break in this area have been identified as an important narwhal overwintering area. Narwhal have been observed making repetitive dives to depths of 1000 m or more, likely to feed on Greenland halibut that are abundant at these depths. Similar restrictions have not been placed on the shrimp fishery in this area as that fishery does not occur in the deep waters frequented by narwhal.

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, *Paragorgia arborea*, *Acanella arbuscula*, *Flabellum* spp. (Gass and Willison 2005) and *Keratoisis ornata* (unpublished report) have been identified in the deep waters (>500 m) of the southeastern portion of Subarea 0 that is also used by over-wintering narwhal. Fishing license restrictions were implemented for this area in 1998 that help protect these corals. Corals found in other areas may also require conservation measures.

Ecosystems of concern

The area identified as narwhal over-wintering habitat also includes several locations at depths greater than 500 m where cold water corals have been identified suggesting this could be an ecologically or biologically sensitive area (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 Subarea 0. 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), however, analysis of data specific to SA0 has not been completed.

Different gear types also have different habitat impacts. Current information available on the impacts of trawling on ocean-bottom habitat were reviewed by DFO Science in March 2006. The specific advice resulting from the peer review meeting is documented in the Science Advisory Report (2006/025) produced by the Canadian Science Advisory Secretariat (CSAS). The information issued from this meeting represents the science basis on which Canadian policy regarding the management of mobile fishing gears could be based.

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 February 2006:

A. Biological Objectives

1. Improve scientific knowledge of the Greenland halibut (turbot) stock.
2. Maintain a healthy Greenland halibut (turbot) stock through the use of science, Inuit knowledge the precautionary approach and discussions with other resource users.
3. Minimize harvest of small fish.
4. Operate consistently with the Species at Risk legislation.
5. Protect critical habitat, ecosystems and other species.
6. Collect and document Inuit knowledge of Greenland halibut (turbot).

B. Socio-economic Objectives

1. Develop and maintain a healthy and sustainable fishery.
2. As per the IPAC report, no additional access be granted to non-Nunavut interests in adjacent waters until Nunavut has achieved access to a major share of its adjacent fishery.
3. Adopt the principles and criteria from the IPAC report for decision making in fisheries allocations.
4. Maximize economic benefits for Nunavut from its adjacent fisheries.

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 6. Subarea 0 Greenland halibut management measures.

Management Issue	Management measures under this management plan
<u>Conservation Concerns</u>	<ul style="list-style-type: none">• A conservation harvest plan specific to each division within Subarea 0 has been established.
Small fish and size of catches	<ul style="list-style-type: none">• Conservative TAC in 0A• Measures to minimize the harvest of small fish < 45cm.• Encourage use of long line vessels in 0A.• Further research on mesh selectivity.• Further research on aging techniques size at sexual maturity and frequency of spawning.• Gear restrictions (see details below).
Uncertainty in stock biomass estimates	<ul style="list-style-type: none">• Conservative TAC in 0A• Ongoing science surveys.
Spawning stock	<ul style="list-style-type: none">• Onboard observers for all vessels operating January to April inclusive (outside traditional fishing season).• All onboard observers will look for evidence of spawning.
<u>Species of conservation interest</u>	
Wolffish (by-catch) <ul style="list-style-type: none">• Northern wolffish (<i>Anarhichas denticulatus</i>)• Spotted wolffish (<i>Anarhichas minor</i>)	<ul style="list-style-type: none">• 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 fishing commercially must return these species to the water 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 outlines these reporting requirements.• Observers required to record the number of wolffish encounters per trip.
Narwhal overwintering	<ul style="list-style-type: none">• No Greenland halibut fishing in the Narwhal overwintering

grounds and deep sea corals	<p>and hard coral area.</p> <ul style="list-style-type: none"> The restricted zone is contained in an area outlined by lines connecting the following points: <ul style="list-style-type: none"> ➤ Point A) 68° 15"N / 58° 33" 4.7W in the North east ➤ Point B) 68° 15"N / 60° 30"W in the north west ➤ Point C) 67° 15"N / 60° 30"W in the south west ➤ Point D) 67° 15"N / 57° 50" 33W in the south east. <p>Points A and D are connected by the NAFO Division boundary.</p>
Bowhead	<ul style="list-style-type: none"> Onboard observers required to report all cetacean sightings.
Roundnose grenadier	<ul style="list-style-type: none"> No special measures required.
Atlantic halibut	<ul style="list-style-type: none"> Release of all Atlantic halibut < 81cm (32")
Other by-catch	<ul style="list-style-type: none"> 10% maximum per trip by-catch of non directed species for all vessels.
<u>Enforcement Measures</u>	
Dockside Monitors	<ul style="list-style-type: none"> 100% dockside monitoring is required. In Nunavut, industry funded onboard observers act as dockside monitors. Outside Nunavut, industry funds 100% dockside monitoring of all catches. When offloading in Greenland ports, and onboard observers are not present, industry funds the services of Lloyds of London agents who conduct dockside monitoring.
Observer coverage	<ul style="list-style-type: none"> 100% observer coverage in 0A 100% observer coverage January to April inclusive for all vessels in 0B. 100% observer coverage for mobile gear in 0B. 20% observer coverage on fixed gear in 0B. Observer sea day costs funded by industry. Vessels must notify Observer Company six hours prior to sailing.
Hails	<ul style="list-style-type: none"> Daily hails of position, activity and catches must be sent to licensing office for all vessels.
Logbooks	<ul style="list-style-type: none"> Accurate fishing and production logbooks are required to be submitted to the appropriate area office for all vessels.

Additional enforcement	<ul style="list-style-type: none"> • Air surveillance conducted regularly. • Satellite transponders are required onboard and operational on all vessels.
<u>Other management issues</u>	
Seismic work	<ul style="list-style-type: none"> • DFO will notify the fishing industry of proposed seismic work in SA0.
Gear restrictions	<ul style="list-style-type: none"> • Minimum gillnet mesh sizes of 153mm (6.0”) for water depths less than 730m (400 fathoms) and 190mm (7.5”) in depths greater than 730m (400 fathoms). • A maximum of 500 nets of 91m (50 fathoms) each. • Gill net vessels must be out of 0A by Nov 10 of the fishing year. This is a standing agreement with DFO and the NWMB but may be reconsidered depending ice conditions at the time. • Longlines are restricted to hooks that have a gape opening of 15.4mm (hook size of #14 circle) • Otter trawl minimum of 145mm diamond or 155mm square mesh.
Gear conflicts in 0B	<ul style="list-style-type: none"> • 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 10N; and long line vessels are restricted to the same area or in water depths greater than 1372m (750 fathoms).

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 license fees before commercial licenses 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.

Since 1999 DFO has partnered with the Nunavut Wildlife Management Board and other groups including the Government of Nunavut and Baffin Fisheries Coalition to fund scientific research 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.

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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 hauls, 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

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 and 0B 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
- Provides advice and other support as mutually agreed on research projects required for proper stock assessments

Maritimes Regional Headquarters (Dartmouth)

Resource Management

- Issues licenses for Maritimes quota allocations
- 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.

Backgrounders

0a And 1AB Greenland Halibut (Turbot)

March 2006

What is the 2006 TAC?

The Northwest Atlantic Fisheries Organization (NAFO) Scientific Council recommended that the total allowable catch (TAC) of turbot in NAFO divisions 0A and 1AB not exceed 13,000 tonnes (t) in 2006. This will mean an increase of 5,000 t from 2005 when the TAC was established at 8,000t.

The Canadian quota for Division 0A (adjacent to Nunavut) will be established at a minimum of 6,500t pending further discussions with Greenland on the sharing arrangements. This is an increase of 2,500t for Canadian interests from 2005.

How will it be shared?

Nunavut will receive the entire increase of the 2006 Canadian quota. With today's announcement, Nunavut's share of turbot represents 68%. This is in line with the department's priority of providing Nunavut the major share of this resource over time.

DFO gives special consideration to Nunavut interests when issuing commercial fishing licences and allocations for fisheries adjacent to Nunavut as part of the Nunavut Land Claims Agreement. The department remains committed to providing Nunavut interests with the major share of adjacent fisheries resources to the territory over time, while also considering the interests of the historic participants in these fisheries.

DFO held consultations with industry, provinces, and Aboriginal groups in November 2005 on the proposed increase and how this increase would be allocated.

What is next?

The 2006 access and allocation arrangements in 0A will be stabilized for four years.

Should stock levels increase in the 0B fishery, existing access arrangements remain in effect but shares will have to be reviewed in light of land claims.

Annex III: Iqaluit Turbot Review and Recommendations

Agenda

Sub –Area 0 Turbot Management Plan Review Meeting

Iqaluit, NU

February 7 - 8, 2006, 8:30 am

Navigator Inn, Salon A & B

1. Opening of Meeting:

- A. Introduction by Chair
- B. Review of Agenda
- C. Opening remarks

2. Overview of Subarea 0 Fishery:

- A. History
- B. Current Management Plan
 - i. Fishery Objectives
 - Biological
 - Socio-economic
 - ii. Management Measures
- C. Fishery Developments since 2003
 - i. Expansion in 0A
 - ii. Cumberland Sound Zone
 - iii. Other inshore fisheries
 - iv. Landings

3. Science:

- A. Ecosystem/habitat description
- B. Results of recent research
 - i. Surveys in Subareas 0 + 1
 - ii. Cumberland Sound
 - iii. Fisheries Monitoring (Observer Data)
- C. Current & Future science initiatives

4. Inuit Qaujimajatuqangit (Traditional Knowledge):

- A. Relation to turbot management issues

5. International:

- A. Report on bilateral discussions with Greenland

6. Objectives for Management Plan for 2006 and beyond

- A. Biological
- B. Socio-economic

7. Management Measures

- A. Gear types and conflicts
 - i. Trawling
 - ii. Gill nets
 - iii. Long-lining
- B. Fishing Restrictions in Narwhal Over Wintering and Hard Coral Areas
- C. By-catch / Species at Risk
- D. Small fish protocol
 - i. 0A and 0B small fish harvest
 - ii. Options
- E. Observer coverage, enforcement
- F. Other
 - i. Spawning closures
 - ii. Regulatory Changes

8. Next Steps

2006 Meeting Participants

NAME	GROUP	NAME	GROUP
Samie Josephee	Amarok HTA (Iq)	Ken Fowler	Labrador Shrimp Co.
David Middleton	Barry Group Inc.	Adamie Alaku	Makivik Corporation PQ
Karl Sullivan	Barry Group Inc.	Neil Greig	Makivik Corporation PQ
Jerry Ward	BFC	Johnny Peters	Makivik Corporation PQ
Ben Kovic	BFC	Nick Illauq	Mammaqtulirijiit Fisheries (Clyde)
Johnny Mike	BFC	Maliktoo Lyta	Mayukalik HTA (Kim)
David Alexander	BFC	Billy Palluq	Minicipality of Clyde river
Brian Burke	Burke Consulting/ (w Wayne)	Brian Shebib	MV Osprey
Joopa Sowdluapik	C. Sound Fisheries	James Qilliq	Namautaq HTA (Clyde)
Roger Alivaktuk	C. Sound Fisheries	Manasie Audlakiak	Namautaq HTA (Clyde)
Peter Matthews	Clearwater	Koalie Kooneelise	Nattivak HTO (Qik)

Christine Penney	Clearwater	Samuel Nuqingaq	Nattivak HTO (Qik)
John Andrews	Davis Strait Management Ltd.	Brian McNamara	Newfound Resources
Lance Dawe	Davis Strait Management Ltd.	Jeff Simms	Newfound Resources
Grant Stonehouse	Davis Strait Management Ltd.	Jeff Maurice	NTI
Paul Glavine	Dept. of Fisheries & Aquaculture	Genn Williams	NTI
Michelle Wheatley	DFO - Iqaluit	Stanley Oliver	Nunatsiavut Gov. (Lab In Ass)
Stefan Romberg	DFO - Iqaluit	Jim Noble	NWMB
Keith Pelley	DFO - Iqaluit	Joe Tigullaraq	NWMB
Sandra Courchesne	DFO - Iqaluit	Joe Justus	NWMB
Andrejka Lokar	DFO - Iqaluit	Michael P. Nowlinski	Pang Fisheries
Joanne rose	DFO - Iqaluit	Jacopie Maniapik	Pang Fishery
Andrew Molloy	DFO - Iqaluit	Jooeelee Papatsie	Pang HTO
Gary Brocklehurst	DFO - NFLD/Lab	Adamie	Pangnirtung ?
Dawn Pearcey	DFO - Ottawa	Peter Keenainak	Qikiqtaaluk Corp
Sam Stephenson	DFO - Wng	Brian Mcleod	Qikiqtaaluk Corp
Margaret Treble	DFO - Wpg	Robin Quinlan	Quinlan Brothers LTD.
Wayne Lynch	DOE, GN	Sytukie Joamie	Quliruaq Inc.
Esberg Kjolbro	Farocan Inc.	Gideonie Joamie	Quliruaq Inc.
Rex Simmonds	Fixed gear Inshore Harvesters	Rick Selleck	Senate of Canada
Clarence Cabot	Funk Island Banker	Senator Adams	Senate of Canada
Beverly Sheppard	Harbour Grace Shrimp Co. Ltd.	Harry Earle	Terra Nova Trading
Leesee Papatsie	Jencor Fisheries LTD.	Keith Watts	Torngat Fish Producers Coop. Sc
Russel Chislett	Kabva Marine LTD	Greg Flower	Torngat Fish Producers Coop. Sc
Rob Coombs	Katsheshuk/Ueushuk fisheries	Trevor Decker	Trinav Consultants
Phil Quinlan	labrador Shrimp Co.	BrooksPilgram	Trinav Consultants

Annex IV: Review of the NAFO Subarea 0 Greenland Halibut Fishery

Management Plan

Terms of Reference

Purpose

The purpose of the industry consultation is to review the Subarea 0 Greenland halibut fishery management plan that has been in place since 2003 and to provide the Department of Fisheries and Oceans with advice on any changes to the current plan for the future management and development of this fishery.

Scope

The review will provide for consultation with various parties with interest in the Subarea 0 Greenland halibut fishery. Invitees to the consultation include federal and provincial governments, fishers and processors.

The review will provide an opportunity for discussion on the existing management plan and issues that have arisen during the last three years. Discussions may include, but are not restricted to, advice on: regulatory amendments; enforcement efforts; seasons; size limits; gear restrictions; administration of company allocations and other developmental activities but will not include any discussions on access and allocation.

Recommendations from this meeting will be provided to the Minister of Fisheries and Oceans for decisions on changes to the management measures for the future multi-year management plan for the Subarea 0 Greenland halibut fishery.

Chairperson

The review will be chaired by the Area Director, Eastern Arctic Area Office, Fisheries & Oceans Canada.

Attendance

The Department will not reimburse expenses for attendance at the review meeting.

Those who cannot attend may provide a written submission to the Chair in advance of the meeting so that they can be provided to other parties for consideration at the meeting.

Administration

No formal voting procedures will be implemented, but rather the review will seek to provide recommendations based on consensus.

Summary results of the review will be prepared and distributed by DFO.