

Working Document #15 to the  
Arctic Fisheries Working Group  
23 April-2 May 2003

# **NORWEGIAN TRAWL CPUE ANALYSIS FOR NEA SAITHE**

By

Sigbjørn Mehl and Åge Fotland  
Institute of Marine Research  
Bergen, Norway

At the AFWG meeting in 2002 it was expressed concern about the result of the Northeast Arctic saithe trawl CPUE analysis and that the input data and analysis were inappropriately explained.

In 2000 new estimates of CPUE indices by age based on the logbook database having daily resolution were presented (Mehl, WD 20 2000). After some initial analyses, it was decided to only include data from vessels larger than the median length since they showed the least noisy trends. One single CPUE observation from a given vessel is the total catch per day divided by the duration of all the trawl hauls that day. To increase the number of observations during a time period with decreasing directed saithe fishery, all days with 20% or more saithe were included. The effort (hours trawling) for each CPUE observation is standardised or calibrated to a standard vessel. Until 1992, a yearly index was calculated by first averaging all CPUE observations for each month, and then averaging over the year. The CPUE indices were splitted on age groups by quarterly weight, length and age data from the trawl fishery. In the present analysis, a yearly index is calculated by first averaging all CPUE observations for each quarter, and then averaging over the year. The CPUE indices are finally splitted on age groups by yearly catch in numbers and weight at age data from the trawl fishery. The new approach is less influenced by short periods with poor data, while it still evens out seasonal variations.

In 1992, the Directorate of Fishery changed the format of the logbook data. The CPUE analyses show some discrepancies in the results when merging the time series based on old and new data format. The result was different when the time series for 1980-1991 was put first and then the time series for 1992-2002 was added, compared to vice versa (Table 1 column A and B). When the time series are analysed separately (Table 1 column B and C), the results are similar to the analysis where 1980-1991 are put first. In the 2002 NEA Saithe assessment, the CPUE time series was based on analysis with new format for year 2000 and 2001 only, resulting in similar errors.

The discrepancies were caused by change from lower to upper case in column heading and change in duration from hour and minutes to decimal representation of time. The software treated the columns according to the format of the first year. All data have been updated to the latest format and the CPUE have been recalculated backwards to 1980 (Table 2 column A). Table 2 column B and C presents the CPUE for separate analysis, and the results are the same as for the combined analysis.

Updated 2002 XSA-analysis resulted in relatively small changes (F3-6 in 2001 of 0.24 compared to 0.22).

#### References:

Mehl, S., Overvik, M. and Salthaug, A. 2000. Revised tuning data for Northeast Arctic saithe. Working Document to the Arctic Fisheries Working Group, 22 - 31 August 2000.

ICES. (Aglen, A., Albert, O. T., Berg, E., Bogstad, B., Fotland, Å., Høines, Å., Korsbrekke, K., Loeng, H., Marshall, T., Mehl, S., Nedreaas, K., Sunnanå, K., Åsnes, M. et al.) 2002. Report of the Arctic Fisheries Working Group, ICES Headquarters 16-25 April 2002.. ICES CM 2002/ACFM: 18. 451 pp.

Table 1. Northeast Arctic saithe. Trawl CPUE time series analysed for data merged from 1992-2002 + 1980-1991 (A), vice versa (B) and separate analysis (C) and (D)

Obs	AAR	CPUE A	CPUE B	CPUE C	CPUE D
1	80	616,398	616,400	616,398	
2	81	698,607	698,610	698,607	
3	82	723,884	723,880	723,884	
4	83	853,307	853,310	853,307	
5	84	786,127	786,130	786,127	
6	85	640,706	640,710	640,706	
7	86	656,629	656,630	656,629	
8	87	754,461	754,460	754,461	
9	88	627,954	627,950	627,954	
10	89	654,395	654,390	654,395	
11	90	571,747	571,750	571,747	
12	91	633,310	633,310	633,310	
13	1992	883,571	1177,290		883,571
14	1993	923,323	1268,870		923,323
15	1994	846,402	1103,350		846,402
16	1995	961,257	1342,370		961,257
17	1996	846,427	1317,800		846,427
18	1997	992,352	1812,670		992,352
19	1998	510,981	956,600		510,981
20	1999	488,974	970,710		488,974
21	2000	686,651	1115,930		686,651
22	2001	936,367	1470,700		936,367

Table 2 Northeast Arctic saithe. Trawl CPUE time series analysed for revised full time series and separate analysis (C) and (D)

Obs	AAR	CPUE A	CPUE B	CPUE C
1	1980	618,453	618,453	
2	1981	727,080	727,080	
3	1982	723,884	723,884	
4	1983	870,162	870,162	
5	1984	795,481	795,481	
6	1985	663,195	663,195	
7	1986	657,768	657,768	
8	1987	775,574	775,574	
9	1988	644,870	644,870	
10	1989	663,757	663,757	
11	1990	589,806	589,806	
12	1991	669,464	669,464	
13	1992	886,803		886,803
14	1993	939,482		939,482
15	1994	856,321		856,321
16	1995	975,367		975,367
17	1996	847,335		847,335
18	1997	995,650		995,650
19	1998	509,127		509,127
20	1999	509,268		509,268
21	2000	686,651		686,651
22	2001	924,990		924,990
23	2002	894,942		894,942

