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Assessment of American plaice in NAFO Subarea 1

by

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Abstract

American plaice (*Hippoglossoides platessoides*) is common in all divisions in West Greenland both inshore and offshore from near surface waters to depths of more than 600 meters. In general, American plaice has been of very little commercial interest in Greenland at least for the past three decades. American plaice has mostly been taken as by-catch in other fisheries mostly targeting cod, redfish, Greenland halibut and shrimp. Occasionally, when the cod fishery was poor, vessels would turn to other species such as wolffish and American plaice on the banks off West Greenland. Reported catches of American plaice increased in the same years as wolffish were directly target due to failing cod fisheries in the years after 1974. The highest reported catches occurred in 1977-1979, but in these years non-Greenlandic vessels were excluded from the valuable cod fishery on the banks off West Greenland and massive misreporting were documented.

Introduction

American plaice is common in all divisions in West Greenland both inshore and offshore from near surface waters to more than 600 meters depth. In general, American plaice has been of very little commercial interest in Greenland at least for the past three decades. American plaice has mostly been taken as by-catch in other fisheries mostly targeting cod, redfish, Greenland halibut and shrimp. Occasionally, when the cod fishery was poor, vessels would turn to other species such as wolffish and American plaice on the banks off West Greenland.

Description of the Fisheries

Reported catches of American plaice increased in the same years as Atlantic wolffish were directly targeted on the banks off West Greenland due to failing cod fisheries (Schmidt, 1980) (Table 1. and Fig 2). The highest reported catches occurred in 1977-1979, but in these years non-Greenlandic vessels were excluded from the valuable cod fishery on the banks off West Greenland and massive misreporting occurred, where cod were reported as American plaice, wolffish or other species (Horsted 1980). Since 2001, grid separators has been mandatory for shrimp trawlers operating offshore in order to reduce the number of fish discarded (GH 2001) and sorting grids have also been mandatory for the smaller shrimp trawlers operating inshore since 2011 (GS 2011). Studies of by-catch and effect of sorting grids in the shrimp fishery estimated the by-catch of American plaice to be between 0.14-0.46 % dependant on division (Sünksen 2007). Earlier studies of by-catch composition (Engelstoft 1996) are not directly comparable for American plaice.

Commercial fishery data

American plaice do not appear in logbooks or in factory landings reports and no data information of any catches were observed. Also, no quantitative information on the amount of American plaice discarded in the by-catches of the shrimp fishery was available as American plaice is likely reported as finfish not specified (FAO:MZZ).

Survey data

There are two surveys partly covering the American plaice stock in subarea 1. The EU-Germany survey (Fock and Stransky 2013) and Greenland Shrimp Fish survey in West Greenland (Nygaard and Jørgensen 2014). The EU-Germany survey has a smaller depth coverage (0-400m, 1Bs-F), than the Greenland Shrimp Fish survey in West Greenland (0-600m, 1A-F). However, the EU Germany survey has a longer time series (since 1982) than the Greenland Shrimp and Fish survey in West Greenland (since 1992).

Assessment

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

Biomass indices decreased during the 1980s in the EU-Germany survey, particularly from 1988 to 1990 when the last major year-class of cod were fished in South-west Greenland (1984 YC), but increased from 2002 to 2005. Since then the biomass indices have decreased. The biomass indices in the Greenland Shrimp and fish survey steadily increased from 1992 to the gear change in 2004. After 2005 the indices have fluctuated without a clear trend. The difference in the indices between the two surveys is mainly due to the partial overlap of the surveys. The decreasing trend observed in the EU-Germany survey since 2005 is also observed in the overlapping divisions of the Greenland shrimp and fish survey (1Bs-F), but is cancelled by an increase in the northern divisions (1A-Bn, fig 5). Therefore the stock seems to be at a stable level although far below the biomass observed in the 1980's.

Estimation of SSB and recruitment

The spawning stock biomass was estimated assuming knife edge maturity at 20 cm for American plaice applied to the length disaggregated abundance indices derived from the EU-German survey. Recruitment was estimated as the abundance of length groups 15-20 cm, taken as proxies for recruitment at age 5. (Fig. 4) SSB increased in 2003 and 2004, but is still considered to be at low level compared to the early and mid-1980s.
A stock recruitment plot can be estimated by combining the recruitment at age 5 with the estimated SSB 5 years earlier. Thus the most recent year is 2008, which is estimated as the 2013 abundance of 15-20 cm American plaice plotted against the 2008 biomass of individuals > 20 cm (Fig 5). The SSB plotted against recruitment at age 5 reveals decreasing values of both SSB and recruitment, with a few incidents of high recruitment. There could be many different explanation for such a pattern, for instance, higher spawning success in recent years compared to a low survival of recruits in the beginning of the 1980's, changes in distribution of the stock or low overlap of the survey and SSB).

Assessment results

The stock of American plaice in subarea 1 seems to be at a stable level, slightly higher than the 1990's level, but far below the 1980's. Recruitment is lower than the initial values observed in initial years of the EU-Germany survey.

References

Engelstoft J.J. 1996. By-Catches in the Shrimp Fishery at West Greenland. NAFO SCR Doc. 96/36. Serial No. N2711

Fock H. and Stransky C. 2013. Stock Abundance Indices and Length Compositions of Demersal Redfish and Other Finfish in NAFO Sub-area 1 and near bottom water temperature derived from the German bottom trawl survey 1982-2012. NAFO SCR Doc. 13/015, Ser. No. N6166.

G.H. 2001. Hjemmestyrets bekendtgørelse nr. 39 af 6. december 2001 om regulering af fiskeri ved tekniske bevaringsforanstaltninger. (available online on)

G.S. 2011. Selvstyrets bekendtgørelse nr. 12 af 17. november 2011 om tekniske bevaringsforanstaltninger i fiskeriet http://lovgivning.gl/lov?rid={0F40DF8E-7625-4C33-90EA-8A62F02061AB}

Horsted S. A. 1980. Data for 1979 and earl 1980, and Estimates of Stock and Yield for 1980-82. NAFO SCR Doc. 80/VI/72 Serial No. N124 (Revised)

Nygaard R. and Jørgensen O.A. 2014. Biomass and Abundance of Demersal Fish Stocks off West and East Greenland estimated from the Greenland Institute of Natural resources Shrimp Fish Survey, 1988-2013. NAFO SCR Doc. 14/003, Ser. No. N6293.

Nygaard R. 2014. Denmark/Greenland Research Report for 2013. NAFO SCS Doc. 14/12, Ser. No. N6307.

Riget, F., J. Boje and K. Lehman 1988. By-catches of Greenland Halibut and Redfish in the Shrimp Fishery at West Greenland. NAFO SCR Doc. 88/12.

Sünksen, K. 2007: Discarded by-catch in shrimp fisheries in Greenlandic offshore waters 2006-2007. NAFO SCR Doc. 07/88

Table 1. Annual nominal catches of other finfish in Subarea 1 derived from Statlant 21

YEAR	1A	1B	1C	1D	1E	1F	1NK	Total	note
1960					15			15	
1961									
1962		5	1	1	2			9	
1963		2	28	9	5			44	
1964			1	2	1	1		5	
1965		1	7	35				43	
1966		5	2	4		3		14	
1967			23	34	1			58	
1968		16	14	9	9	14		62	
1969									
1970			14	101	18			133	
1971		4	8	773	1		3	789	
1972			11	80	6	4	22	123	
1973		4	9	55	1088	7		1163	
1974		11	1837	89	36	5		1978	
1975		74	1980	256		1		2311	
1976		28	1525	146	65	101		1865	
1977			562	1960	238	699		3459	1
1978			167	2205	2251	940		5563	1
1979			947	2879	1076	601		5503	1
1980			407	285	168	440		1300	
1981			87		49	25		161	
1982			207	602	56	19		884	
1983					55	18		73	
1984					1			1	
1985				5	4			9	
1986					5			5	
1987							2	2	
1988									
1989									
1990									
1991					2			2	
1992									
1993									
1994									
1995									
1996									
1997									
1998				4				4	
1999	3							3	
2000									
2001					3		1	4	
2002									
2003									
2004									
2005									
2006									
2007									
2008									
2009									
2010									
2011									
2012									
2013									

Notes

1 - Unreliable statlant 21 catches. See S.A. Horsted 1980, for discussion.

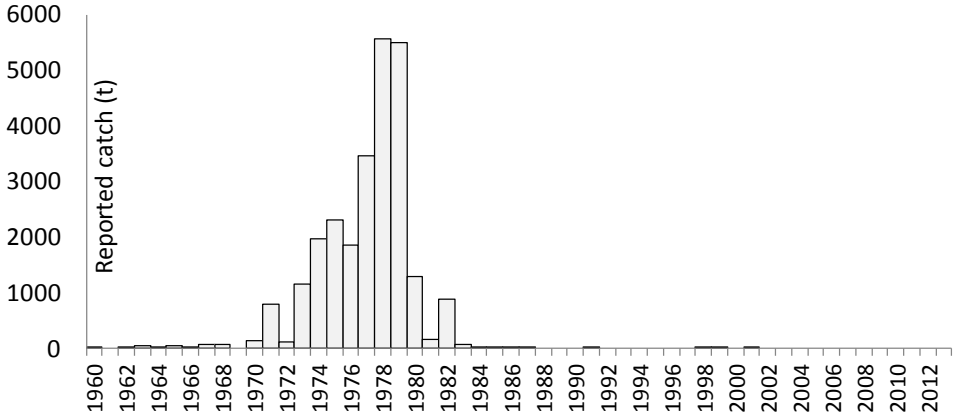

Fig 1. Reported catches of American plaice in SA1 from 1960 to present. Reported catches in 1977 to 1979 are unreliable.

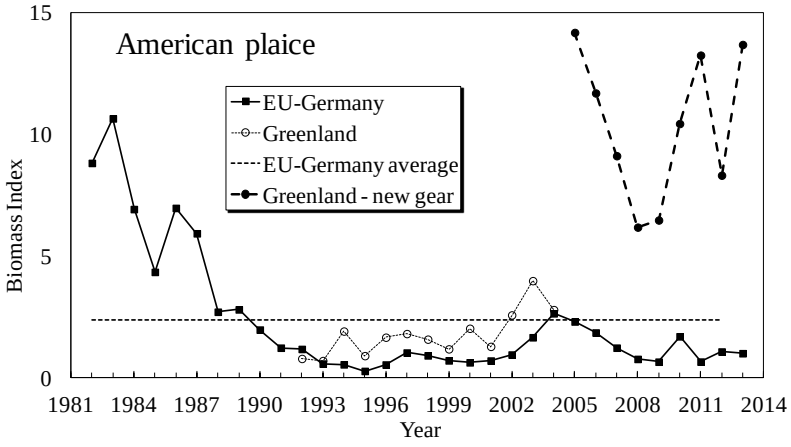

Fig. 2. Finfish in Subarea 1: Biomass indices from The EU-Germany survey and the Greenland shrimp and fish survey (SFW). The gear was changed in the Greenland survey between 2004 and 2005.

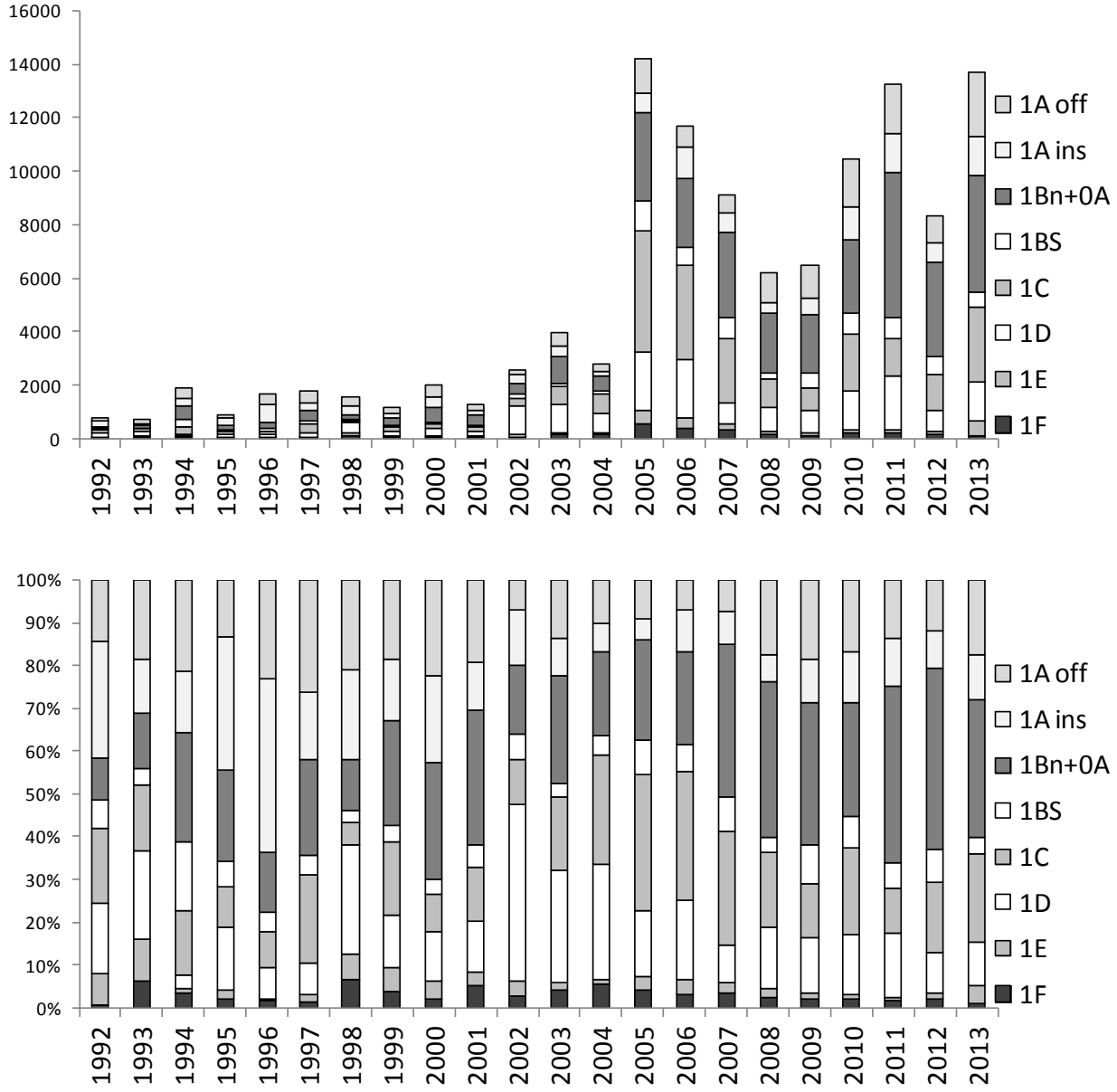

Fig. 3. American plaice in Subarea 1: Distribution of biomass in the Greenland shrimp and fish survey by tons (top) and by percent (bottom). The gear was changed in the survey between 2004 and 2005. Division 1Bs-1F are divisions normally covered by the EU-Germany survey.

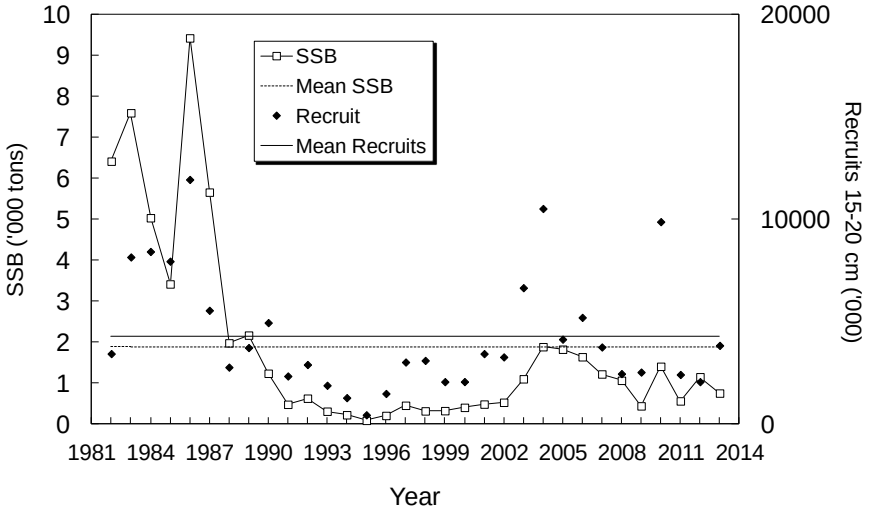

Fig. 4. American plaice Subarea 1. SSB and recruitment indices as derived from the EU-Germany groundfish survey.

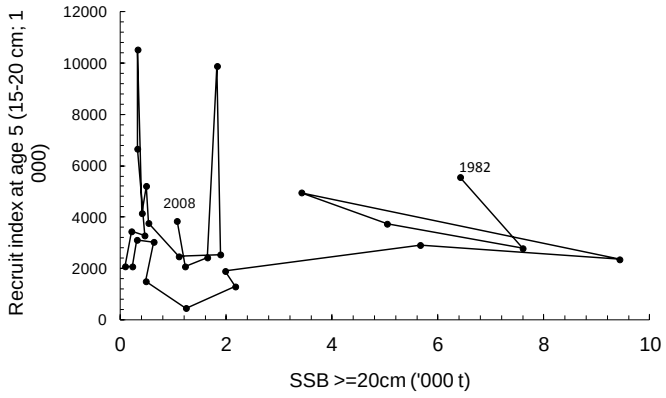

Fig. 5. American plaice Subarea 1. SSB-recruitment plot.