



SCIENTIFIC COUNCIL MEETING – JUNE 2003

Assessment of Other Finfish in NAFO Subarea 1

by

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Abstract

The NAFO Scientific Council was requested to provide advice for 2004 and 2005 on management for any stock of finfish in Subarea 1 of commercial interest, for which data allow a status report. Under this item, available survey data for the stocks of American plaice, Atlantic and Spotted wolffish and Thorny skate were analysed, which contributed major parts to the demersal fish assemblage off West Greenland. Despite gradually increasing recruitment since the 1980s, no increase in Atlantic wolffish SSB has been observed. The recent increase in recruitment of American plaice has not yet resulted in any increase in SSB. Both spotted wolffish and thorny skates have exhibited declines since the 1980s and the biomass indices have remained at very low levels since beginning of the 1990ies. Based on the above STACFIS has concluded that the status of these stocks remains severely depleted. Taking the poor stock status of American plaice, Atlantic wolffish, spotted wolffish and thorny skate into account, even low amounts of fish taken and discarded by the shrimp fishery might be sufficient to retard the recovery potential of these stocks. The continued failure of the recruits to rebuild the spawning stocks indicates high mortality rates in excess of the sustainable level. The probability of stock recovery would be enhanced by minimising the by-catch of finfish in SA1 to the lowest possible level.

1. Introduction

The NAFO Scientific Council was requested to provide advice on the scientific basis for management in 2004 and 2005 for any stock of finfish in Subarea 1 of commercial interest, for which data allow a status report. Under this item, available survey data for the stocks of American plaice, Atlantic and spotted wolffish and thorny skate were analysed which contributed major parts to the demersal fish assemblage off West Greenland.

2. Description of the Fisheries

Historically, catches of Greenland cod (*Gadus ogac*), American plaice (*Hippoglossoides platessoides*), Atlantic wolffish (*Anarhichas lupus*), spotted wolffish (*A. minor*), thorny skate (*Raja radiata*), lumpsucker, Atlantic halibut (*Hippoglossus hippoglossus*) and sharks are mainly taken by offshore trawl fisheries directed to shrimp, cod, redfish and Greenland halibut. From 1 Oct 2000, sorting grids are obligatory for the shrimp fisheries and will

hopefully reduce the amount of by-catches of young finfish. Fisheries have also been prosecuted by longliners operating both inshore and offshore and by pound net and gillnet fisheries in inshore areas only.

3. Catches

For the period 1993-2002, catches were listed in Table 1. The values were adopted from the Denmark/Greenland research report (Siegstad and Frandsen, 2003). Estimated catches of other finfish in 2002 amounted to 7 437 tons, representing an increase of about 2 400 tons compared to the 2001 catch. This was mainly caused by an increase in catch of lumpfish by 56%, amounting to 5 800 tons in 2002. Catches of wolffish increased by 63% from 2001 to 2002, amounting to 118 tons in 2002. Atlantic halibut catches decrease from 45 tons in 1999 to only 1 tons in 2001 and 2002.

The catch figures do not include the weight of fish discarded by the trawl fisheries directed to shrimp.

4. Assessment

Due to a lack of adequate commercial data no analytical assessment could be formulated. Therefore, the assessment was based on survey indices.

4.1. Input Data

4.1.1. Commercial fishery data

No data on CPUE, length and age composition of the catches were available. Length frequencies derived from the Greenland shrimp survey revealed that the shrimp trawl was capable of catching all predominant fish sizes (Stor-Poulsen and Jørgensen, 2003). No quantitative information on the amount of juvenile redfish in the by-catches of the shrimp fishery was available for 2003.

4.1.2. Survey data

EU-German groundfish survey. Annual abundance and biomass indices were derived from stratified-random bottom trawl surveys commencing in 1982 (Rätz and Stransky 2003). These surveys covered the areas from the 3-mile limit to the 400 m isobath of Div. 1B to 1F, and were primarily designed for cod as target species. Biomass estimates for American plaice, Atlantic wolffish, spotted wolffish and thorny skate remained severely depleted after severe declines until 1991. Recently, some stocks showed increased recruitment, which did not, yet resulted in a significant increase in the mature biomass (Fig. 1-5).

Greenland-Japan and Greenland groundfish surveys. During 1987-95, cooperative trawl surveys directed to Greenland halibut and roundnose grenadier have been conducted on the continental slope in Div. 1A-1D at depths between 400 and 1 500 m. This Greenland-Japan deep-water survey was discontinued in 1996. From 1997, a Greenland survey was initiated with another vessel and changed gear (Jørgensen, 2003). In 1999, estimates of biomass indices for American plaice were very low and amounted to 135 tons (Fig. 1). Very few American plaice has been recorded in the survey since 1999. Therefore, no biomass estimated is available from this survey.

Greenland groundfish/shrimp survey. Since 1988, a shrimp survey was conducted by Greenland covering the Div. 1A to 1F down to 600 m depth (Stor-Poulsen and Jørgensen, 2003). Due to changes in survey strategy and sampling of fish, determinations of abundance and biomass indices and length composition were considered comparable since 1992. Abundance and biomass indices of American plaice, Atlantic wolffish, spotted wolffish and thorny skate were very low (Fig. 1). All stocks mentioned were dominated by juveniles as derived from length measurements.

4.2. State of the stocks

American plaice SSB was derived from German length disaggregated abundance indices to which a length-maturity ogive was applied (Lloret, 1997). During 1982-91, the SSB decreased drastically to depletion without a significant increase since then (Fig. 2). Recruitment is presented as abundance of small fish 15-20 cm representing age group 5 and indicates an increase to the average level in 1997 and 1998. In 1999 the recruitment decreased

again and have since been at a very low level. Indications for reduced probability of recruitment at low SSB can be derived from the recruitment-SSB plot (Fig. 3).

The estimation of Atlantic wolffish SSB and recruitment was performed in the same manner as for American plaice, i.e. using a length-maturity ogive and fish of 15-20 cm representing 3 year old recruits (Möller and Rätz, 1998). Since 1982, the SSB decreased drastically and remains severely depleted since the early 1990's (Fig. 4). In contrast, until 1994 recruitment increased almost continuously. Recruitment was at a very low level in 1995, increased again in the late 1990's, although it varied considerably. Recruitment in 2001 and 2002 decrease again to the 1995-1996 levels. However, the abundant recruits did not contribute significantly to the SSB (Fig. 5).

Biomass indices for spotted wolffish derived from the German groundfish survey and the Greenland shrimp/groundfish survey, show a weak increase since 2000. The German groundfish survey biomass indices for thorny skate show a decrease since 2000, but data derived from the Greenland shrimp/groundfish survey fluctuated without trend since 1995.

4.3. Assessment results

Despite gradually increasing recruitment since the 1980s, no increase in Atlantic wolffish SSB has been observed. The recent increase in recruitment of American plaice has not yet resulted in any increase in SSB. Both spotted wolffish and thorny skates have exhibited declines since the 1980s and the biomass indices remained at very low levels in 2002. Based on the above STACFIS has concluded that the status of these stocks remains severely depleted. Taking the poor stock status of American plaice, Atlantic wolffish, spotted wolffish and thorny skate into account, even low amounts of fish taken and discarded by the shrimp fishery might be sufficient to retard the recovery potential of these stocks. The continued failure of the recruits to rebuild the spawning stocks indicates high mortality rates in excess of the sustainable level. The probability of stock recovery would be enhanced by minimising the by-catch of finfish in SA1 to the lowest possible level. The application of obligatory sorting grids since 1 Oct 2000 will hopefully help to reduce these by-catches.

4.4. Reference points

Due to a lack of appropriate data, STACFIS was unable to propose any limit or buffer reference points for fishing mortality or spawning stock biomass for American plaice, Atlantic wolffish, spotted wolffish, and thorny skate in Subarea 1. Nevertheless, the recently depleted spawning stocks as derived from survey results are considered far below appropriate levels of B_{lim} .

References

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Table 1. Official annual nominal catches of other finfish in Subarea 1 (Siegstad, 2003).

Nominal reported catches (tons) are as follows:

Species	1993	1994	1995	1996	1997	1998	1999	2000	2001 ¹	2002 ¹
Greenland cod	1 896	1 854	2 526	2 117	1 729	1 717	1899	931	1152	939
Wolffishes	157	100	51	47	68	30	33	59	75	118
Atlantic halibut	43	38	23	34	22	22	45	9	1	1
Lumpsucker	246	607	447	425	1 158	2 143	3058	1211	3216	5795
Sharks	10	34	46	135	nd	nd	nd	nd	nd	nd
Non-specified finfish	411	643	618	609	1 269	588	nd	769	589	584
Sum	2 763	3 276	3 711	3 367	4 246	4 500	5035	2979	5033	7437

¹Estimated

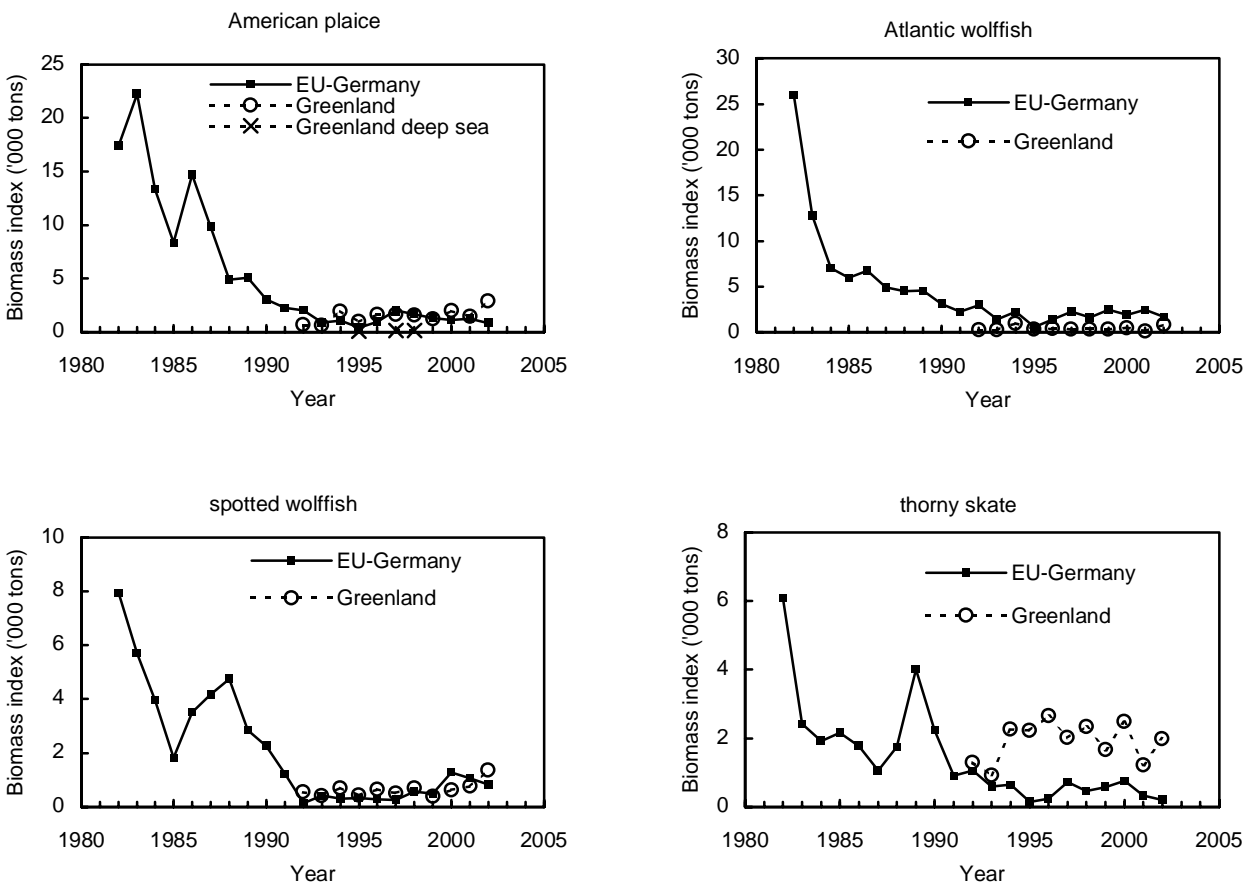


Fig. 1. Finfish in Subarea 1: Estimates of biomass indices from German groundfish surveys and the Greenland shrimp/groundfish survey for American plaice, spotted and Atlantic wolffish and thorny skate.

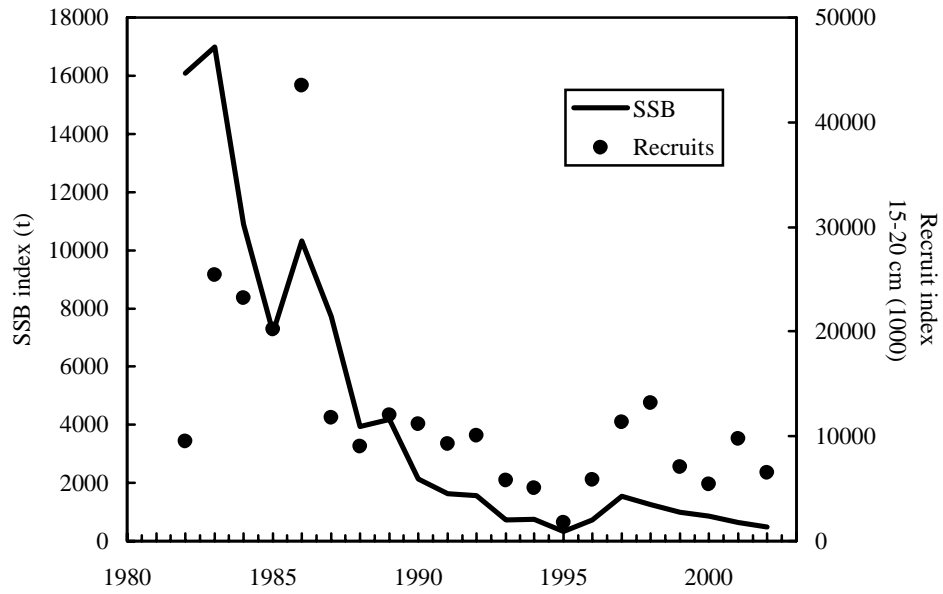


Fig. 2. American plaice Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.

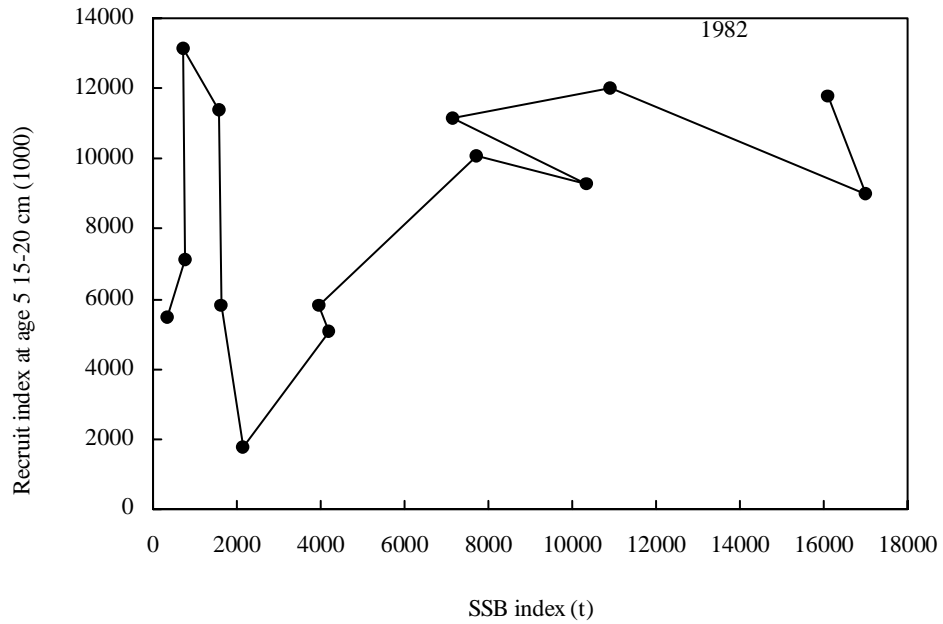


Fig. 3. American plaice Subarea 1. SSB-recruitment plot.

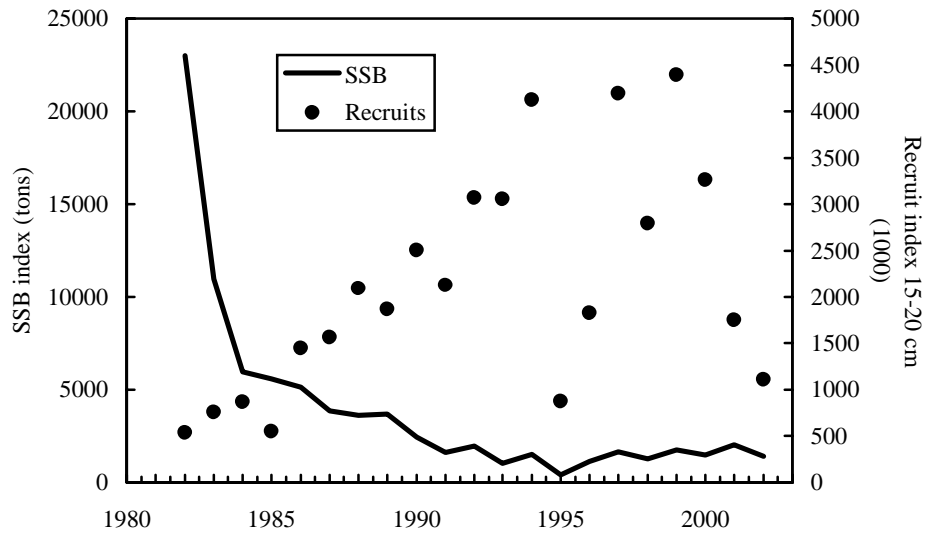


Fig. 4. Atlantic wolffish Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.

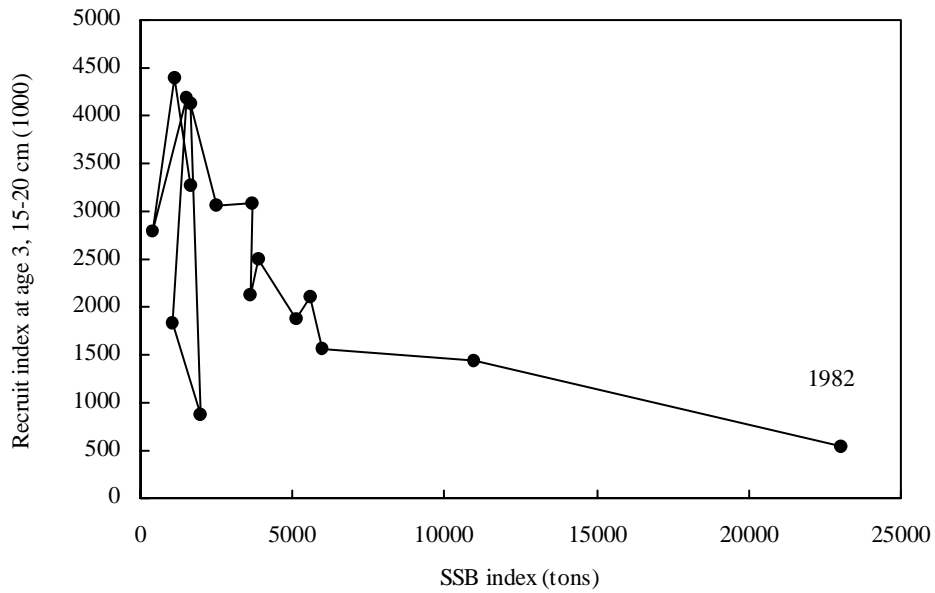


Fig. 5. Atlantic wolffish Subarea 1. SSB-recruitment plot.