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Stock Status Update for Other Finfish in NAFO Subarea 1

by

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1. Introduction

The NAFO Scientific Council was requested to provide advice 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.

2. Description of the Fisheries

Historically, catches of Greenland cod (*Gadus ogac*), American plaice (*Hippoglossoides platessoides*), Atlantic wolffish (*Anarhichas lupus*), spotted wolffish (*A. minor*), starry or thorny skate (*Raja radiata*), lumpsucker (*Cyclopterus lumpus*), Atlantic halibut (*Hippoglossus hippoglossus*) and sharks are mainly taken by offshore trawl fisheries directed to shrimp, cod, redfish and Greenland halibut. 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 1993-2000, catches are listed in Table 1. The values were adopted from the Denmark/Greenland research report (Siegstad, 2001). For 2000, catch reports of other finfish are incomplete and amounted to around 3 000 tons. The catch of lumpsuckers has recently increased to around 3 000 tons from the low level of few hundred tons observed until 1996. Greenland cod and lumpsucker dominated most recent catches of other finfish.

The catch figures do not include the unknown weight of fish discarded by the trawl fisheries directed to shrimp. With the mandatory use of sorting grids to avoid by-catch of fish in the shrimp fishery since October 2000, the unknown by-catch of finfish should be substantially reduced.

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 (Engelstoft and Jørgensen, 2002). There was no updated information on by-catch in the shrimp fishery available.

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. 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 (Rätz *et al*., 2002). Biomass estimates for American plaice, Atlantic wolffish, spotted wolffish, and thorny skate remained severely depleted after severe declines until 1991 (Fig. 1). Recently, some stocks have shown increased recruitment, which did not yet result in a significant increase in the mature biomass, i.e. American plaice, Atlantic wolffish (Fig. 2 and 3).

Greenland-Japan and Greenland deep-sea 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 deep-water survey was discontinued in 1996 but conducted again since 1997 by Greenland with another vessel and changed gear (Jørgensen, 2002). However, 1997 and 1998 estimates of biomass indices for American plaice were very low and amounted to 137 and 136 tons, respectively (Fig. 1).

Greenland bottom trawl survey using a shrimp gear. Since 1988, a shrimp survey was conducted by Greenland covering the Div. 1A to 1F down to 600 m depth (Engelstoft and Jørgensen, 2002). 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, and spotted wolffish were very low without a trend (Fig. 1). Thorny skates were mainly distributed in northern strata with big areas causing higher abundance and biomass estimates. Juveniles as derived from length measurements dominated the stocks mentioned.

4.2. Estimation of parameters

American plaice SSB was derived from German length disaggregated abundance indices to which a length-maturity ogive was applied (Rätz and Lloret, 1999). 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 is indicated to have increased to the average level since 1997. Indications for reduced probability of recruitment at low SSB can be derived from the recruitment-SSB plot (Fig. 2).

The estimation of Atlantic wolfish 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, 1999). Since 1982, the SSB decreased drastically and remains severely depleted since the early-1990s (Fig. 3). In contrast, recruitment increased almost continuously over the time series but varied considerably since 1995. However, the abundant recruits did not contribute significantly to the SSB (Fig. 3).

4.3. Reference points

Due to a lack of appropriate data, proposals of 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 are impossible. Nevertheless, the recently depleted spawning stocks as derived from survey results are considered far below appropriate levels of B_{lim}.

4.4. Management considerations

Despite gradually increasing recruitment since the 1990s no increase in Atlantic wolffish SSB has been observed. The average 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 2001. 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 indicate high mortality rates in excess of the sustainable level. The probability of stock recovery would be enhanced by minimizing the by-catch of finfish in SA1 to the lowest possible level. With the mandatory use of sorting grids to avoid by-catch of fish in the shrimp fishery since October 2000, the unknown by-catch of finfish should be substantially reduced.

There should be no directed fishery for American plaice, Atlantic and spotted wolfish and thorny skate in Subarea 1 and by-catches in other fisheries should be reduced to the minimum level possible.

References

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Table 1. Official annual nominal catches of other finfish in Subarea 1 (Siegstad, 2001).

Nominal reported catches (tons) are as follows:

Species	1993	1994	1995	1996	1997	1998	1999[1]	2000[1]
Greenland cod	1 896	1 854	2 526	2 117	1 729	1 717	1 899	
Wolffishes	157	100	51	47	68	30	26	37
Atlantic halibut	43	38	23	34	22	22	1	9
Lumpsucker	246	607	447	425	1 158	2 143	3 057	3 000
Sharks	10	34	46	135				
Non-specified finfish	411	643	618	609	1 269	588		
Sum	2 763	3 276	3 711	3 367	4 246	4 500	4 983	3 046

[1] Provisional.

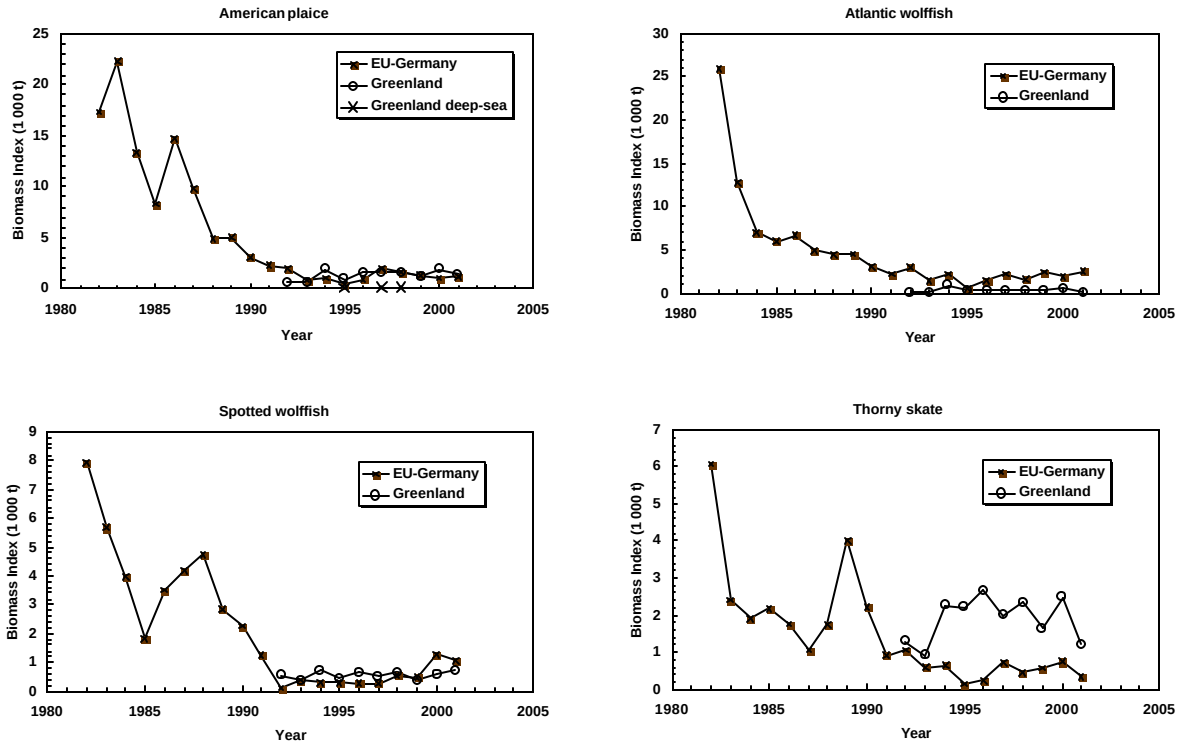

Fig. 1. Finfish in Subarea 1: Estimates of biomass indices from German groundfish surveys and the Greenland shrimp/groundfish survey for American plaice, spotted and Atlantic wolffish and thorny skate.

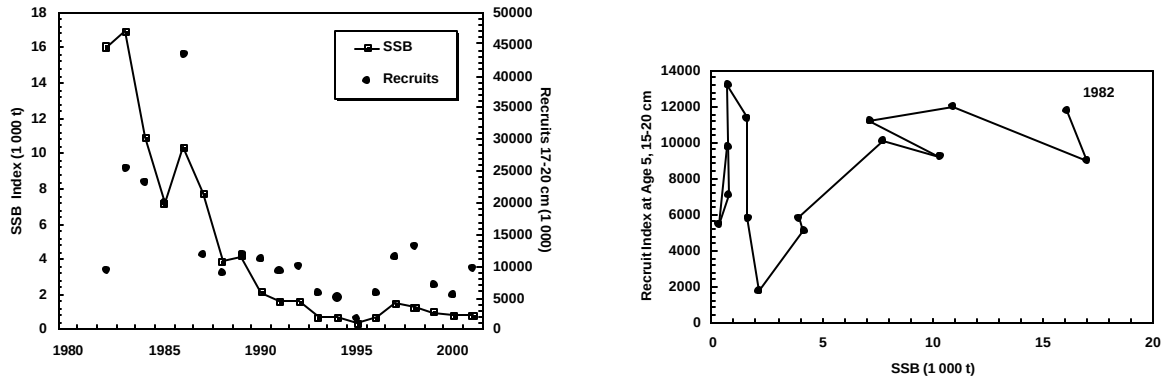

Fig. 2. American plaice Subarea 1: SSB and recruitment indices as derived from the German groundfish survey.

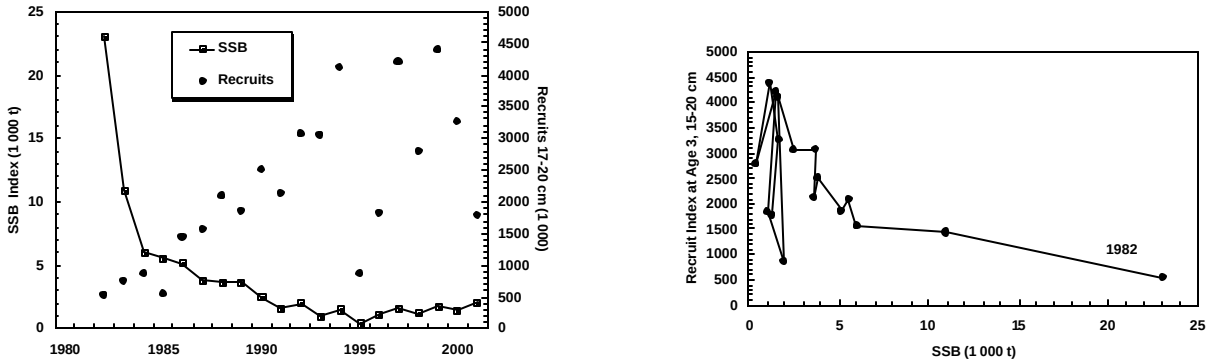

Fig. 3. Atlantic wolffish Subarea 1: SSB and recruitment indices as derived from the German groundfish survey.