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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 skate were analysed which contributed major parts to the demersal fish assemblage off West Greenland.

## 2 Description of the Fisheries

Catches of Greenland cod, American plaice, Atlantic and spotted wolffishes, starry skate, lumpsucker, Atlantic halibut and sharks are taken by offshore trawl fisheries directed to shrimp, cod, redfish and Greenland halibut, by longliners operating both inshore and offshore and by pound net and gillnet fisheries in inshore areas only.

## 3 Catches

For the period 1993-96, catches were listed in Table 1. The values were adopted from the Denmark/Greenland research report (Simonsen, 1997). In 1996, reported catches of other finfishes amounted to 3,367 tons representing a decrease of 9 %, compared to the 1995 catch (3,711 tons). Most recent catches of other finfishes were dominated by Greenland cod (63 %) and the category of non-specified finfish (18 %).

The catch figures do not include the weight of substantial numbers of small 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, 1997).

### 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, 1997). 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. During 1982-96, survey results indicated fundamental shifts in species composition of the demersal fish assemblage inhabiting the shelf and continental slope off West Greenland in Divisions 1B-1F down to 400m depth. These shifts were coincidental with dramatic changes in survey estimates of stock abundance, biomass and size structure for ecologically and economically important species. Recent decreases of biomass estimates for demersal stocks of American plaice, Atlantic and spotted wolffish and starry skates varied between 70 % and almost 100 %, losses in abundance being less pronounced (Fig. 1). Length distributions revealed that recently these stocks were mainly composed of small and juvenile fish. A comparison between the survey results off West and East Greenland indicated that 95 % of the aggregated demersal fish abundance was distributed off East Greenland in 1996. Positive effects in fish abundance, biomass and size for various stocks observed recently were restricted to East Greenland while negative effects were more pronounced off West Greenland.

*Greenland-Japan groundfish survey.* 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 m and 1,500 m (Yokawa et al., 1996). This survey was discontinued in 1996. The estimated biomass of most species classified to other finfishes contributed 16% to the total finfish catch and remained unchanged at lowest level of the time series after a continuous decline up to 1992.

*Greenland shrimp survey.* Since 1988, a shrimp survey was conducted by Greenland covering the Div. 1A to 1F down to 600 m depth. Due to changes in survey strategy and sampling of fish, determinations of abundance and biomass indices and length composition were considered comparable since 1992 (Engelstoft and Jørgensen, 1997). Abundance and biomass indices of American plaice, spotted and Atlantic wolffish were very low. Starry skates were mainly distributed in northern strata with big areas causing higher abundance and biomass estimates. However, mean individual weight varied only between 0,1 and 0,2 kg which is in agreement with the findings of the small fish caught in the German groundfish survey.

## 4.2 State of the stocks

In view of dramatic declines in survey abundance and biomass indices to extremely low levels, together with significant reduction in fish sizes, it was concluded that the demersal stocks of American plaice, Atlantic and spotted wolffish and starry skates in Subarea 1 are severely depleted. The status of the demersal fish assemblage has remained at that low level since 1990 and there are no signs of any recovery. In view of by-catches of juvenile finfish in substantial numbers taken by the shrimp fishery concern must be expressed about the *continuing recruitment failure*.

In order to increase the probability of stock recovery the by-catch of finfish in Subarea 1 taken by the shrimp fishery should be limited to the lowest level possible.

### 4.3 Limit and target reference points

Due to a lack of data, no proposals for appropriate  $F_{lim}$  and  $F_{pa}$  were formulated. Rebuilding strategies should consider both stock biomass and age structure. Given the lack of information, first proposals for  $B_{lim}$  and  $B_{pa}$  were based on the 20 % and 50 % levels of the maximum survey index, respectively. The following text table lists indices of  $B_{lim}$  and  $B_{pa}$  for American plaice, spotted and Atlantic wolffish and starry skates, respectively. As a minimum, the age composition of both stocks should be composed of 50 % mature fish.

Indices of limit and precautionary reference points for biomass as derived from the German groundfish survey for American plaice, spotted wolffish, Atlantic wolffish, and starry skate:

Species	$B_{lim}$ (tons)	$B_{pa}$ (tons)
American plaice	4 500	11 000
spotted wolffish	1 500	4 000
Atlantic wolffish	5 000	13 000
starry skate	1 200	3 000

### References

- Engelstoft, J. J. and O. Jørgensen, 1997. Biomass and Abundance of Demersal Fish Stocks off West Greenland Estimated from the Greenland Trawl Survey, 1988-96. NAFO SCR Doc. 97/39, N2711:1-17
- Rätz, H.-J. 1997. Structures and Changes of the Demersal Fish Assemblage off Greenland and Trends in Near Bottom Temperature, 1982-96. NAFO SCR Doc. 97/5, Ser. No. N2830:1-32
- Simonsen, C. S. 1997. Denmark/Greenland Research Report for 1996. NAFO SCS Doc. 97/11, Ser. No. N2874: 1-6
- Yokawa, K., I. Kouya, and O. Jørgensen, 1996. Results of a stratified-random bottom trawl survey off West Greenland in 1995. NAFO SCR Doc. 96/29, Ser. No. N2702:1-12

Table 1 Official annual nominal catches of other finfish in Subarea 1.

Nominal reported catches (tons) are as follows:

Species	1993	1994	1995	1996
Greenland cod	1,896	1,854	2,526	2,117
wolffishes	157	100	51	47
Atlantic halibut	43	38	23	34
lumpsucker	246	607	447	425
sharks	10	34	46	135
non-specified finfish	411	643	618	609

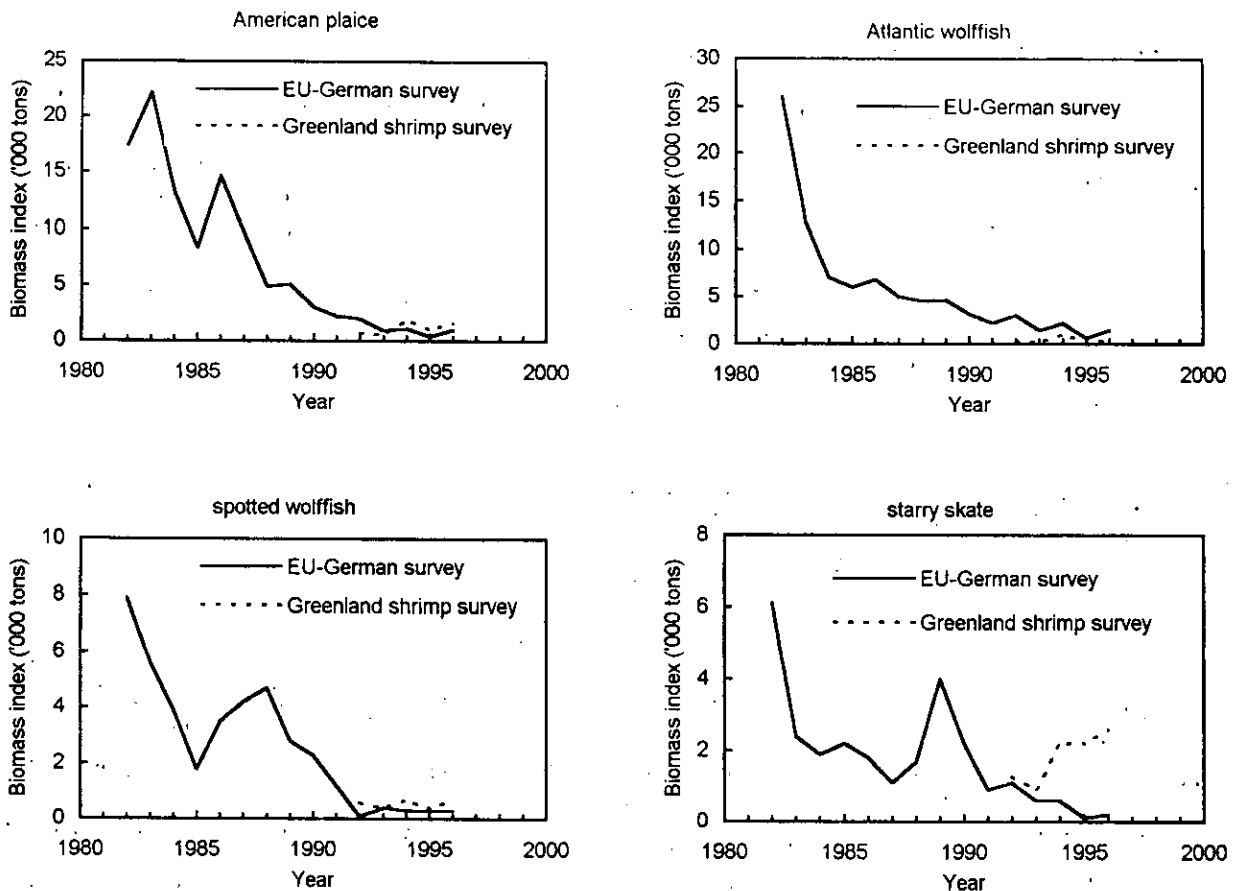


Fig. 1 Finfish in Subarea 1: estimates of biomass indices from German groundfish surveys and the Greenland shrimp survey for American plaice, spotted and Atlantic wolffish and starry skate.