

IMR/PINRO

5

2024

Joint Report Series

JOINT



REPORT

**Advice on fishing opportunities  
for Greenland halibut in 2025 and  
2026 in ICES subareas 1 and 2**



Institute of Marine Research – IMR



Polar branch of the FSBSI "VINRO" ("PINRO")

**Title (English and Norwegian):**

Advice on fishing opportunities for Greenland halibut in 2025 and 2026 in ICES subareas 1 and 2

**Report series:**

IMR-PINRO

**Year - No.:**

2024-5

**Date:**

21.06.2024

**Distribution:**

Open

**Author(s):**

Joint Russian-Norwegian Working Group on Arctic Fisheries (JRN-AFWG)

**Number of pages:**

16

Approved by: Research Director(s): Geir Huse Program leader(s): Bjørn Erik Axelsen

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# Stock Name: Northeast Arctic Greenland halibut (ICES areas 1 and 2)

## Advice on fishing opportunities

The Joint Russian-Norwegian Working Group on Arctic Fisheries (JRN-AFWG) advises that when the MSY approach is applied, catches in 2025 should be no more than 12 431 tonnes, and catches in 2026 should be no more than 14 891 tonnes.

## Stock development over time

The female spawning stock biomass (SSB) is below  $B_{pa}$ , above  $B_{lim}$ , and declining. Total harvestable biomass ( $\geq 45$  cm, HSB) is in a rapid decline. Harvest rate is increasing and is now well above the  $HR_{MSY}$ . Since the female SSB is below  $B_{pa}$ , advised fishing mortality is reduced consistent with the MSY approach.

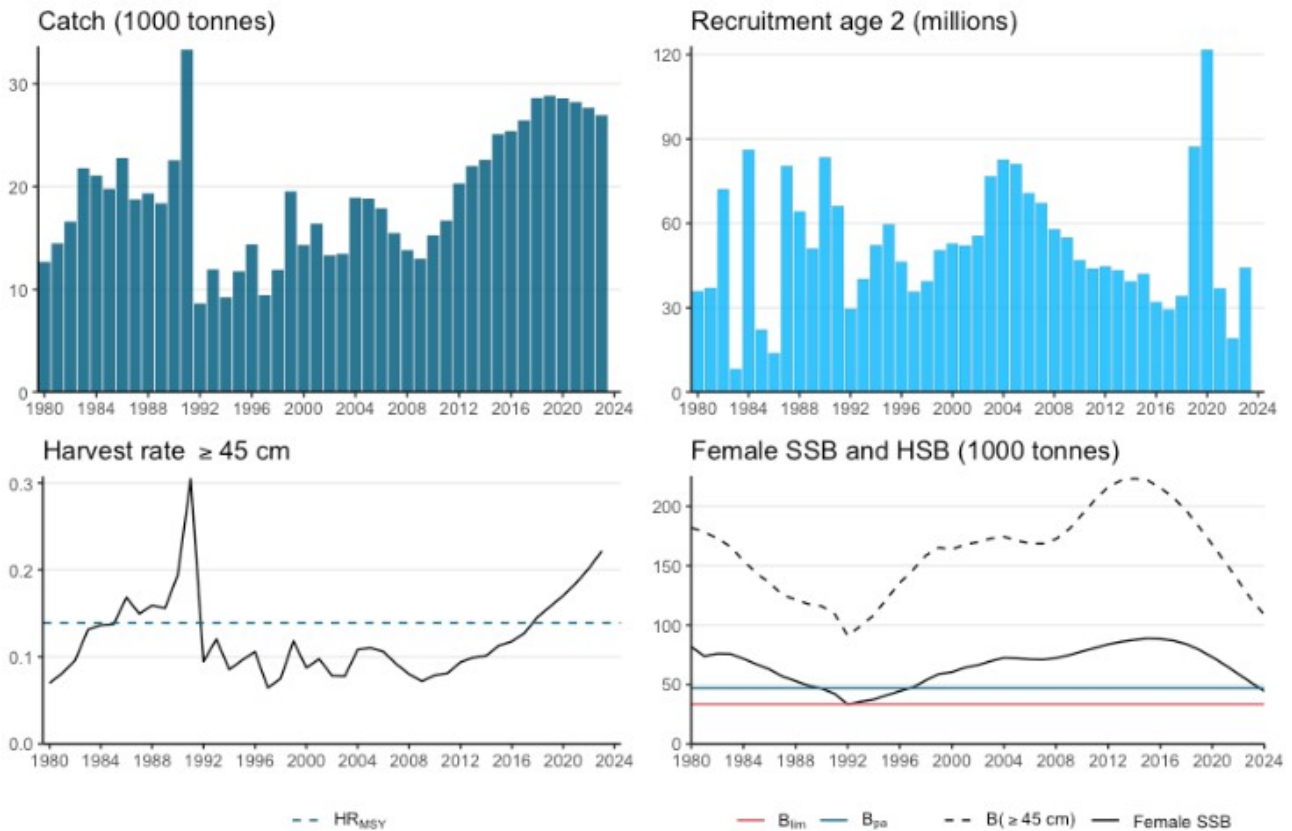


Figure 1. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). From top left to bottom right: catches, recruitment at age 2, harvest rate for fish  $\geq 5$  cm with estimated  $HR_{MSY}$ , and female SSB as well as HSB (harvestable stock biomass defined as  $\geq 45$  cm fish). The biomass reference points relate to female SSB.

## Catch scenarios

The advice for 2025 and 2026 is lower than the advice for 2024 due to high fishing pressure resulting in

decreasing stock size and the female SSB stock being under  $B_{pa}$ .

Table 1. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Assumptions made for the interim year and values in the forecast. Biomasses and catch in tonnes, and recruitment in thousands.

Variable	Value	Notes
Harvest rate $\geq 45$ cm (2024)	0.2 12	Based on expected catch in 2024.
Biomass $\geq 45$ cm (2025)	106 039	Beginning of 202 5.
Female SSB (2025)	39 462	Beginning of 202 5.
Recruitment age 1 (2024 -2026)	50 972	Average 1990-2017 recruitment. Does not influence short-term forecast .
Assumed catch (2024)	23 050	TAC for 2024 plus mean catch above TAC 2018-2023 (1800 t).

Table 2. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Annual catch scenarios for 2025. All weights are in tonnes. The advice basis using the MSY approach, and three other scenarios are listed in the first column. Columns thereafter: total allowable catch (TAC), harvest rate (HR) for  $\geq 45$  cm fish, female spawning stock biomass (SSB) in the beginning of 2026.

Basis	Total catch (2025)	HR (2025)	SSB (2026)	% SSB change*	% TAC change**	% Advice change***
Advice basis						
MSY approach: $HR_{MSY} \times SSB_{2025} / B_{pa}$	12 431	0.117	41 231	4.5	-42	- 20
Other scenarios						
$HR_{MSY}$	14 726	0.139	40 214	1.9	-31	-5.4
HR=0	0	0	46 739	18	-100	-100
Assumed catch in 2024	23 050	0.217	35 756	-9.4	8.5	48

\* SSB start of 2026 relative to end of 2024.

\*\* Advice value for 2025 relative to the TAC value in 2024 (21 250 tonnes).

\*\*\* Advice value for 202 5 relative to the advice value for 202 4 (15 560 tonnes) .

Table 3. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Annual catch scenarios for 2026. All weights are in tonnes. The advice basis using MSY approach, and three other scenarios are listed in the first column. Columns thereafter: total allowable catch (TAC), harvest rate (HR) for  $\geq 45$  cm fish, female spawning stock biomass (SSB) in the beginning of 2027.

Basis	Total catch (2026)	HR (2026)	SSB (2027)	% SSB change*	% TAC change**	% Advice change***
Advice basis						
MSY approach: $HR_{MSY} \times SSB_{2026} / B_{pa}$	14 891	0.123	43 042	9.1	-30	-4.3
Other scenarios						
$HR_{MSY}$	16 538	0.139	41 278	4.6	-22	6.3
HR=0	0	0	55 330	40	-100	-100
Assumed catch in 2024	23 050	0.209	33 330	-16	8.5	48

\* SSB start of 2027 relative to end of 2024, i.e the cumulative change over the 2-year advice period.

\*\* Advice value for 2026 relative to the TAC value in 2024 (21 250 tonnes).

\*\*\* Advice value for 2026 relative to the advice value for 2024 (15 560 tonnes) .

## Basis of the advice

Table 4. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). The basis of the advice.

<b>Advice basis</b>	MSY
<b>Management plan</b>	There is no agreed precautionary management plan for Greenland halibut in this area.

## Quality of the assessment

There was an ICES benchmark between the 2021 and 2023 assessment. The new assessment (including age data) results in considerably lower biomass levels and higher harvest rate, but the trends and catch advice are similar. This revision suggests that the stock is more impacted by the current level of catch above advice than was previously believed. In the 2021 assessment the biomass trends were considered reliable, but the absolute level of biomass was considered highly uncertain. Although the inclusion of age data is likely to have improved the estimation of absolute biomass, this should still be considered uncertain.

Peaks in recruitment were most likely exaggerated in the previous assessment model. There is evidence for a good recruitment event in 2019, although the magnitude of this is still uncertain.

The 2024 assessment is consistent with the 2023 assessment and continues along the expected trends (Figure 2).

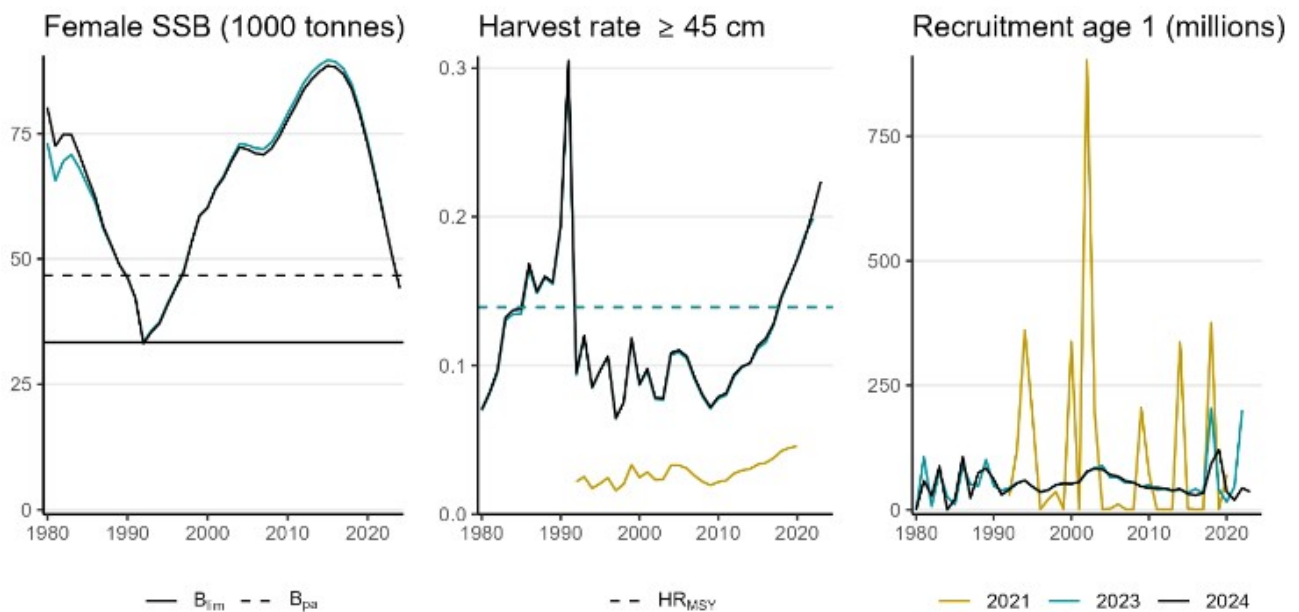


Figure 2. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Historical assessment results. Black lines; 2024 assessment. Blue lines; 2023 assessment. Yellow lines; 2021 assessment. Reference points refer to the new assessment model results only (2024, 2023). Female SSB was missing from the 2021 model.

## Issues relevant for the advice

Due to the temporary suspension of Russian scientists from ICES, this assessment was conducted by a Joint

Russian-Norwegian Arctic Fisheries Working Group (JRN-AFWG) consisting of scientists from VNIRO (Russia) and IMR (Norway) (Howell et al., 2024). This advice has been conducted outside ICES and should not be considered as ICES advice. However, the assessment has been produced following the methodology agreed at the ICES benchmark in 2023 (ICES, 2023).

Higher bycatch rates of Greenland halibut recently observed in the Norwegian cod and haddock fisheries may be partly to do with shifting distribution of those fisheries rather than Greenland halibut stock trends. Catch per unit of effort of the Russian target Greenland halibut fishery along the continental slope and bycatches in the Barents Sea do not show obvious downward trends during the last decade.

Greenland halibut is a long-lived species which requires low fishing pressure – the stock is currently declining and has dropped below  $B_{pa}$ . Due to the long lifespan and the key survey being run every second year, the advice is given on a two-year basis.

The Greenland halibut population extends past the Joint Norwegian Russian Fisheries Commission (JNRFC) domain and surveys considered in the assessment do not cover the entire distribution.

Note that the advice presented here covers the JNRFC managed area as well as international waters in the Barents Sea and British waters in ICES area 2. Therefore, the advice presented here covers all those catches.

## Reference points

Table 5. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY	19 142 tonnes	Maximum sustainable yield (long term)	(ICES, 2023; Howell et al. 2023)
	$HR_{MSY}$	0.139	HR ( $\geq 45\text{cm}$ ) leading to MSY	(ICES, 2023); Howell et al. 2023)
Precautionary approach	$B_{lim}$	33 391 tonnes	Lowest modelled mature female sub-stock biomass	(ICES, 2023; Howell et al. 2023)
	$B_{pa}$	46 747 tonnes	$B_{lim} \times 1.4$ (female SSB)	(ICES, 2023; Howell et al. 2023)
	$B_{trigger}$	46 747 tonnes	$B_{pa}$ (female SSB)	(ICES, 2023; Howell et al. 2023)
	$HR_{lim}$	0.165	HR ( $\geq 45\text{cm}$ ) leading to $P(SSB < B_{lim}) = 0.5$	(ICES, 2023; Howell et al. 2023)
	$HR_{pa}$	0.145	HR ( $\geq 45\text{cm}$ ), when the ICES Advice Rule is applied, leading to $P(SSB < B_{lim}) = 0.05$	(ICES, 2023; Howell et al. 2023)

## Basis of the assessment

Table 6. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Basis of the assessment and advice.

ICES stock data category	1
Assessment type	Age-length-structured (Gadget model).

<b>Input data</b>	Trends in biomass for five survey indices from three surveys: the Norwegian slope survey (G1165), the Russian autumn bottom trawl survey at the slope (G5348), and three survey indices from the Ecosystem survey (10-17 cm, 18-27 cm and 28-65 cm). Length distributions from these three surveys and from the Joint winter survey (A6996) and the Norwegian slope survey in spring (G5678); catch-in-tonnes from five aggregated commercial fleets (Russian, trawl and minor gears; Russian, gillnet and longline; Norwegian, trawl and minor gears; Norwegian, gillnet and longline; 3rd countries); age and maturity-at-length data from the Norwegian slope survey (G1165).
<b>Discards and bycatch</b>	Not included, considered negligible.
<b>Other information</b>	Last assessment update from ICES benchmark in February 2023 (ICES, 2023) used by JRN-AFWG 2023.
<b>Working group</b>	Joint Russian-Norwegian working group on Arctic Fisheries (JRN-AFWG).

## History of the advice, catch, and management

Table 7. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). ICES advice, agreed TACs, and ICES catches. All weights are in tonnes.

Year	ICES advice	Predicted catch corresponding to advice	Agreed TAC – Norway/JNRFC	TAC to Norway–UK/EU zone <sup>^</sup> in ICES subareas 2 and 6 combined <sup>^^</sup>	ICES catches
1987	Precautionary TAC	-	-		18 744
1988	No decrease in SSB	19 000	-		19 322
1989	F = F(87); TAC	21 000	-		18 353
1990	F = F(8 9 ); TAC	15 000	-		22 555
1991	F at Fmed; TAC; improved expl. pattern	9 000	-		33 318
1992	2 Rebuild SSB(1991)	6 000	7 000*		8 603
1993	TAC	7 000	7 000*		11 932
1994	F<0.1	<12 000	11 000*		9 226
1995	No fishing	0	2 500**		11 734
1996	No fishing	0	2 500**		14 347
1997	No fishing	0	2 500**		9 410
1998	No fishing	0	2 500**		11 893
1999	No fishing	0	2 500**		19 517
2000	No fishing	0	2 500**		14 297
2001	Reduce catch to rebuild stock	<11 000	2 500**		16 374
2002	Reduce F substantially	<11 000	2 500**		13 293
2003	Reduce catch to increase stock	<13 000	2 500**		13 446
2004	Do not exceed recent low catches	<13 000	2 500**		18 900
2005	Do not exceed recent low catches	<13 000	2 500**		18 834
2006	Do not exceed recent low catches	<13 000	2 500**		17 876



Year	ICES advice	Predicted catch corresponding to advice	Agreed TAC – Norway/JNRFC	TAC to Norway–UK/EU zone <sup>^</sup> in ICES subareas 2 and 6 combined <sup>^^</sup>	ICES catches
2007	Reduce catch to increase stock	<13 000	2 500**		15 458
2008	Reduce catch to increase stock	<13 000	2 500**		13 809
2009	Same advice as previous year	<13 000	2 500**		12 982
2010	Same advice as previous year	<13 000	15 000***	350	15 235
2011	Same advice as previous year	<13 000	15 000***	350	16 684
2012	No increase in catches	<15 000	18 000***	350	20 284
2013	No increase in catches	<15 000	18 000***	824	21 980
2014	No new advice, same as for 2013	<15 000	18 000***	1000	22 611
2015	Same as for 2014	<15 000	18 000***	1000	25 081
2016	Precautionary approach	<19 800	22 000***	1100	25 385
2017	Same advice as previous year	<19 800	24 000***	1100	26 437
2018	Precautionary approach	<23 000	27 000***	1100	28 600
2019	Same advice as previous year	<23 000	27 000***	1250	28 823
2020	Precautionary approach	<23 000	27 000***	1250	28 572
2021	Same advice as previous year	<23 000	27 000***	0	28 216
2022	Precautionary approach	≤ 19 094	25 000***	600	27 655
2023	Precautionary approach	≤ 18 494	25 000***	700	26 931
2024	MSY approach <sup>^^</sup>	≤ 15 560	21 250***	600	
2025	MSY approach <sup>^^</sup>	≤ 12 431			
2026	MSY approach <sup>^^</sup>	≤ 14 891			

\* Set by Norwegian authorities.

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

\*\*\* Set by the Joint Norwegian-Russian Fisheries Commission (JNRFC).

<sup>^</sup> UK after 2020.

<sup>^^</sup> Part of this TAC is taken in the assessment area.

^^ In 2023 and 2024 the assessment and the advice were carried out by the Joint Russian-Norwegian working group on Arctic fisheries (JRN-AFWG) which compiled catches for 2021-2023 and gave advice for 2023-2026.

## History of catch and landings

Table 8. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). History of commercial landings by country. All weights are in tonnes.

Year	Denmark	Estonia	Faroe Islands	Germany	France	Greenland	Iceland	Ireland	Latvia	Lithuania	Norway	Poland	Portugal	Russia	Spain	United Kingdom	Total
1984	0	0	0	2 165	138	0	0	0	0	0	3 540	0	0	15 181	0	23	21 047
1985	0	0	0	4 000	239	0	0	0	0	0	5 287	0	0	10 237	0	5	19 768
1986	0	0	42	2 718	13	0	0	0	0	0	7 783	0	0	12 200	0	12	22 768
1987	0	0	0	2 024	13	0	0	0	0	0	6 893	0	0	9 733	0	81	18 744
1988	0	0	186	744	67	0	0	0	0	0	8 811	0	0	9 430	0	84	19 322
1989	0	0	67	600	31	0	0	0	0	0	8 837	0	0	8 812	0	6	18 353
1990	0	0	163	954	49	0	0	0	0	0	11 615	0	0	4 764	0	10	22 555
1991	11	2 564	314	101	119	0	0	0	0	0	27 585	0	0	2 490	132	2	33 318
1992	0	0	16	13	111	13	0	0	0	0	7 668	0	31	718	23	10	8 603
1993	2	0	61	22	80	8	56	0	0	30	10 379	0	43	1 235	0	16	11 932
1994	4	0	18	296	55	3	15	5	0	4	8 428	0	36	283	1	78	9 226
1995	0	0	12	35	174	12	25	2	0	0	9 368	0	84	794	1 106	122	11 734
1996	0	0	2	81	219	123	70	0	0	0	11 623	0	79	1 576	200	374	14 347

Year	Denmark	Estonia	Faroe Islands	Germany	France	Greenland	Iceland	Ireland	Latvia	Lithuania	Norway	Poland	Portugal	Russia	Spain	United Kingdom	Total
1997	0	0	27	56	253	0	62	2	0	0	7 661	12	50	1 038	157	92	9 410
1998	0	0	57	34	67	0	23	2	0	0	8 435	31	99	2 659	259	227	11 893
1999	0	0	94	34	0	38	7	2	0	0	15 004	8	49	3 823	319	139	19 517
2000	0	0	0	15	45	0	16	1	0	0	9 083	3	37	4 568	375	154	14 297
2001	0	0	0	58	122	0	18	1	0	0	10 896	2	35	4 694	418	130	16 374
2002	0	219	0	42	7	22	4	6	0	0	7 143	5	14	5 584	178	69	13 293
2003	0	0	459	18	2	14	0	1	0	0	8 215	5	19	4 384	230	99	13 446
2004	0	0	0	9	0	0	10	0	0	0	13 939	1	50	4 662	186	43	18 900
2005	0	170	0	8	32	0	0	0	0	0	13 011	0	23	4 883	660	47	18 834
2006	0	0	204	8	46	0	8	0	0	196	11 118	201	26	6 055	2	12	17 876
2007	0	0	203	8	40	198	15	0	0	0	8 230	200	50	6 484	11	19	15 458
2008	0	0	663	5	41	0	28	0	0	0	7 393	201	46	5 294	112	26	13 809
2009	0	0	422	19	16	16	15	2	0	0	8 446	204	237	3 335	202	68	12 982
2010	0	0	272	14	102	15	16	0	0	0	7 700	3	11	6 888	188	26	15 235

Year	Denmark	Estonia	Faroe Islands	Germany	France	Greenland	Iceland	Ireland	Latvia	Lithuania	Norway	Poland	Portugal	Russia	Spain	United Kingdom	Total
2011	0	0	538	80	46	4	7	0	0	234	8 348	169	21	7 053	144	40	16 684
2012	0	0	563	40	40	12	13	0	0	0	9 331	22	1	10 041	186	35	20 284
2013	0	0	783	49	168	22	106	1	0	0	10 404	30	7	10 306	12	92	21 980
2014	0	0	887	33	269	24	86	0	0	0	10 997	19	0	10 061	23	212	22 611
2015	0	0	724	33	230	16	98	0	0	0	10 874	13	1	12 953	25	114	25 081
2016	2	353	1 078	9	229	18	75	0	0	0	12 932	26	19	10 561	27	56	25 385
2017	0	523	993	21	177	26	10	0	3	72	13 741	26	13	10 713	36	83	26 437
2018	2	574	401	50	150	20	24	0	0	206	14 875	27	6	12 071	60	134	28 600
2019	0	588	350	44	105	23	10	0	0	348	14 867	122	8	12 196	87	75	28 823
2020	1	579	514	73	39	48	19	0	0	261	14 526	97	9	12 265	96	45	28 572
2021	1	382	749	88	137	14	0	0	0	125	14 008	14	0	12 396	125	177	28 216
2022*	0	253	1 055	94	85	47	27	0	75	136	13 800	0	60	11 746	163	114	27 655
2023*	1	98	1 017	82	60	14	32	0	84	75	13 919	0	97	11 317	72	63	26 931

\*Provisional figures.

## Summary of the assessment

Table 9. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Assessment model summary.

Year	Recruitment (age 2)	Female SSB	Total Biomass	Biomass ( ≥45 cm )	Catches	Harvest rate
	Thousands	Tonnes				
1980	35 895	81 586	219 238	181 791	12 655	0.070
1981	37 050	73 723	216 067	178 241	14 466	0.081
1982	72 173	75 875	211 915	172 986	16 580	0.096
1983	8 242	75 664	205 884	165 889	21 773	0.131
1984	86 207	71 523	196 057	154 148	21 047	0.137
1985	22 201	66 968	187 790	143 719	19 768	0.138
1986	13 843	62 647	181 060	135 284	22 768	0.168
1987	80 378	56 705	172 248	125 386	18 744	0.149
1988	64 201	52 835	168 599	121 332	19 322	0.159
1989	51 049	48 931	165 604	117 639	18 353	0.156
1990	83 448	46 368	165 254	115 893	22 555	0.195
1991	66 130	42 146	162 459	109 314	33 318	0.305
1992	29 620	33 151	150 007	90 883	8 603	0.095
1993	40 229	35 514	162 728	99 101	11 932	0.120
1994	52 212	37 202	172 115	108 087	9 226	0.085
1995	59 613	40 936	184 117	122 102	11 734	0.096
1996	46 329	44 273	193 299	135 438	14 347	0.106
1997	35 737	47 425	199 176	146 155	9 410	0.064
1998	39 419	53 390	209 089	158 541	11 893	0.075
1999	50 467	58 752	215 645	165 171	19 517	0.118
2000	52 797	60 320	213 986	163 561	14 297	0.087
2001	52 051	64 079	217 178	167 825	16 374	0.098
2002	55 564	66 286	218 223	169 678	13 293	0.078
2003	76 701	69 571	222 851	172 790	13 446	0.078
2004	82 649	72 330	228 419	174 390	18 900	0.108
2005	81 080	71 875	230 121	170 894	18 834	0.110
2006	70 707	71 076	233 482	168 643	17 876	0.106
2007	67 231	70 827	239 157	168 522	15 458	0.092
2008	57 954	72 109	247 942	172 319	13 809	0.080
2009	54 996	74 628	258 557	180 665	12 982	0.072
2010	46 952	77 749	269 562	193 176	15 235	0.079
2011	43 941	80 638	277 260	205 398	16 684	0.081
2012	44 675	83 774	282 165	216 095	20 284	0.094

Year	Recruitment (age 2)	Female SSB	Total Biomass	Biomass ( ≥45 cm )	Catches	Harvest rate
	Thousands	Tonnes				
2013	43 353	85 867	281 969	221 658	21 980	0.099
2014	39 358	87 434	278 503	223 275	22 611	0.101
2015	41 993	88 581	273 014	221 870	25 081	0.113
2016	31 983	88 260	263 672	215 643	25 385	0.118
2017	29 363	86 822	252 705	207 095	26 437	0.128
2018	34 120	83 989	239 555	196 170	28 600	0.146
2019	87 254	79 042	224 418	182 286	28 823	0.158
2020	121 739	72 934	211 093	167 595	28 572	0.170
2021	36 906	66 116	199 934	152 589	28 216	0.185
2022	19 152	58 729	190 316	137 055	27 655	0.202
2023	44 241	51 351	182 706	121 421	26 931	0.222
2024		44 188	175 847	108 473		

## References

- Howell, D., Bogstad, B., Chetyrkin, A., Fall, J., Filin, A., Hallfredsson, E. H., et al. (2023). Report of the Joint Russian-Norwegian Working Group on Arctic Fisheries (JRN-AFWG) 2023. IMR-PINRO 2023-7 Available at: <https://www.hi.no/hi/nettrapporter/imr-pinro-en-2023-7>.
- Howell et al. 2024. Report of the Joint Russian-Norwegian Working Group on Arctic Fisheries (JRN-AFWG). IMR PINRO 2024-7. <https://www.hi.no/hi/nettrapporter/imr-pinro-en-2024-7>
- ICES (2023). Benchmark workshop on Greenland halibut and redfish stocks (WKBNORTH). ICES Scientific Reports doi:[10.17895/ICES.PUB.22304638.V1](https://doi.org/10.17895/ICES.PUB.22304638.V1).



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