

Ad Hoc Review Group

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Implementation Plan

Denmark (in respect of the Faroe Islands and Greenland)

- Greenland



Aalisarnermut, Piniarnermut Nunalerinermullu Naalakkersuisoq
Department of Fisheries, Hunting and Agriculture

Ilisimatitsissut Notat

Uunga NASCO
Til

Assinga uunga
Kopi til

Implementation Plan

1. Introduction

Quota-based fishing for first-hand sales companies is not used in Greenland although it's a possibility. Since 2002 the annual quota for salmon has been 0 tons. Therefore there has not been carried out any commercial fishing for sale to processing plants. In addition, there is a ban on the export of salmon. Sport and leisure fisheries are thus still allowed for the inhabitants of Greenland, as are fisheries with the intent for sale in open air markets, to hotels and public institutions.

A characteristic feature of salmon fisheries in Greenland is that there is no specific Greenlandic salmon population, which means that fishing activities are based on a population composed of salmon primarily from North America (about 75%) and to some extent from Europe (about 25%).

Fishing activities in Greenland thus differ from fishing activities in the other member states because no management targets can be set for the protection of indigenous populations in rivers and other waters. Initiatives in Greenland will therefore focus on salmon fisheries.

Salmon fisheries can be broken down into:

- subsistence fisheries for sale in open air markets or to hotels, institutions, etc.
- subsistence fisheries for personal consumption

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- sport and leisure fisheries

Subsistence fisheries are considered to be the main area of fisheries. No specific quota has been fixed for subsistence fisheries, as this type of fishery is characterised by being carried out to cover immediate needs for food and may thus vary from year to year, dependent of the households' ability to provide food from other hunting and fishing activities.

Although there is no specific quota, the regulation agreement of the West Greenland Commission (WGC) of NASCO mentions that food requirements are estimated to the amount of about 20 tons.

The objectives of Greenland's management of salmon are:

- To provide satisfactory data on fisheries, broken down on individual licences
- To provide data on annual catches for subsistence fisheries for private consumption and sale locally in Greenland.

Reports received with regard to licences issued, catches per licence, the geographical distribution of catches, and fishing gear reported per licence present measurable indicators of the salmon fisheries in Greenland.

In accordance with the recommendations of ICES, management in Greenland will endeavour to enhance the reporting made by fishermen in the form of requirements of more accurate and detailed information provided in the reporting forms that all fishermen must send to the Greenland Fishing Licence Control Authority. Such improved reporting could be achieved through information and through control of catches.

1.1. Objectives of the national management strategy

The Greenlandic Home rule policy is to facilitate exploitation of the resource on a sustainable basis. This goal is to be achieved through the strategic objective of ensuring that the salmon stock will only be exploited as subsistence and recreational fishing.

In April 1985, following the withdrawal of Greenland from the European Union Denmark in respect of Greenland acceded to the NASCO Convention with the effect that Denmark in respect of Greenland became a Party to the Convention. Therefore the Greenlandic Home rule shares the objective expressed in article 3 in NASCO Convention of contributing to the conservation, restoration, enhancement and rational management of salmon stocks in the North Atlantic Ocean.

Further NASCO has adopted the precautionary approach. The NASCO Agreement on the Adoption of the Precautionary approach states that stocks should be maintained above the conservation limits by the use of management targets.

The Agreement on Adoption of the Precautionary approach also states that socio-economic factors could be taken into account in applying the precautionary Approach to fisheries management issues.

1.2 Nature and extent of resource

The commercial Atlantic salmon fishery off the coast of West Greenland began in the early 1960s. The distribution of the fishery ranged from Upernavik in the North to Nanortalik in the South (NAFO divisions 1A to 1F). Catches increased substantially concurrent with increasing fishing efforts to a high of 2,689 tons

reported in 1971. Since the 1980s catches have decreased considerably and now make up a small but significant fishery that has been less or about 20 tons in recent years (table 1).

Estimates of the abundance of salmon before exploitation are made for the North American (NA) and Southern European (SE) MSW stock complexes, which make up the majority of the West Greenland mixed stock complex. This is called a Pre-fishery Abundance (PFA). The pre-fishery abundance PFA_{NA} for 2007 and 2008 is 114.000 and 120.000 fish, respectively. The southern European PFA_{SE} forecast for 2007 and 2008 is 461.000 and 440.000 fish, respectively.

1.3 Overview of fisheries

The number of fishermen who are active in salmon fisheries has declined from more than 500 to less than 150 over the past six years. Of the 75 people who reported catches in 2005, only a total of 29 had a license to subsistence fishery . Since 2000, the number of active fishermen has been between 41 and 76, increasing slightly in the last two years. The decline in the number of fisherman with licenses has followed the decline of allowable catches through the years from more than 1000 tons when the fishery was at its height to the recent 14 tons in 2005. Catches are still observed in all NAFO Divisions 1A to 1F, indicating that the salmon resource is still broadly distributed in West Greenland. There have been no reported catches from East Greenland in recent years.

1.4 Management entities and methods of fishery

The paradigm of the Greenland Fisheries Authority is that all fisheries in Greenland waters must be regulated by means of Home Rule executive orders. In this way it is ensured that all technical and administrative decisions are made at an administrative level.

This also applies to salmon fisheries, which are regulated by Home Rule Executive Order No 21 of 10 August 2002 of salmon fisheries. The Home Rule Executive operates with commercial fishery and non-commercial fishery.

Under current legislation, commercial salmon fishery may be carried out either as:

1. Quota fishing for sale to local trading companies. This option has not been used as Greenland, as mentioned above, only has subsistence fisheries.
2. Non-quota fishing for sale exclusively on local open air markets or to hotels, restaurants, hospitals, institutions of education and other public catering facilities.

Commercial salmon fishing require a licence.

Licences are issued by the Department of Fisheries, Hunting and Agriculture to applicants who meet the following requirements:

- They must have a permanent affiliation with Greenland.
- They must own their own salmon nets and a vessel suitable for salmon fishing of length that does not exceed 12.8 metres (42 feet).
- They must, together with the application, submit information on the number and type of salmon nets they have.

Only hooks or nets with a stretched mesh size of at least 140 mm are allowed in commercial salmon fishing. Drift nets may be used, but no more than 20 lengths at a time.

Non-commercial fishing may be carried out from vessels of up to 12.8 metres (42 feet). Hooks and rods for salmon fishing and one (1) 2000 knot stationary net with a mesh size of at least 140 mm (stretch width) may be used.

As mentioned above, the possibility of quota-based fishing for first-hand sales companies is not used in Greenland. Since 2002 the annual quota for salmon has been 0 tons meaning there is not carried out any commercial fishing for salmon for sale to processing plants. In addition, a ban on the export of salmon was introduced. Sport and leisure fisheries are thus still allowed for the inhabitants of Greenland, as are fisheries with the intent for sale in open air markets, to hotels and public institutions.

Each year the Department of Fisheries, Hunting and Agriculture fixes a start and end date for non-quota salmon fisheries. After the expiry of the period, all types of commercial fishing for salmon is prohibited, and so is all selling and buying of catches from such fishing activities.

All salmon catches, both from commercial and non-commercial fishing activities, must be reported to the Greenland Fishing Licence Control Authority (GFLK).

2. Status of Stocks

The salmon in the stock complex in the West Greenland fishery are mostly (>90%) non-maturing 1SW salmon, most of which are destined to return to home waters in North America or Europe as Multiple Sea Winter (2SW or 3SW) fish.

The reference points for West Greenland catch options are therefore the spawner reserves for the North American and Southern European stock complex. These numbers are based on region specific conservation limits derived in 3 ways. The conservation limits are calculated as

- (1) the number of spawners required to fully seed the wetted area of the river or
- (2) pseudo stock-recruitment observations used to calculate a hockey stick relationship, with the inflection point defining the conservation limits or
- (3) as the number of spawners that will achieve long-term average maximum sustainable yield (MSY), as derived from the adult-to-adult stock and recruitment relationship. The conservation limits are limit reference points (Slim), which should be avoided with high probability.

Conservation limits for North America are limited to 2SW salmon and Southern European stocks are limited to MSW salmon (2SW and 3SW). The 2SW spawner limits of salmon stocks from North America total 152.548 fish, with 123.349 required in Canadian rivers and 29.199 in USA rivers. The current conservation limit estimate for Southern European MSW stocks is approximately 275.000 fish with however a considerable uncertainty.

The stocks making up the stock complex at West Greenland with the exception of Newfoundland are all considered to be below the S_{lim} and thus suffering reduced

reproductive capacity. The stock complex at Newfoundland is at risk of suffering reduced reproductive capacity.

More specifically 2 SW spawners in the individual regions are:

Newfoundland: at risk of reduced reproductive capacity (132% of 2SW Slim)

Labrador: suffering reduced reproductive capacity (38% of 2SW Slim)

Québec: suffering reduced reproductive capacity (70% of 2SW Slim)

Gulf of St. Lawrence: suffering reduced reproductive capacity (86% of 2SW Slim)

Scotia-Fundy: suffering reduced reproductive capacity (6% of 2SW Slim) with Inner Bay of Fundy stocks listed as Endangered by the Committee on the Status of Endangered Wildlife in Canada.

United States: suffering reduced reproductive capacity (4% of 2SW Slim) with stocks in the Gulf of Maine District Population Segment listed as Endangered under the Endangered Species Act.

Southern European stock complex: suffering reduced reproductive capacity (94% of 2SW Slim)

Recent trends in the stocks making up the stock complex in West Greenland show the MSW stocks in North America have declined to among the lowest levels observed historically. The primary MSW European stocks originating from the southern stock complex has been declining steadily since the 1970s.

2.1 Abundance

Greenland does not have its own home-water stock (with the exception of the river Kapisillit in Godthåb Fjord of which no abundance estimates exist) and so it is the mixed stock made up of both North American and European stocks that contributes to this fishery. The total pre-fishery abundance (PFA) of salmon from these stocks for 2006 are 608.000 fish. Projections for 2007 and 2008 for the North American stocks show the PFA_{NA} forecasts remain among the lowest in the time series. For 2007 and 2008, the median value is 114.000 and 120.000 fish, respectively and it is highly unlikely to meet the 2SW spawner reserve. The PFA for NEAC MSW southern stock complex is expected to decline in 2007 and 2008. For 2007, the median value is 461.000 fish and for 2008, the median forecast value is 440.000 fish. Thus, it is unlikely that spawner reserves will be met in either year.

Other data regarding home-water stock characteristics from the Greenlandic mixed stocks which primarily include, Newfoundland, Labrador, Québec, Gulf of St Lawrence, Scotia-Fundy and United States as the North American stocks and England, Wales, Northern Ireland, Scotland, Ireland and France as the southern European stocks are found in their respective national reports including their respective implementation plans.

2.2 Diversity

An ongoing international sampling programme has been sampling salmon to obtain biological data from this fishery and its associated stocks since 1969. These data show >70% of the salmon have North American origin and approximately 30% are determined to be of European origin. Data has also shown that the proportion of individuals originating from North America is higher the further north along the western Greenlandic coast the fish are caught. In general, there has been a

gradual increase in the proportion of North American individuals over the past 5 years.

There was an overall decrease in mean whole weight (kg) of both European and North American sampled 1SW salmon from 1969–1995. This trend was reversed in 1996, when mean weights began to increase, although there was a sharp drop in 2000, primarily for the North American component. In 2005, the mean North American 1SW salmon was 659 mm and 3.19 kg whole weight and the mean European 1SW salmon was 664 mm and 3.33 kg. These data continue the trend started in 1996 of increasing fish size contributing to the fishery as represented by the sampled catch.

2.3 Threatened or endangered stocks

The mixed stocks in the Greenland fisheries include the North American stocks from the Inner Bay of Fundy in Canada and stocks in the Gulf of Maine District Population Segment, which are both listed as Endangered by the Committee on the Status of Endangered Wildlife in Canada and under the Endangered Species Act.

3. Threats to stocks, and current management measures

The current exploitation rates on the mixed stocks in Greenland has declined from values prior to 1993 averaging 26% to around 5% for the North American salmon and less than 1% for the southern European stock. However, because the stocks making up the stock complex at West Greenland are all considered to be below the *Slim* and thus at risk or are suffering reduced reproductive capacity i.e. the number of returning spawners is poor, their status would be increasingly threatened by any major increase in exploitation.

Current management measures regulating the exploitation of salmon are a quota system, which is not used at present, and subsistence fishery, which only allows sale to local markets, hotels, restaurants, hospitals, educational centres and other public eating places. Fishing authorities have also introduced seasonal fishery, which typically runs for three months from August to October and does not allow any form of fishery outside of this period.

3.1 Effects of salmon fisheries and fisheries taking juvenile or adult salmon as a bycatch

There is no specific knowledge of exploitation of salmon as by-catch in other fisheries of Greenland and it is therefore unlikely that significant numbers of salmon are caught outside the fishery that targets salmon.

3.2 Factors affecting estuarine and freshwater salmon habitat

The mixed stocks found at West Greenland are sea-run salmon that have other countries of origin and are therefore less associated and not dependent on estuarine or freshwater habitats in the rivers in Greenland for spawning or nursery areas.

3.3 Impacts of aquaculture, introductions and transfers and transgenics (including diseases and parasites);

There is no marine salmon aquaculture facilities in Greenland and therefore there are no environmentally threatening factors associated with this form of production

originating from Greenland that could be detrimental to the stocks at West Greenland.

The international sampling programme checks salmon for fish diseases, in particular the virus ISAv, of which all samples as of now have been negative.

3.4 Other influences affecting salmon abundance or diversity (including marine environment).

The marine environment in West Greenland is considered pristine and is therefore not considered to have negative effects on salmon stocks for anthropogenic causes.

4. Management approach

4.1. Management of fisheries

The most important problem relating to salmon fisheries in Greenland is to provide reliable data on this type of fisheries. The licence system is believed to be a good basis for management. However, the Department of Fisheries, Hunting and Agriculture recognises that there is a discrepancy between the number of licences issued and the licences in relation to which catches are reported. The reason for this may be that applications for licences are not based on a desire to carry out fisheries for salmon actively but rather on a wish to avoid losing the right to a licence in the subsequent year, as it is a requirement in the management of other fisheries in Greenland (Greenlandic Halibut, Snow crabs etc.) that to obtain a licence for a specific year, the applicant must have had a licence in the preceding year. This may possibly be the philosophy behind many of the licence applications that are filed. Another explanation could be that the licence applicants are unaware of the reporting requirement. The Greenland Home Rule Authority has therefore initiated an information campaign in 2006 and 2007 to make licence holders and people fishing for salmon for non-commercial use aware of the fact that all catches must be reported. The effect on and development as regards the number of reports on salmon catches received as compared with the number of licences issued will thus be essential instruments in the assessment of the extent of salmon fisheries in Greenland. A spin-off effect may be a better basis for assessing non-reported catches, but it is still too early to draw any conclusions in that respect.

4.1.1. Future actions to be taken

The Greenlandic fishery is limited to subsistence fisheries, which is estimated to be around 20 tonnes a year. Because of the limited outtake, the primary management objective is to ensure there is no commercial exploitation of salmon, except from the small-scale sales in open markets mentioned above. This is done by ensuring that all commercial fisheries are licensed and the received catch reports provide a reliable picture of the real outtake in the salmon fishery.

The main future objective of Greenland's management of salmon is to provide satisfactory data on salmon fisheries. Therefore the output of this plan is to provide reports on the development in the:

- Number of licenses issued
- Catches per license
- The geographical distribution of catches
- Fishing gear reported per license

Concrete future actions to be taken to achieve satisfactory data on salmon fishery is:

- Annual information campaigns during the fishing period
- Salmon fishing becomes a part of the “Piniarneq” in 2008. “Piniarneq” is the booklet informing the Greenlandic population about hunting rules and hunting and fishing seasons..

Expected outputs

The diagram mentioned below illustrates the development in receipt of catch reports in the salmon fisheries:

Year	Catch reports	Licences	Used licences	Percentage of used licences
2005	144	185	29	16.0 %
2006	234	165	51	30.9 %
2007	226	261	105	40.2 %

There is no clear indication of when a reliable picture of the salmon fisheries is achieved but it is thought to be when the percentage of used licenses is about 50 %. Because the main objective is about changing people’s behaviour, as regards to reporting salmon catches, it cannot be expected to achieve 50 % within a year or two. Therefore, it is thought reasonable to take a five-year approach to achieve the mentioned output at 50 %.

4.2. Protect and restore salmon habitat

All salmon in the mixed stock at West Greenland originate from home waters outside of Greenland.

4.2.1. International sampling effort

Greenland contributes to the international sampling effort relating to the management of the offshore fishery.

In 2007, the sampling programme included sampling teams from Greenland, United States, United Kingdom and Ireland. Teams were in place a week after the opening of the fishery and continued working until 31 October. Specimens were sampled for presence of tags, fork length, weight, scales, and tissue samples for DNA analysis. Samples were obtained from four landing sites, in Qaqortoq (NAFO Division 1F), Nuuk (1D), Maniitsoq (1C) and Ilulissat (1B). The sampled salmon were measured, scales were removed for ageing, gutted weight recorded. The number of scale samples that were collected and aged and the total number of tissue samples that were removed and preserved for DNA analysis by North American collaborators are known yet.

4.3. Manage aquaculture, introductions and transfers

Aquaculture is almost non-existent in Greenland, the only project being an experimental project in South Greenland focusing on common mussels.

4.4 Actions to be taken in relation to other influences

At present there are no other actions to improve at sea survival other than the restrictions imposed on the fishery.

5.0 Evaluation

Greenland is atypical compared with the other NASCO member states, primarily because Greenland has only one mixed stock. Consequently many of the conventional initiatives for improvement and assessment of stocks cannot be used in Greenland.

In addition, fisheries in Greenland are subsistence fisheries. No true commercial fishing for salmon exists any longer. Consequently the primary management assignment in Greenland is to ensure that fisheries are estimated as accurately as possible. In this connection Greenland initiated a comprehensive information campaign in 2006 and 2007 to ensure that all salmon catches will be reported to the Greenland Fisheries Control Authority. Thus the measurable indicator for the management is the number of catches reported as compared with the number of licences issued.

Salmon fisheries in Greenland can only be characterised as insignificant from a global perspective. Issues relating to aquaculture are non-existent in Greenland. Consequently the primary objective must be to ensure that the data concerning fisheries are updated and reliable.

Table 1. Distribution of nominal catches (tons) of Atlantic salmon in Greenland by Greenlandic vessels 1977-2006.

Year	NAFO Division						NK	West	East	Total
	1A	1B	1C	1D	1E	1F		Greenland	Greenland	
1977	201	393	336	207	237	46	-	1420	6	1426
1978	81	349	245	186	113	10	-	984	8	992
1979	120	343	524	213	164	31	-	1395	+	1395
1980	52	275	404	231	158	74	-	1194	+	1194
1981	105	403	348	203	153	32	20	1264	+	1264
1982	111	330	239	136	167	76	18	1077	+	1077
1983	14	77	93	41	55	30	-	310	+	310
1984	33	116	64	4	43	32	5	297	+	297
1985	85	124	198	207	147	103	-	864	7	871
1986	46	73	128	203	233	277	-	960	19	979
1987	48	114	229	205	261	109	-	966	+	966
1988	24	100	213	191	198	167	-	893	4	897
1989	9	28	81	73	75	71	-	337	-	337
1990	4	20	132	54	16	48	-	274	-	274
1991	12	36	120	38	108	158	-	472	4	476
1992	-	4	23	5	75	130	-	237	5	242
1993	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-
1995	0	10	28	17	22	5	-	83	2	85
1996	0	0	50	8	23	10	-	92	0	92
1997	1	5	15	4	16	17	-	58	1	59
1998	1	2	2	4	1	2	-	11	0	11
1999	0	2	3	9	2	2	-	19	0	19
2000	0	0	1	7	0	13	-	21	0	21
2001	0	1	4	5	3	28	-	43	0	43
2002	0	0	2	4	1	2	-	9	0	9
2003	1	0	2	1	1	5	-	9	0	9
2004	3	1	4	2	3	2	-	15	0	15
2005	1	3	2	1	3	4	-	14	0	14
2006	5	2	3	4	2	4	-	20	0	20