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# Stock Status Update 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 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 1993-98, catches are listed in Table 1. The values were adopted from the Denmark/Greenland research report (Siegstad, 2000). For 1999, no nominal catch figures are given. Estimated catches of other finfishes in 1999 amounted to 4.983 tons representing an increase by 10 %, compared to the 1998 catch (4.500 tons). The only significant change was the increase in lumpsucker catches by 43 %. A catch of 3.057 tons of lumpsucker was estimated for 1999. Most recent catches of other finfish were dominated by Greenland cod (38 %) and lumpsucker (61 %).

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

## 4. Assessment

### 4.1. Input Data

#### 4.1.1. Commercial fishery data

No data on CPUE, length and age compositions 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, 2000). There was no information on by-catch in the shrimp fishery available for 2000.

#### 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. Biomass estimates for American plaice, Atlantic wolffish, spotted wolffish, and thorny skate remained severely depleted after severe declines until 1991. 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 Greenland-Japan deep water survey was discontinued in 1996. In 1997 a Greenland survey was initiated with another vessel and changed gear which (Jørgensen, 2000). In 1997 to 1999 the biomass indices for American plaice have been very low and amounted to 137, 136 and 135 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, 2000). 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 has been very low (Fig. 1). All stocks mentioned above were dominated by juveniles as derived from length measurements.

### 4.2. Estimation of parameters

American plaice SSB was derived from German length disaggregated abundance indices to which a length-maturity ogive was applied. 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. Despite the average recruitment since 1997 (1992-1994 year classes), indications for reduced probability of recruitment at low SSB can be derived from the recruitment-SSB plot (Fig. 3).

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. Since 1982, the SSB decreased drastically and remains severely depleted since the early 90s (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. 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 1999. Based on the above STACFIS has concluded that the status of these stocks remain 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.

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 proper levels of Blim.

References

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Table 1 Official annual nominal catches of other finfish in Subarea 1 (Siegstad, 2000).

Nominal reported catches (tons) are as follows:

| Species | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999[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 |
| Atlantic halibut | 43 | 38 | 23 | 34 | 22 | 22 | <1 |
| Lumpsucker | 246 | 607 | 447 | 425 | 1 158 | 2 143 | 3 057 |
| Sharks | 10 | 34 | 46 | 135 | | | |
| Non-specified finfish | 411 | 643 | 618 | 609 | 1 269 | 588 | no data |
| Sum | 2 763 | 3 276 | 3 711 | 3 367 | 4 246 | 4 500 | 4 983 |

[1]Estimated

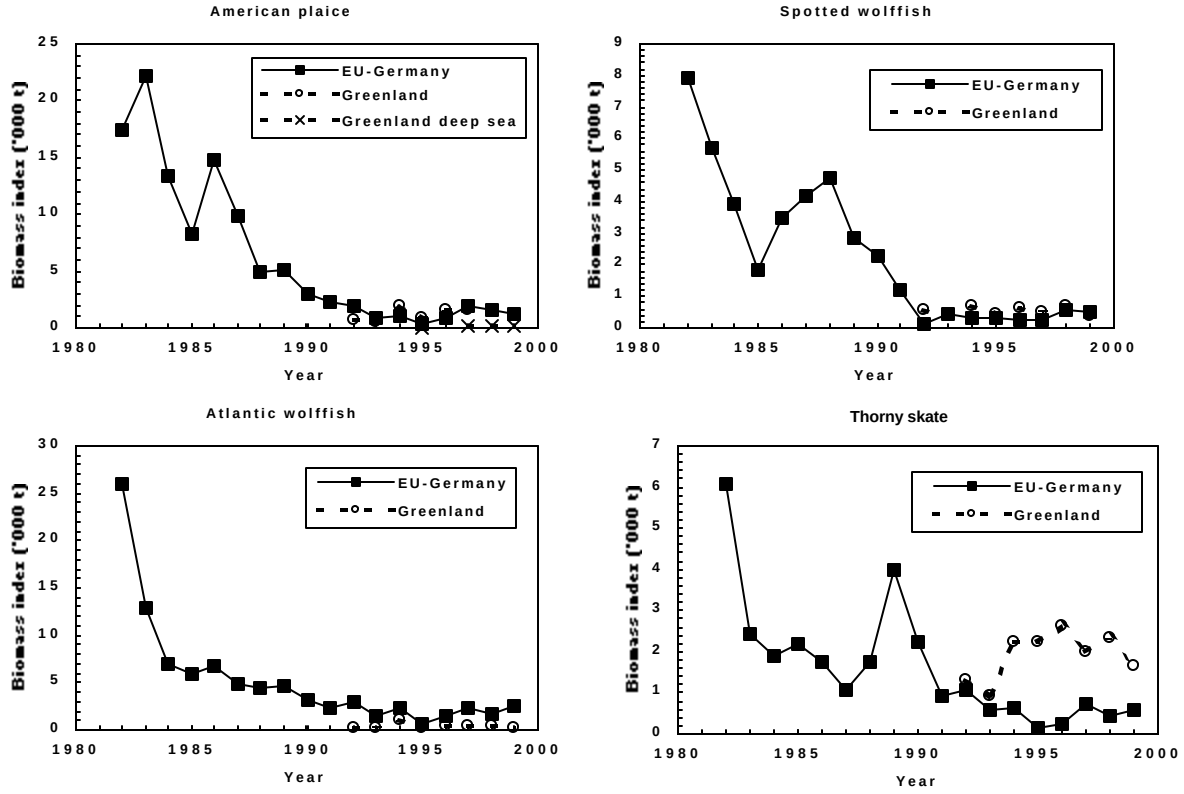


Fig. 1. Finfish in Subarea 1: Estimates of biomass indices from German groundfish surveys and the Greenland shrimp/groundfish survey for American plaice, spotted and Atlantic wolffish and thorny skate.

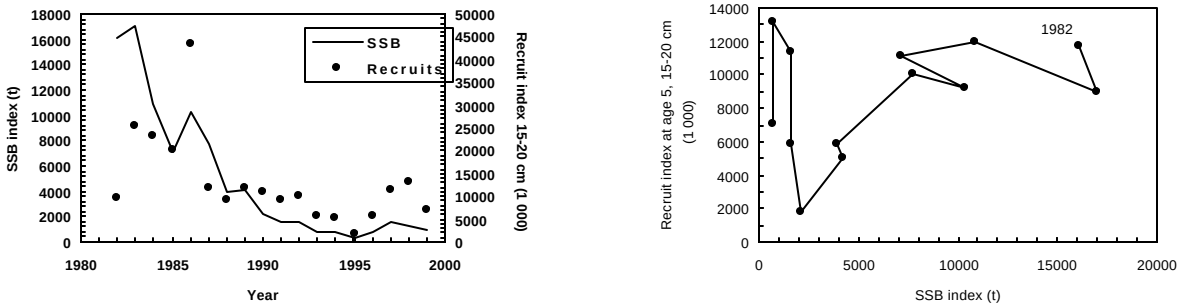


Fig. 2. American plaice Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.

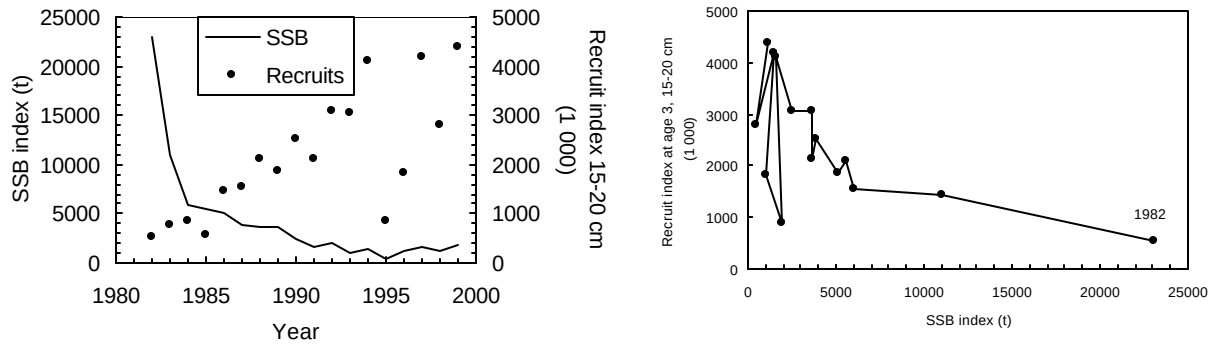


Fig. 3. Atlantic wolffish Subarea 1. SSB and recruitment indices as derived from the German groundfish survey.