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JOINT



Advice on fishing opportunities  
for Greenland halibut in 2024 in  
ICES subareas 1 and 2

REPORT

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

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

## Advice on fishing opportunities

The Joint Russian-Norwegian Arctic Fisheries Working Group (JRN-AFWG) advises that when the MSY approach is applied, catches in 2024 should be no more than 15 560 tonnes.

## Stock development over time

The female spawning stock biomass is slightly above  $B_{pa}$ , above  $B_{lim}$ , and declining. Total harvestable biomass ( $\geq 45$  cm) is in a rapid decline. Harvest rate is increasing and is now above  $HR_{MSY}$ .

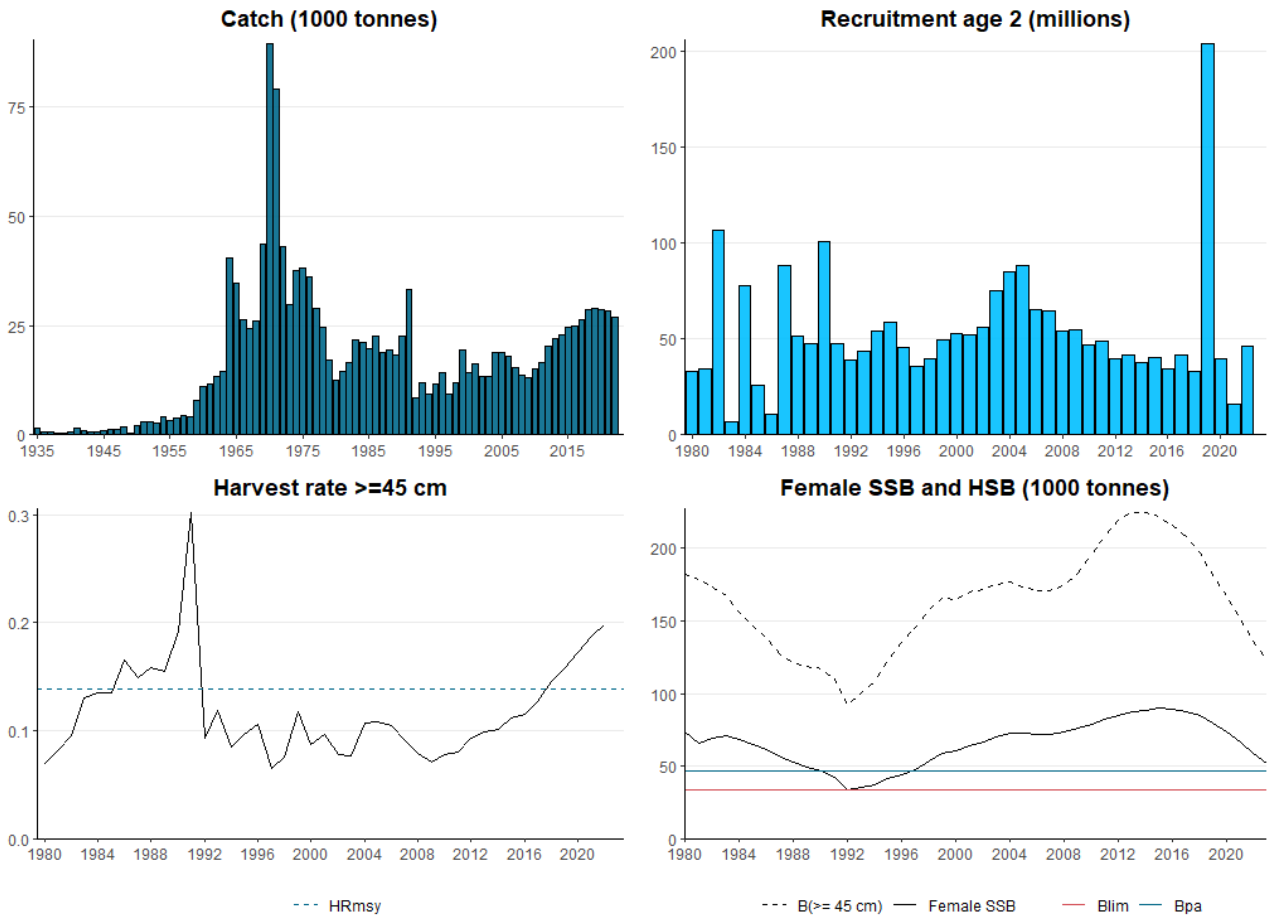


Figure 1 Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). From top left to bottom right: Catches, recruitment at age 2, harvest rate for fish  $\geq 45$  cm with estimated  $HR_{MSY}$ , and female SSB as well as HSB (harvestable stock biomass defined as  $\geq 45$  cm fish). The biomass reference points relate to female SSB. Note that the recruitment spike in 2019 is uncertain.

## Catch scenarios

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

Variable	Value	Notes
Harvest rate $\geq$ 45 cm (2023)	0.220	Based on expected catch in 2023
Biomass $\geq$ 45 cm (2024)	115 970	Beginning of 2024
Female SSB (2024)	45 379	Beginning of 2024
Recruitment age 1 (2023-2024)	50 928	Average 1990-2017. Does not influence short-term forecast
Expected catch (2023)	26 998	Based on status quo catch in 202 3 tonnes

Table 2. Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Annual catch scenarios for 2024. All weights are in tonnes.  $H$  arvest rate (HR) for  $\geq$  45 cm fish, female spawning stock biomass (SSB) in the beginning of 2025.

Basis	Total catch (2024)	HR (2024)	Female SSB (2025)	% Female SSB change *	% TAC change **	% Advice change ***
Advice basis						
MSY approach: $HR_{MSY} \times SSB_{2024/B}$ trigger	15 560	0.134	46 054	1.5	-37.8	-15.9
Other scenarios						
MSY approach ex. 2019 recruitment spike	14 012	0.129	43 282	-1.2	-44.0	-24.2
HR=0	0	0	53 142	14.6	-100.0	-100.0
Catch s.q.	26 997	0.233	40 844	-11.1	8.0	46.0

\* Female SSB 2025 relative to 2024. Note that the comparisons are within each scenario.

\*\* Advice for 2024 relative to the TAC in 2023 (25 000 tonnes).

\*\*\* Advice for 202 4 relative to the advice for 202 3 (18 494 tonnes).

The advice for 2024 is lower than the advice for 2023 mainly due to recent below average recruitment and high fishing pressure resulting in decreasing stock size.

## Basis of the advice

Table 3 Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). The basis of the advice.

Advice basis	MSY approach
Management plan	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 HR, 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 previous 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, while in the present model they are probably underestimated. There is evidence for a good recruitment event in 2019. However, the magnitude of this recruitment spike is currently poorly constrained by the data and should be considered uncertain.

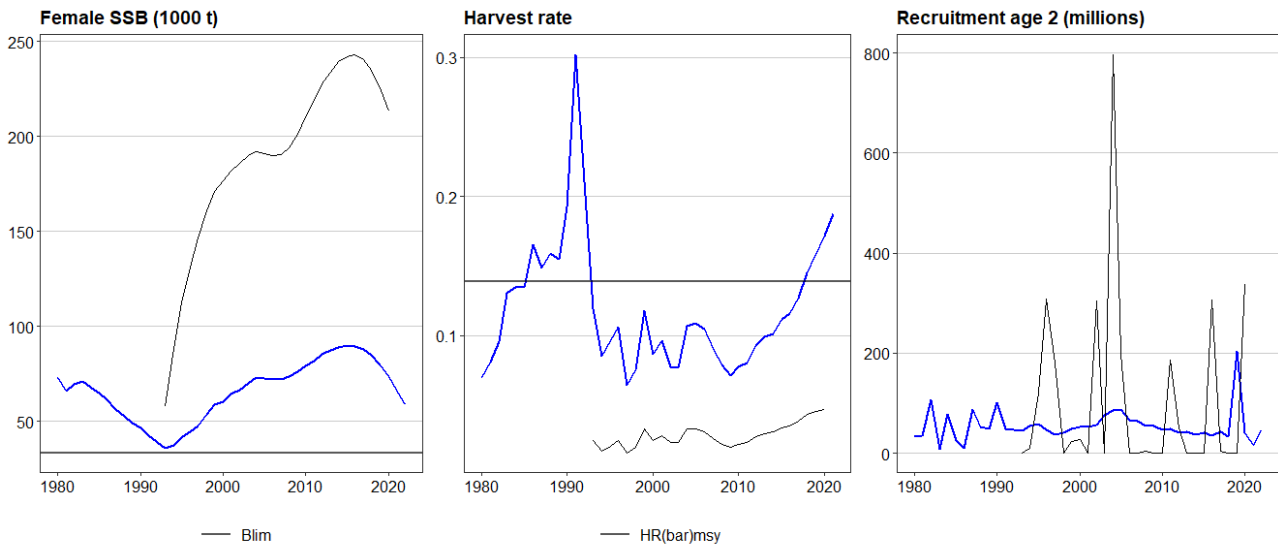


Figure 2 Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Historical assessment results. Black lines; 2021 assessment. Blue lines; 2023 assessment. Reference points refer to the 2023 assessment only.

## 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., 2023).

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).

The fishery has a history of both quotas being set at levels above those provided in scientific advice and catches being above the quota; this is not precautionary.

Greenland halibut is a long-lived species which requires low fishing pressure – and the stock is currently declining .

The Greenland halibut advice is for one year to bring the timing back in line with the slope survey, which is conducted biennially, after this the two-year advice cycle will be resumed.

## Reference points

Table 4 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)	
	HR <sub>MSY</sub>	0.139	HR (≥45cm) leading to MSY	

Framework	Reference point	Value	Technical basis	Source
Precautionary approach	$B_{lim}$	33 391 tonnes	Lowest modelled female SSB	Howell et al., 2023
	$B_{pa}$	46 747 tonnes	$B_{lim} \times 1.4$ (female SSB)	
	$B_{trigger}$	46 747 tonnes	$B_{pa}$ (female SSB)	
	$HR_{lim}$	0.165	HR ( $\geq 45$ cm) leading to $P(\text{female SSB} < B_{lim}) = 0.5$	
	$HR_{pa}$	0.145	HR ( $\geq 45$ cm), when ICES AR is applied, leading to $P(\text{female SSB} < B_{lim}) = 0.05$	

## Basis of the assessment

Table 5 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).
Input data	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 (10-17cm, 18-27cm and 28-65cm). 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; 3 <sup>rd</sup> countries); age and maturity-at-length data from the Norwegian slope survey (G1165).
Discards and bycatch	Not included, considered negligible.
Other information	Last assessment update from ICES benchmark in February 2023 (ICES, 2023) used by JRN-AFWG 2023.
Working group	Joint Russian-Norwegian Arctic Fisheries Working Group (JRN-AFWG).

## History of the advice, catch, and management

Table 6 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/JNRF	TAC to Norway–UK/EU zone <sup>^</sup> in ICES subareas 2 and 6 combined <sup>^^</sup>	ICES catches
1987	Precautionary TAC	-	-	-	19112
1988	No decrease in SSB	19000	-	-	19587
1989	$F = F(87)$ ; TAC	21000	-	-	20138
1990	$F = F(89)$ ; TAC	15000	-	-	23183
1991	$F$ at $F_{med}$ ; TAC; improved expl. pattern	9000	-	-	33320
1992	2 Rebuild SSB(1991)	6000	7000*	-	8602
1993	TAC	7000	7000*	-	11933

Year	ICES advice	Predicted catch corresponding to advice	Agreed TAC – Norway/JNRF	TAC to Norway–UK/EU zone <sup>^</sup> in ICES subareas 2 and 6 combined <sup>^^</sup>	ICES catches
1994	F<0.1	<12000	11000*		9226
1995	No fishing	0	2500**		11734
1996	No fishing	0	2500**		14347
1997	No fishing	0	2500**		9410
1998	No fishing	0	2500**		11893
1999	No fishing	0	2500**		19517
2000	No fishing	0	2500**		14297
2001	Reduce catch to rebuild stock	<11000	2500**		16365
2002	Reduce F substantially	<11000	2500**		13293
2003	Reduce catch to increase stock	<13000	2500**		13447
2004	Do not exceed recent low catches	<13000	2500**		18899
2005	Do not exceed recent low catches	<13000	2500**		18834
2006	Do not exceed recent low catches	<13000	2500**		17871
2007	Reduce catch to increase stock	<13000	2500**		15452
2008	Reduce catch to increase stock	<13000	2500**		13806
2009	Same advice as previous year	<13000	2500**		12979
2010	Same advice as previous year	<13000	15000***	350	8302
2011	Same advice as previous year	<13000	15000***	350	16605
2012	No increase in catches	<15000	18000***	350	20277
2013	No increase in catches	<15000	18000***	824	21977
2014	No new advice, same as for 2013	<15000	18000***	1000	22840
2015	Same as for 2014	<15000	18000***	1000	25069
2016	Precautionary approach	<19000	22000***	1100	25389
2017	Same advice as previous year	<19800	24000***	1100	26430
2018	Precautionary approach	<23000	27000***	1100	28587
2019	Same advice as previous year	<23000	27000***	1250	28792



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
2020	Precautionary approach	<23000	27000 <sup>***</sup>	1250	28566
2021	Same advice as previous year	<23000	27000 <sup>***</sup>	0	28440
2022	Precautionary approach	≤ 19094	25000 <sup>***</sup>	600	26997
2023	Precautionary approach	≤ 18494	25000 <sup>***</sup>	700	
2024	MSY approach <sup>^^^</sup>	≤ 15560			

\* 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.

<sup>^^^</sup> In 2023 assessment and advice was carried out by the Joint Russian-Norwegian working group on Arctic Fisheries (JRN-AFWG) which compiled catches for 2022 and gave advice for 2024.

## History of catch and landings

Table 7. 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	France	Germany	Greenland	Iceland	Ireland	Latvia	Lithuania	Norway	Poland	Po
1984	0	0	0	138	2165	0	0	0	0	0	4376	0	
1985	0	0	0	239	4000	0	0	0	0	0	5464	0	
1986	0	0	42	13	2718	0	0	0	0	0	7890	0	
1987	0	0	0	13	2024	0	0	0	0	0	7261	0	
1988	0	0	186	67	744	0	0	0	0	0	9076	0	
1989	0	0	67	31	600	0	0	0	0	0	10622	0	
1990	0	0	163	49	954	0	0	0	0	0	17243	0	
1991	11	2564	314	119	101	0	0	0	0	0	27587	0	
1992	0	0	16	111	13	13	0	0	0	0	7667	0	
1993	2	0	61	80	22	8	56	0	0	30	10380	0	
1994	4	0	18	55	296	3	15	5	0	4	8428	0	
1995	0	0	12	174	35	12	25	2	0	0	9368	0	
1996	0	0	2	219	81	123	70	0	0	0	11623	0	
1997	0	0	27	253	56	0	62	2	0	0	7661	12	
1998	0	0	57	67	34	0	23	2	0	0	8435	31	
1999	0	0	94	0	34	38	7	2	0	0	15004	8	
2000	0	0	0	45	15	0	16	1	0	0	9083	3	

Year	Denmark	Estonia	Faroe Islands	France	Germany	Greenland	Iceland	Ireland	Latvia	Lithuania	Norway	Poland	Po
2001	0	0	0	122	58	0	9	1	0	0	10896	2	
2002	0	219	0	7	42	22	4	6	0	0	7143	5	
2003	0	0	459	2	18	14	0	1	0	0	8216	5	
2004	0	0	0	0	9	0	9	0	0	0	13939	1	
2005	0	170	0	32	8	0	0	0	0	0	13011	0	
2006	0	0	204	44	7	0	7	0	0	196	11119	201	
2007	0	0	203	39	6	198	15	0	0	0	8230	200	
2008	0	0	663	40	4	0	28	0	0	0	7393	200	
2009	0	0	422	16	19	16	15	1	0	0	8446	203	
2010	0	0	272	102	14	15	15	0	0	0	770	2	
2011	0	0	538	46	80	4	7	0	0	234	8270	169	
2012	0	0	563	39	38	12	13	0	0	0	9331	21	
2013	0	0	783	167	48	22	106	0	0	0	10403	29	
2014	0	0	887	268	33	24	86	0	0	0	11232	17	
2015	0	0	721	228	30	16	98	0	0	0	10874	13	
2016	2	353	1076	226	8	17	75	0	0	0	12932	26	
2017	0	523	993	175	21	25	10	0	3	72	13741	25	
2018	2	574	400	148	50	19	24	0	0	204	14874	25	
2019	0	587	350	103	44	21	8	0	0	347	14845	122	
2020	1	579	512	37	70	47	19	0	0	260	14532	96	
2021	1	382	756	138	88	14	40	0	96	160	14008	15	
2022*	0	253	1055	85	94	48	27	0	75	136	13140	0	

\*Provisional figures.

## Summary of the assessment

Table 8 Greenland halibut in ICES subareas 1 and 2 (Northeast Arctic). Assessment summary.

Year	Recruitment (age 2)	Female SSB	Total Biomass	Biomass ( ≥45 cm )	Catches	Harvest rate
	Thousands	Tonnes				
1980	33174	73170	220981	181796	12655	0.070
1981	34503	65655	217738	178563	14466	0.081
1982	106502	69517	213525	173776	16580	0.095
1983	6949	70809	207467	167291	21773	0.130
1984	77582	68086	197564	156330	21047	0.135
1985	26066	64679	189247	146627	19768	0.135
1986	10574	61248	182387	137757	22768	0.165

Year	Recruitment (age 2)	Female SSB	Total Biomass	Biomass ( ≥45 cm )	Catches	Harvest rate
	Thousands	Tonnes				
1987	88075	55995	173540	126210	18744	0.149
1988	51569	52502	169723	121542	19322	0.159
1989	47586	48823	166389	118591	18352	0.155
1990	100647	46374	165870	117172	22555	0.192
1991	47861	42255	162749	110325	33318	0.302
1992	38788	33391	150062	91896	8603	0.094
1993	43924	35742	162661	100195	11932	0.119
1994	54266	37418	172100	108567	9226	0.085
1995	58792	41108	184287	121926	11734	0.096
1996	45754	44393	193735	135182	14347	0.106
1997	35962	47478	199914	145687	9410	0.065
1998	39999	53363	210132	158025	11893	0.075
1999	49363	58678	216955	165340	19517	0.118
2000	52648	60291	215514	164692	14297	0.087
2001	51887	64141	218870	169567	16365	0.097
2002	56021	66519	220046	171637	13293	0.077
2003	74955	69992	224730	174848	13446	0.077
2004	84718	72954	230346	176571	18899	0.107
2005	88078	72708	232233	173122	18834	0.109
2006	65148	72076	235773	170790	17871	0.105
2007	64334	71920	241567	170590	15453	0.091
2008	53810	73262	250343	174408	13792	0.079
2009	54759	75823	260794	182825	12991	0.071
2010	46942	78980	271488	195636	15299	0.078
2011	49075	81917	278904	208394	16684	0.080
2012	39800	85095	283502	219252	20288	0.093
2013	41745	87218	282950	224230	21164	0.099
2014	37664	88688	278874	224648	22790	0.101
2015	40472	89658	272755	222186	24748	0.111
2016	34412	89310	263299	215866	24933	0.116
2017	41795	87870	252630	207762	26379	0.127
2018	33000	84841	239640	196756	2858 8	0.145
2019	203650	79673	227113	182369	28844	0.158
2020	39757	73337	216885	166990	28705	0.172
2021	16048	66288	208581	151381	28443	0.188

Year	Recruitment (age 2)	Female SSB	Total Biomass	Biomass ( ≥45 cm )	Catches	Harvest rate
	Thousands	Tonnes				
2022	46353	58745	201555	135955	26998	0.199
2023		51872	200050	122949		

## References

Howell et al. 2023. [Report of the Joint Russian-Norwegian Working Group on Arctic Fisheries \(JRN-AFWG\) 2023](#). IMR-PINRO no.7-2023.

ICES. 2023. Benchmark workshop on Greenland halibut and redfish stocks (WKBNORTH). ICES Scientific Reports. 5:33. <https://doi.org/10.17895/ices.pub.22304638>



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