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Assessment of 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 starry or 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, 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 1993-97, catches were listed in Table 1. The values were adopted from the Denmark/Greenland research report (Simonsen, 1998). In 1997, reported catches of other finfishes amounted to 4 246 tons representing an increase by 26 %, compared to the 1996 catch (3 367 tons). This is due to increased catch figures for lumpsucker and non specified finfish. Most recent catches of other finfishes were dominated by Greenland cod (41 %), lumpsucker (27 %) and the category of non-specified finfish (30 %).

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 (Engelstoft and Jørgensen, 1998). Estimates of discarded by-catches for July- August 1997 did not exceed 50 tons or 1 million individuals of American plaice, Atlantic wolffish, spotted wolffish, and starry or thorny skates, respectively. This is likely due to the recent decline in the species rather than changes in the selectivity of the gear. Given uncertainties related to the estimation methodology and likely seasonal changes, the assessment of annual discard rates is impossible.

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, 1998). 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. After severe declines until 1991 some stocks showed first and very slight indications of stock recovery due to increased recruitment but not yet of significant contributions to the mature biomass, i.e. American plaice, Atlantic wolffish (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 but in 1997 a Greenland survey was initiated with another vessel and changed gear (Jørgensen, 1998). However, 1997 estimates of abundance and biomass indices for American plaice were very low and amounted to 830 000 individuals and 137 tons, respectively (Fig. 1).

Greenland groundfish/shrimp survey. Since 1988, a shrimp survey was conducted by Greenland covering the Div. 1A to 1F down to 600 m depth (Engelstoft and Jørgensen, 1998). 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 (Fig. 1). Starry or thorny skates were mainly distributed in northern strata with big areas causing higher abundance and biomass estimates. The 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 but showed a slight increase in 1997 (Fig. 2). Recruitment is presented as abundance of small fish 15-20 cm representing age group 5 (Lloret, 1997) and is indicated to be below average since 1989. In 1997, a first indication of stock recovery is based on increased recruitment at the level of the longterm average. Despite the average recruitment in 1997 (1992 year class), 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 5 year old recruits (Möller, 1998). Since 1982, the SSB decreased drastically and remained severely depleted since the early 90s (Fig. 4). In contrast, recruitment increased almost continuously over the time series. Apart from 1995 the recruitment estimates are at or above the average level since the early 90s. However, the abundant recruits did not contribute significantly to the SSB yet and there is no recruitment-SSB relation derivable (Fig. 5).

In view of dramatic declines in survey biomass indices since 1982 to very low levels (Fig. 1) and simultaneous decreases in individual fish weight by more than 80 % it was concluded that the stocks of spotted wolffish and starry or thorny skates in Subarea 1 are severely depleted.

Taking the poor stock status of American plaice, Atlantic wolffish, spotted wolffish and starry or thorny skate into account, low amounts of fish taken and discarded presently by the shrimp fishery might be substantial and concern must be expressed about possible reductions in the recovery potential. The probability of stock recovery should increase if pre-recruitment mortality caused by discarding of finfish in the shrimp fishery in Sub-area 1 is reduced to the lowest level possible.

4.3 Limit and target reference points

Due to a lack of appropriate data, STACFIS was unable to propose any limit or target reference points for fishing mortality or spawning stock biomass for American plaice, Atlantic wolffish, spotted wolffish, and starry or thorny skate in Sub-area 1. Nevertheless, the recently depleted spawning stocks as derived from survey results are considered far below proper levels of Blim.

References

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Table 1 Official annual nominal catches of other finfish in Subarea 1 (Simonsen, 1998).

Nominal reported catches (tons) are as follows:

Species	1993	1994	1995	1996	1997
Greenland cod	1 896	1 854	2 526	2 117	1 729
wolffishes	157	100	51	47	68
Atlantic halibut	43	38	23	34	22
lumpsucker	246	607	447	425	1 158
sharks	10	34	46	135	
non-specified finfish	411	643	618	609	1 269
sum	2763	3276	3711	3367	4246

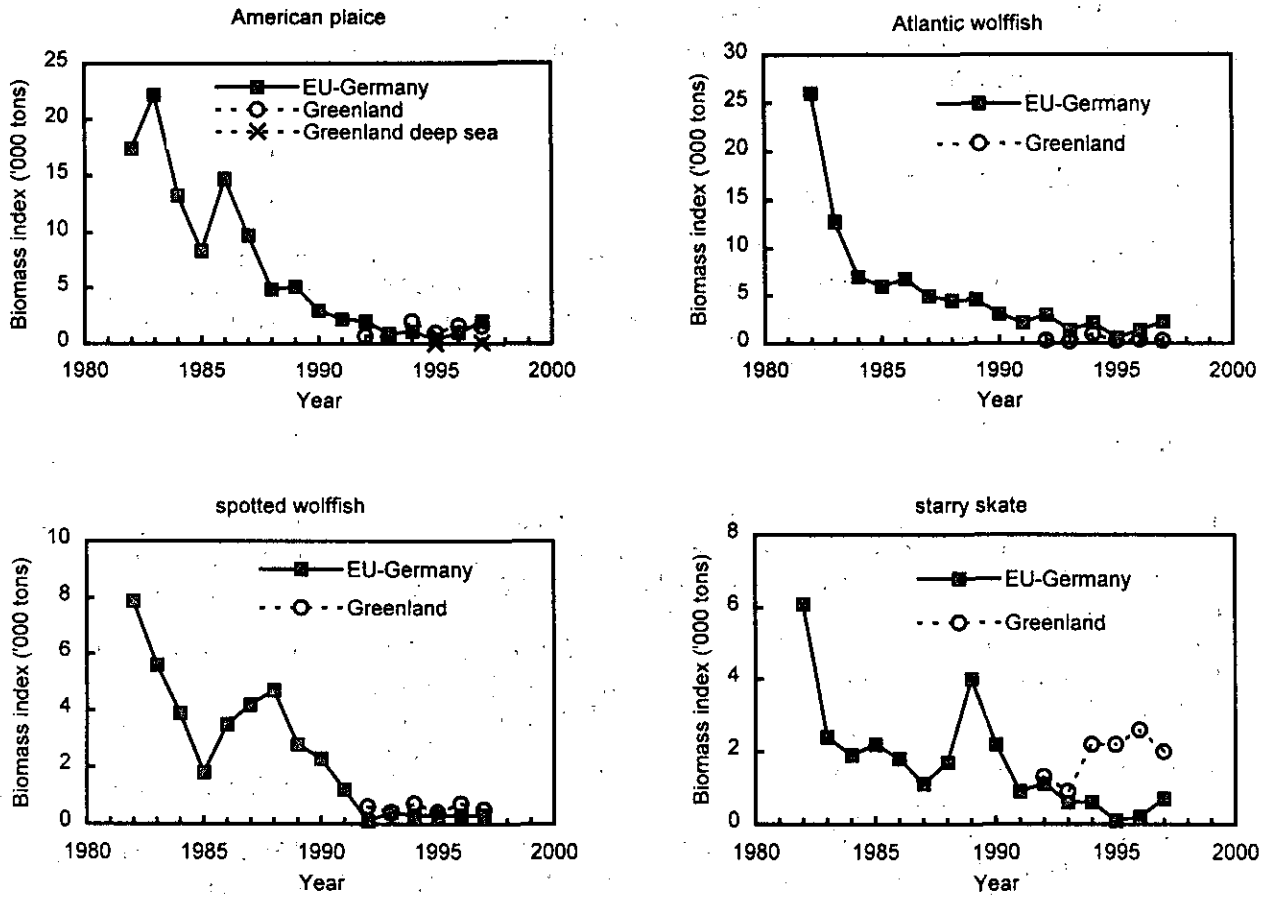


Fig. 1 Finfish in Subarea 1: Estimates of biomass indices from German groundfish suveys and the Greenland shrimp/groundfish survey for American plaice, spotted and Atlantic wolffish and starry or thorny skate.

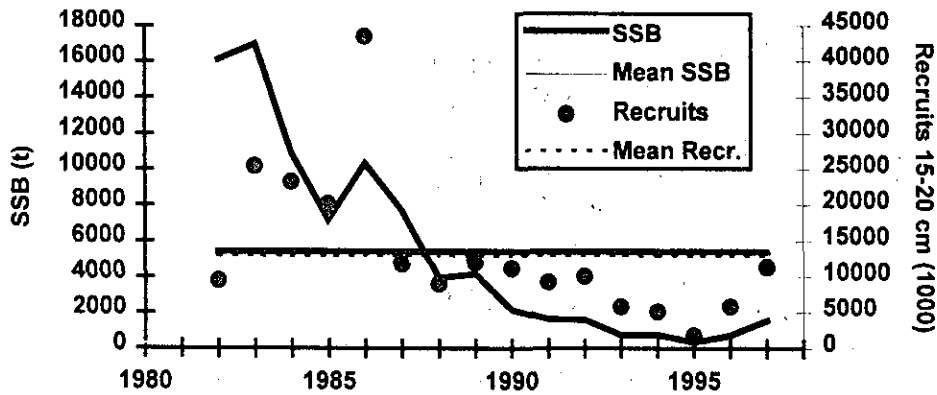


Fig. 2 American plaice Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.

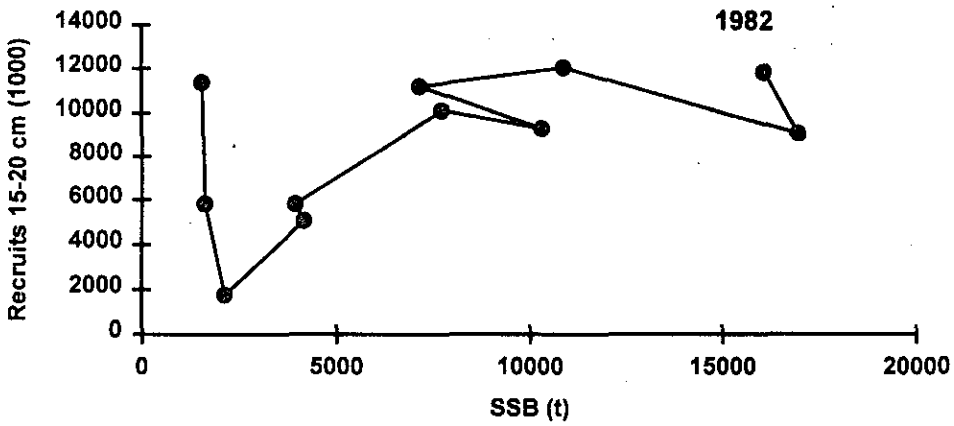


Fig. 3 American plaice Subarea 1. SSB-recruitment plot.

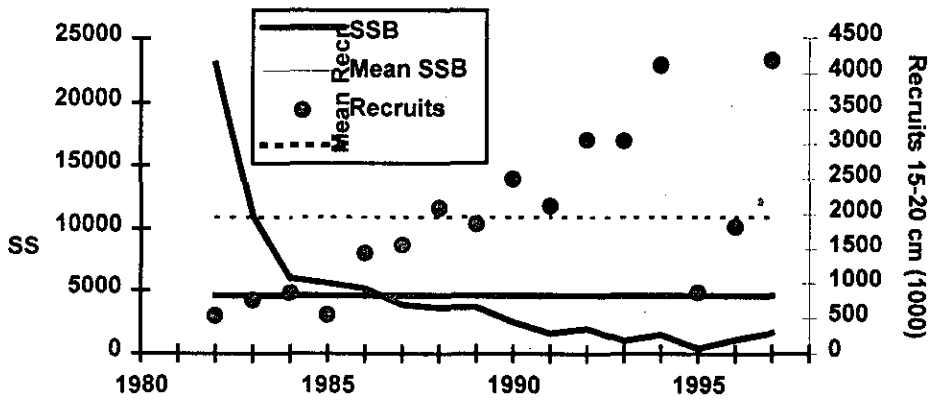


Fig. 4 Atlantic wolffish Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.

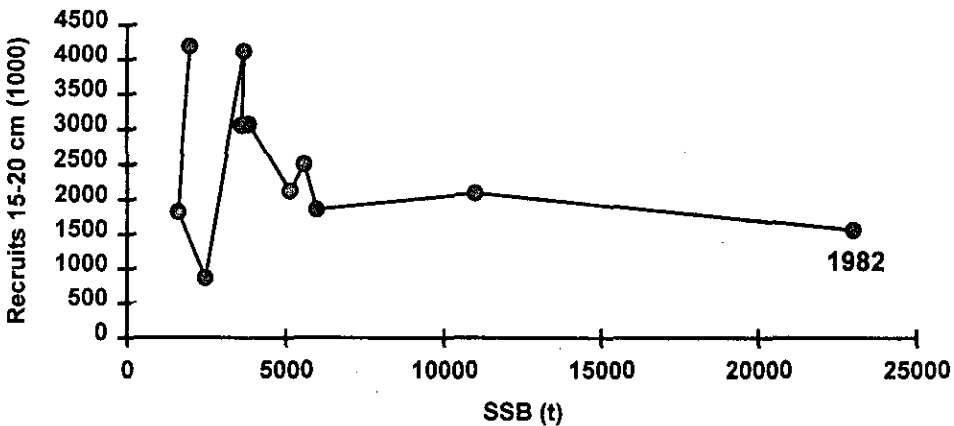


Fig. 5 Atlantic wolffish Subarea 1. SSB-recruitment plot.