

2.4.11 Capelin in the Iceland–East Greenland–Jan Mayen area (Subareas V and XIV and Division IIa west of 5°W)

State of the stock

In the absence of defined reference points, the state of the stock is unknown. The SSB is highly variable because it is dependent on only two age groups. It is estimated that 410 000 t were left for spawning in spring 2007. In the years 2002–2005 no recruitment estimates were available from surveys. An estimate for the 2005 year class is available from an acoustic survey in November 2006. It is estimated low, but sufficient to allow a fishery in 2007/08.

Management objectives

The fishery is managed according to a two-step management plan which requires a minimum spawning-stock biomass of 400 000 t by the end of the fishing season. The first step in this plan is to set a preliminary TAC based on the results of an acoustic survey carried out to evaluate the immature (age 1 and most of age 2) part of the capelin stock about a year before it enters the fishable stock. The initial quota is set at 2/3 of the preliminary TAC, calculated on the condition that 400 000 t of the SSB should be left for spawning. The second step is based on the results of another survey conducted during the fishing season for the same year classes. This result is used to revise the TAC, still based on the condition that 400 000 t of the SSB should be left for spawning.

ICES has not evaluated the management plan with respect to its conformity to the precautionary approach.

Single-stock exploitation boundaries

Exploitation boundaries in relation to existing management plans

With the estimate of the 2005 year class a TAC could be predicted. As the predicted TAC is relatively low, it is suggested that no summer fishery should be allowed. The starting quota will be 206 000 t (2/3 of predicted TAC 308 000 t) assuming that the fishery starts in the beginning of November 2007.

Short-term implications

An estimate of the 2005 year class (immature age 1 capelin) is available from an acoustic survey in November 2006. It is estimated as relatively low. With this estimate a preliminary TAC could be set for the 2007/08 season. This may be revised when new information on the abundance of the whole stock becomes available.

Management considerations

The fishery is mainly an industrial fishery based on maturing capelin, i.e. age 2 and age 3 in the autumn, which spawn at ages 3 and 4 in March of the following year.

Factors affecting the fisheries and the stock

Regulations and their effects

Discards are allowed when catches are beyond the carrying capacity of the vessel. Methods of transferring catches from the purse seine of one vessel to another vessel were invented long ago, and since skippers of purse-seine vessels prefer to operate in groups, discards are practically zero. In the pelagic trawl fishery, such large catches of capelin rarely occur.

A regulation calling for immediate, temporary area closures when high abundance of juveniles are measured in the catch (more than 20% of the catch composed of fish less than 13 cm) is enforced, using on-board observers.

Ecosystem considerations

Capelin is an important forage fish and declines in stock may be expected to have implications for the productivity of their predators.

The environment

The decline in stock abundance in the early 1990s was likely to be due to natural causes (Vilhjálmsón, 2002; Guðmundsdóttir and Vilhjálmsón, 2002).

Distribution of the stock may have changed in response to environmental factors. Icelandic waters are characterized by highly variable hydrographical conditions, with temperatures and salinities depending on the strength of Atlantic inflow through the Denmark Strait and the variable flow of polar water from the north.

In the years 2002–2005, great difficulties were encountered in locating and assessing the juvenile part of the stock (ages 1 and 2; and ages 2 and 3 after 31 December). In this period, the quarterly monitoring of environmental conditions of Icelandic waters shows a rise in sea temperatures north and east of Iceland, which probably also reaches farther north and northwest. The temperature increase is so great that it may have led to displacements of the juvenile part of the capelin stock. In 2006 the 2005 year class was observed in its traditional locations on the continental shelf.

Scientific basis

Data and methods

The basis for stock assessment and short-term forecasts of the Icelandic capelin are several acoustic surveys.

Sources of information

Guðmundsdóttir, A., and Vilhjálmsson, H. 2002. Predicting total allowable catches for Icelandic capelin, 1978–2001. ICES Marine Science Symposia, 216: 115–1115.

ICES. 2007. Report of the North Western Working Group, 24 April–3 May 2007. ICES CM 2007/ACFM:17.

Vilhjálmsson, H. 2002. Capelin (*Mallotus villosus*) in the Iceland–East Greenland–Jan Mayen ecosystem. ICES Marine Science Symposia, 216: 870–883.

Year	ICES Advice	Predicted catch ¹ corresp. to advice	Agreed ² TAC	ACFM Catch ³
1986	TAC	1,100	1,290	1,333
1987	TAC ¹	500	1,115	1,116
1988	TAC ¹	900	1,065	1,036
1989	TAC ¹	900	*	808
1990	TAC ¹	600	250	314
1991	No fishery pending survey results ¹	0	740	677
1992	Precautionary TAC ¹	500	900	788
1993	TAC ¹	900	1,250	1,179
1994	Apply the harvest control rule	950	850	842
1995	Apply the harvest control rule	800	1,390	930
1996	Apply the harvest control rule	1,100	1,600	1,571
1997	Apply the harvest control rule	850	1,265	1,245
1998	Apply the harvest control rule	950	1,200	1,100
1999	Apply the harvest control rule	866	1,000	934
2000	Apply the harvest control rule	650	1,090	1,071
2001	Apply the harvest control rule	700	1,300	1,250
2002	Apply the harvest control rule	690	1,000	988
2003	Apply the harvest control rule	835	900	741
2004	Apply the harvest control rule	*335	985	784
2005	Apply the harvest control rule	**No fishery	235	238
2006/07	Apply the harvest control rule	**No fishery	385	377
2007/08	Apply the harvest control rule	207		

Weights in '000 t.

¹)TAC advised for the July–December part of the season.

²)Final TAC recommended by national scientists for the whole season.

³)July–March of following year.

*Preliminary TAC set according to the results of an assessment survey in late June/early July 2004.

**All surveys of the prospective 2005/06 fishable stock abundance during the 2004/2005 season were unsuccessful.

The advice is preliminary and subject to revision following results of further surveys.

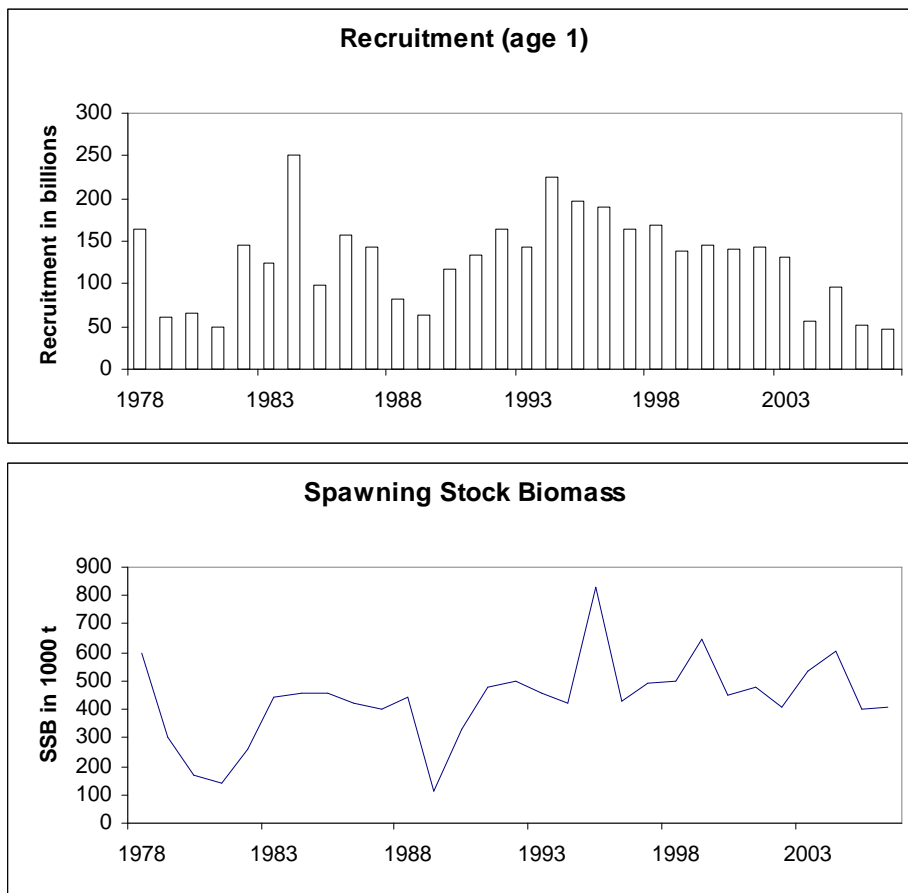


Figure 2.4.11.1 Capelin in the Iceland–East Greenland–Jan Mayen area (Subareas V and XIV and Division IIa west of 5°W). Recruitment. Spawning stock biomass.

Table 2.4.11.1

Capelin in the Iceland–East Greenland–Jan Mayen area 1978/79–2007/08. Recruitment of 1-year-old fish (unit 10^9) and total stock biomass ('000 t) are given for 1 August. Spawning-stock biomass ('000 t) is given at the time of spawning (March next year). Landings ('000 t) are the sum of the total landings in the season starting in the summer/autumn of the year indicated and ending in March of the following year.

Year	Total			Spawning-stock biomass
	Recruitment	Stock biomass	Landings	
1978/79	164	2832	1195	600
1979/80	60	2135	980	300
1980/81	66	1130	684	170
1981/82	49	1038	626	140
1982/83	146	1020	0	260
1983/84	124	2070	573	440
1984/85	251	2427	897	460
1985/86	99	2811	1312	460
1986/87	156	3106	1333	420
1987/88	144	2639	1116	400
1988/89	81	2101	1037	440
1989/90	64	1482	808	115
1990/91	118	1293	314	330
1991/92	133	1975	677	475
1992/93	163	2058	788	499
1993/94	144	2287	1179	460
1994/95	224	2287	864	420
1995/96	197	3007	929	830
1996/97	191	2885	1571	430
1997/98	165	2348	1245	492
1998/99	168	2197	1100	500
1999/00	138	2315	933	650
2000/01	146	2164	1071	450
2001/02	140	2432	1249	475
2002/03	142	1993	988	410
2003/04	132	2540	741	535
2004/05	57	1651	783	602
2005/06	95*	975*	238	400
2006/07	51*	1177*	377	410
2007/08 ¹⁾	NA			400

*Preliminary.

NA: Not available.