

ECOREGION **Barents Sea and Norwegian Sea**
STOCK **Greenland halibut in Subareas I and II**

Advice for 2012

ICES advises on the basis of precautionary considerations that catches should not be allowed to increase.

Stock status

F (Fishing Mortality)	
	2008-2010
MSY (F_{MSY})	Unknown
Precautionary approach (F_{pa}, F_{lim})	Unknown
SSB (Spawning-Stock Biomass)	
	2009-2011
MSY ($B_{trigger}$)	Unknown
Precautionary approach (B_{pa}, B_{lim})	Unknown
Qualitative evaluation	Increasing trend

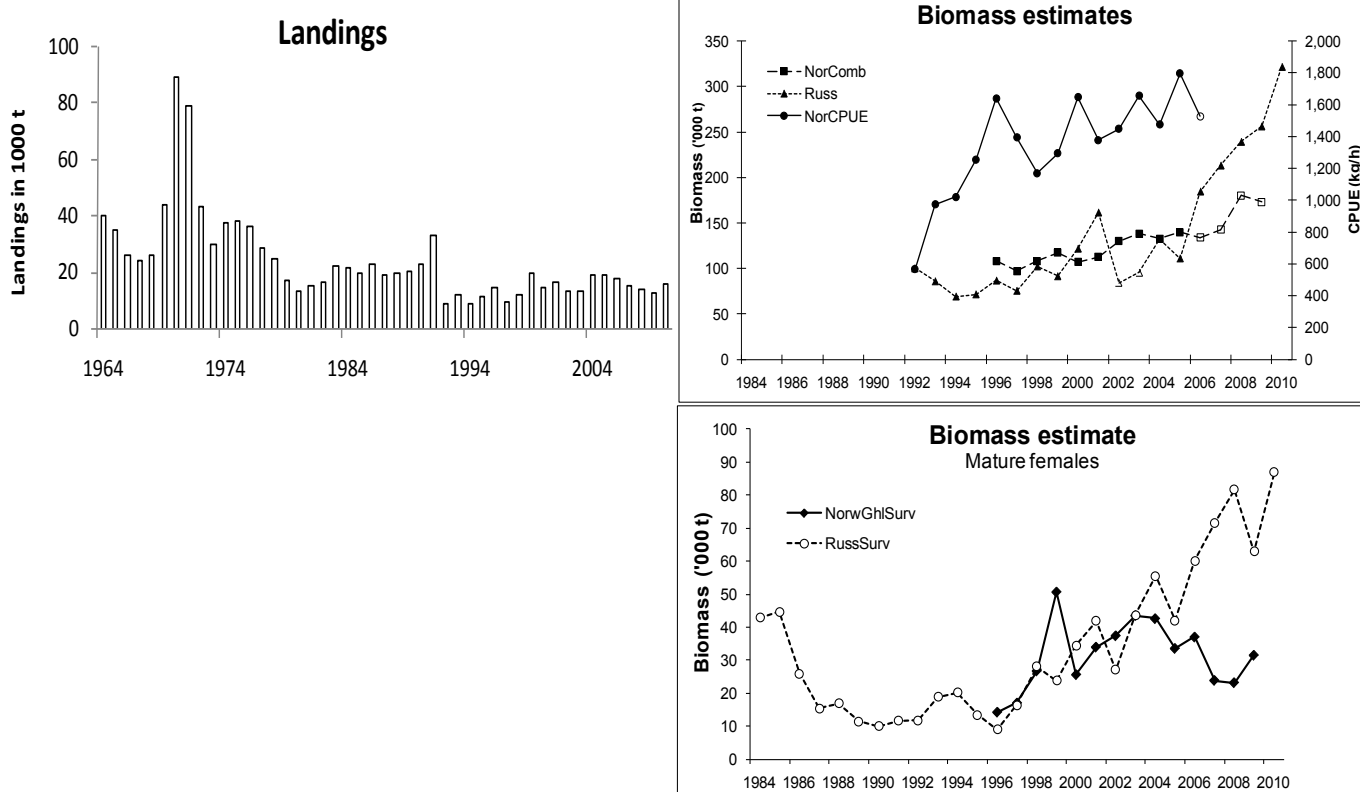


Figure 3.4.7.1 Greenland halibut in Subareas I and II. Landings (‘000 t). Top right: Biomass estimates from different tuning series. Below right: Biomass (swept area) estimate of the mature female biomass (Norwegian Greenland halibut survey along the continental slope in August and Russian trawl survey).

Only landings and survey trends of biomass are available for this stock. The total stock has shown a positive trend since catches were reduced in 1992, especially in most recent years. For this long-lived species this is a positive sign regarding recruitment into the fisheries. Increase in mature female biomass is not as marked. There is no information on the exploitation rate of the stock.

Management plans

No specific management objectives are known to ICES.

Biology

Greenland halibut is a long-lived species showing considerable sexual dimorphism in growth and maturation. Age-reading methodology for this stock has been under revision for several years and work is ongoing to reach clarification.

Tagging studies suggest that some mixing occurs with Greenland halibut in the Iceland/East Greenland area.

The fisheries

Greenland halibut is fished in a directed fishery (time- and area-limited) by gillnet and longline, as well as bycatch in the trawl fishery for other demersal species.

Catch by fleet	Total catch (2010) = 15.7 kt, where 100% landings (55% trawl, 35% longline, 9% gillnet, and 1% others).
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Quality considerations

None of the current surveys cover the complete stock distribution.

Scientific basis

Assessment type	Survey trends-based assessment.
Input data	Two survey indices (Norwegian Combined Survey NO-GH-Btr-Q3, Russian autumn survey RU-BTr-Q4). One commercial index (Norwegian cpue).
Discards and bycatch	Not included in the assessment.
Indicators	Survey indices and exploratory XSA.
Other information	A benchmark is intended for 2013.
Working group report	AFWG

ECOREGION **Barents Sea and Norwegian Sea**
STOCK **Greenland halibut in Subareas I and II****Reference points**

No reference points are defined for this stock.

Outlook for 2012

No analytical assessment can be presented for this stock. Therefore, fishing possibilities cannot be projected.

Precautionary considerations

There are signs that the rebuilding strategy for this stock of the last two decades is improving the status of the stock, and measures should be taken to maintain the positive trends. ICES advises on the basis of precautionary considerations that catches should not be allowed to increase above 15 000 t, the average catch for the last 10 years.

Additional considerations

The 38th Joint Russian–Norwegian Fisheries Commission (JRNFC)'s Session in 2009 decided to cancel the ban against targeted Greenland halibut fishery and established the TAC at 15 000 t for 2010 until 2012.

The benchmark for the Northeast Arctic (NEA) Greenland halibut stock is planned for 2013.

To reestablish an accepted analytical age-structured assessment for this stock requires recalculations of catch and survey data back in time that incorporates changes in growth functions. An approach recommended by ICES (2011b) can be used to establish the best possible available growth model for NEA Greenland halibut, combined with length–frequency distributions and some assumptions on variation in growth to reconstruct age specific input matrices back in time. This should be programmed in such a way that it is easy to compare the effect of different growth functions on assessment outputs, including reference points. An assessment model approach that copes with uncertainty in commercial catch and survey data is preferable.

Biomass surveys

The Norwegian August survey covers the continental slope from Norway to west of Spitsbergen (68–80°N, 400–1500 m depth) including the main spawning areas, and thus covers the adult part of the population. This survey was not conducted in 2010, but will be continued biennially starting in 2011. The Russian October–December survey (100–900 m depth) does not go as far south on the slope (ca 71°N), but covers adult areas on the northern slope and additionally extends east into central parts of the Barents Sea where catches contain a higher proportion of immature Greenland halibut.

Exploratory assessment

An XSA assessment was calculated based on the old age-reading method. Due to age-reading and input data quality problems this should be regarded as an exploratory run and just used to view trends in the stock. The assessment suggests that the total stock has had an increasing trend since 1992 and this is also seen in the SSB from 1995 to 2004. In 2004–2009 the SSB shows a decreasing signal until a significant increase is seen in 2010. Three tuning series were used in this analysis (Figure 3.4.7.1). The Russian autumn survey is the only tuning series with data after 2005, when Norway discontinued the updating of age data. Some years were excluded from the tuning (marked with open symbols in Figure 3.4.7.1). The Russian survey in 2002 and 2003 was excluded due to nonstandard survey coverage/time. The Norwegian Combined Survey in 2006–2009 and Norwegian cpue in 2006 were excluded due to lack of age readings.

Age-reading issues have not yet been fully resolved for this stock. If the new age-reading methods are to be the basis for advice, a sufficient number of fish need to be aged annually. At present, there is no routine programme in place for reading otoliths with the new age-reading methods.

Comparison with previous assessment and advice

The basis for the assessment has not changed from last year (survey trends). In 2010 the perception of the stock was still considered relatively low. This year the indicators for the total biomass are interpreted as showing signs of improvement in the stock.

The basis for the advice is the same as last year: precautionary considerations.

Sources

ICES. 2011a. Report of the Arctic Fisheries Working Group, 28 April–4 May 2011. ICES CM 2011/ACOM:05.

ICES. 2011b. Report of the Workshop on Age Reading of Greenland Halibut (WKARGH), 14–17 February 2011, Vigo, Spain. ICES CM 2011/ACOM:41. 39 pp.

Table 3.4.7.1 Greenland halibut in Subareas I and II. Advice, management, and landings.

Year	ICES Advice	Predicted catch corresp. to advice	Agreed TAC	Official Landings	Discards	ICES Landings
1987	Precautionary TAC	-	-	19	-	19
1988	No decrease in SSB	19	-	20	-	20
1989	F = F(87); TAC	21	-	20	-	20
1990	F = F (89); TAC	15	-	23	-	23
1991	F at F _{med} ; TAC; improved expl. pattern	9	-	33	-	33
1992	Rebuild SSB(1991)	6	7 ¹	9	-	9
1993	TAC	7	7 ¹	12	-	12
1994	F < 0.1	< 12	11 ¹	9	-	9
1995	No fishing	0	2.5 ²	11	-	11
1996	No fishing	0	2.5 ²	14	-	14
1997	No fishing	0	2.5 ²	10	-	10
1998	No fishing	0	2.5 ²	13	-	13
1999	No fishing	0	2.5 ²	19	-	19
2000	No fishing	0	2.5 ²	14	-	14
2001	Reduce catch to rebuild stock	< 11	2.5 ²	16	-	16
2002	Reduce F substantially	< 11	2.5 ²	13	-	13
2003	Reduce catch to increase stock	< 13	2.5 ²	13	-	13
2004	Do not exceed recent low catches	< 13	2.5 ²	19	-	19
2005	Do not exceed recent low catches	< 13	2.5 ²	19	-	19
2006	Do not exceed recent low catches	< 13	2.5 ²	18	-	18
2007	Reduce catch to increase stock	< 13	2.5 ²	15	-	15
2008	Reduce catch to increase stock	< 13	2.5 ²	14	-	14
2009	Same advice as last year	< 13	2.5 ²	13	-	13
2010	Same advice as last year	< 13	15 ³	16	-	16
2011	Same advice as last year	< 13	15 ³			
2012	No increase in catches	< 15	15 ³			

Weights in '000 t.

¹)Set by Norwegian authorities.

²)Set by Norwegian authorities for the non-trawl fishery; allowable bycatch in the trawl fishery is additional to this.

³)Set by the Joint Russian–Norwegian Fisheries Commission for 2010–2012.

Table 3.4.7.2 Greenland halibut in Subareas I and II. Nominal catch (t) by countries as officially reported to ICES.

Year	Denmark	Estonia	Faroe Isl.	France	Fed. Rep. Germany	Greenland	Ice land	Ire land	Lithuania	Norway	Poland	Portugal	Russia ⁴	Spain	UK (England & Wales)	UK (Scotland)	Total
1984	0	0	0	138	2,165	0	0	0	0	4,376	0	0	15,181	0	23	0	21,883
1985	0	0	0	239	4,000	0	0	0	0	5,464	0	0	10,237	0	5	0	19,945
1986	0	0	42	13	2,718	0	0	0	0	7,890	0	0	12,200	0	10	2	22,875
1987	0	0	0	13	2,024	0	0	0	0	7,261	0	0	9,733	0	61	20	19,112
1988	0	0	186	67	744	0	0	0	0	9,076	0	0	9,430	0	82	2	19,587
1989	0	0	67	31	600	0	0	0	0	10,622	0	0	8,812	0	6	0	20,138
1990	0	0	163	49	954	0	0	0	0	17,243	0	0	4,764 ²	0	10	0	23,183
1991	11	2,564	314	119	101	0	0	0	0	27,587	0	0	2,490 ²	132	0	2	33,320
1992	0	0	16	111	13	13	0	0	0	7,667	0	31	718	23	10	0	8,602
1993	2	0	61	80	22	8	56	0	30	10,380	0	43	1,235	0	16	0	11,933
1994	4	0	18	55	296	3	15	5	4	8,428	0	36	283	1	76	2	9,226
1995	0	0	12	174	35	12	25	2	0	9,368	0	84	794	1 106	115	7	11,734
1996	0	0	2	219	81	123	70	0	0	11,623	0	79	1,576	200	317	57	14,347
1997	0	0	27	253	56	0	62	2	0	7,661	12	50	1,038	157 ²	67	25	9,410
1998	0	0	57	67	34	0	23	2	0	8,435	31	99	2,659	259 ²	182	45	11,893
1999	0	0	94	0	34	38	7	2	0	15,004	8	49	3,823	319 ²	94	45	19,517
2000	0	0	0	45	15	0	16	1	0	9,083	3	37	4,568	375 ²	111	43	14,297
2001	0	0	0	122	58	0	9	1	0	10,896 ²	2	35	4,694	418 ²	100	30	16,365
2002	0	219	0	7	42	22	4	6	0	7,011 ²	5	14	5,584	178 ²	41	28	13,161
2003	0	0	459	2	18	14	0	1	0	8,347 ²	5	19	4,384	230 ²	41	58	13,578
2004	0	0	0	0	9	0	9	0	0	13,840 ²	1 ²	50	4,662	186 ²	43	0	18,800
2005	0	170	0	32	8	0	0	0	0	13,011 ³	0 ²	23	4,883	660 ²	29	18	18,834
2006	0	0	204	46	8	0	8	0	196	11,119 ³	201 ²	26 ²	6,055	27 ²	6	0	17,897
2007 ¹	0	0	203	40	8	0	15	+	0	8,229 ³	200 ²	47 ²	6,484	11 ²	0	0	15,237
2008 ¹	0	0	640	42	5	0	28	0	0	7,394 ³	201	46 ²	5,294	112	16	0	13,778
2009 ¹	0	0	422	16	19	0	0	0	0	8,446 ³	204	239	3,335	210 ²	69	0	12,996
2010 ¹	0	0	271	102	14	0	0	0	0	8,210 ³	0	11	6,888	182 ²	26	0	15,704

¹ Provisional figures.

² Working Group figures.

³ As reported to Norwegian authorities.

⁴ USSR prior to 1991.