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Commercial pelagic fish

Pre-released contribution to the scientific report from the Norwegian and Russian Barents Sea ecosystem surveys in August-October 2024 (BESS)

Edited by
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7 - COMMERCIAL PELAGIC FISH

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7.1 Capelin (*Mallotus villosus*)

The coverage of the capelin distribution was synoptic with very high effort allocated to the important bank areas. The capelin coverage was considered to be close to complete for 2024 (see Figure 7.1.1.1), even though the south-western part of the shelf west of Svalbard (Spitsbergen) was not covered. This west shelf is normally not an area with important amounts of capelin. A summary of the capelin stock assessment for 2024 is given in Barents Sea capelin advice sheet 2024 with more details provided in Barents Sea capelin assessment report 2024.

7.1.1 Geographical distribution

The geographical distribution of capelin recorded acoustically is shown in Figure 7.1.1.1. The capelin was distributed quite far north, but not as far north as in 2023 when the population size was much higher. The main distribution area was the Great Bank which is the normal core area at this time of the year. Some recordings were also made north of Svalbard (Spitsbergen) which was also observed in 2023.

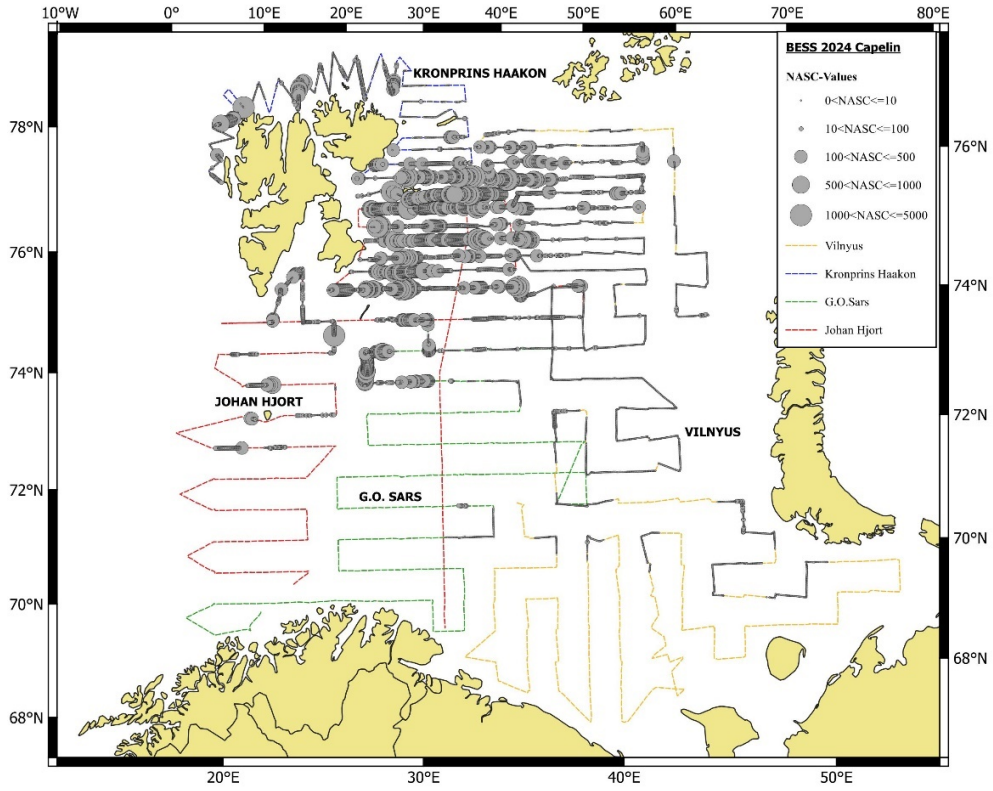

Figure. 7.1.1.1 Geographical distribution of capelin in autumn 2024 based on acoustic recordings. Circle sizes correspond to NASC values (m^2/nmi^2) per nautical mile.

7.1.2 Abundance by size and age

A detailed summary of the acoustic stock estimate is given in Table 7.1.2.1, and the time series of abundance estimates is summarized in Table 7.1.2.2. A comparison between the estimates in 2024 and 2023 is given in table 7.1.2.3 with the 2023 estimate shown on a shaded background.

The total stock in the covered area was estimated to about 887 thousand tons, which is only about a third of the long-term average level (2.79 million tons). About 60 % (534 thousand tons) of the 2024 stock had length above 14 cm and was therefore considered to be maturing. In terms of biomass, the contribution to the total was quite equal from both 1, 2, 3 and 4-year-olds (table 7.1.2.1). The abundance of 1 and 3 year-olds was less than a third of the long term average and 2-year-olds less than a sixth of the long term average. Only the abundance of 4-year-olds (2020-yearclass) and 5-year-olds (2019-yearclass) were stronger than the long-term average.

Average weight at age increased compared to 2023 for the age groups 2-4. For 3- and 4-year-olds it was still well below the long term average, whereas it was above the long term average for 1 and 2-year-olds (figure 7.1.2.1 and table 7.1.2.2).

Table 7.1.2.1. Barents Sea capelin. Summary of results from the acoustic estimate in August-September 2024. The table is generated from the mean of 1000 bootstrap replicates based on calculations in StoX 4.0. TSN: Total stock number. TSB: Total stock biomass. MSN: Maturing stock number. MSB: Maturing stock biomass.

Length (cm)	Age/year class						Sum (10^9)	Biomass (10^3 t)	Mean weight (g)
	1	2	3	4	5	6			
	2023	2022	2021	2020	2019	2018			
6.5-7.0	0.434						0.434	0.099	1.25
7.0-7.5	2.008						2.008	2.131	1.26
7.5-8.0	4.859						4.859	7.281	1.74
8.0-8.5	5.469						5.469	9.720	2.11
8.5-9.0	8.887						8.887	19.094	2.54
9.0-9.5	7.793						7.793	20.755	3.11
9.5-10.0	8.836						8.837	27.217	3.64
10.0-10.5	7.589	0.052					7.641	32.441	4.33
10.5-11.0	5.493	0.086					5.578	27.135	4.89
11.0-11.5	3.902	0.117					4.019	22.483	5.70
11.5-12.0	2.241	0.793					3.034	20.655	6.87
12.0-12.5	0.390	1.407	0.051				1.848	14.581	7.94
12.5-13.0	0.599	2.671	0.066				3.336	29.409	8.90
13.0-13.5	0.058	4.534	0.346	0.127			5.066	52.743	10.37
13.5-14.0		3.947	1.255	0.527			5.729	67.374	11.74
14.0-14.5		2.136	1.896	0.828	0.211		5.071	66.915	13.24
14.5-15.0		2.067	2.725	2.205	0.091		7.089	105.034	14.85
15.0-15.5		1.218	3.310	2.210	0.342	0.023	7.103	119.925	16.83
15.5-16.0		0.515	1.638	1.575	0.161		3.889	74.262	19.29
16.0-16.5		0.207	1.233	1.179	0.391		3.010	62.802	20.99
16.5-17.0		0.066	0.421	1.041	0.090	0.001	1.618	40.243	24.91
17.0-17.5		0.022	0.281	0.744	0.158		1.205	33.617	27.84
17.5-18.0			0.172	0.396	0.069		0.637	19.946	31.48
18.0-18.5			0.040	0.232			0.272	9.444	35.45
18.5-19.0				0.019			0.019	0.730	39.00
19.0-19.5				0.002			0.002	0.047	31.00
19.5-20.0									
20.0-20.5					0.019		0.019	0.576	31.00

TSN (10^9)	58.560	19.837	13.434	11.084	1.534	0.024	104.473		
TSB (10^3 t)	190.690	233.120	220.203	212.774	29.479	0.395		886.661	
Mean length (cm)	9.55	13.47	14.85	15.37	15.52	15.75			
Mean weight (g)	3.96	11.90	16.19	18.97	18.04	20.33			8.49
SSN (10^9)		6.230	11.716	10.430	1.534	0.024	29.933		
SSB (10^3 t)		97.708	201.022	204.937	29.479	0.395		533.541	

Estimates based on Target strength (TS) Length (L) relationship : TS= 19.1 log (L) – 74.0

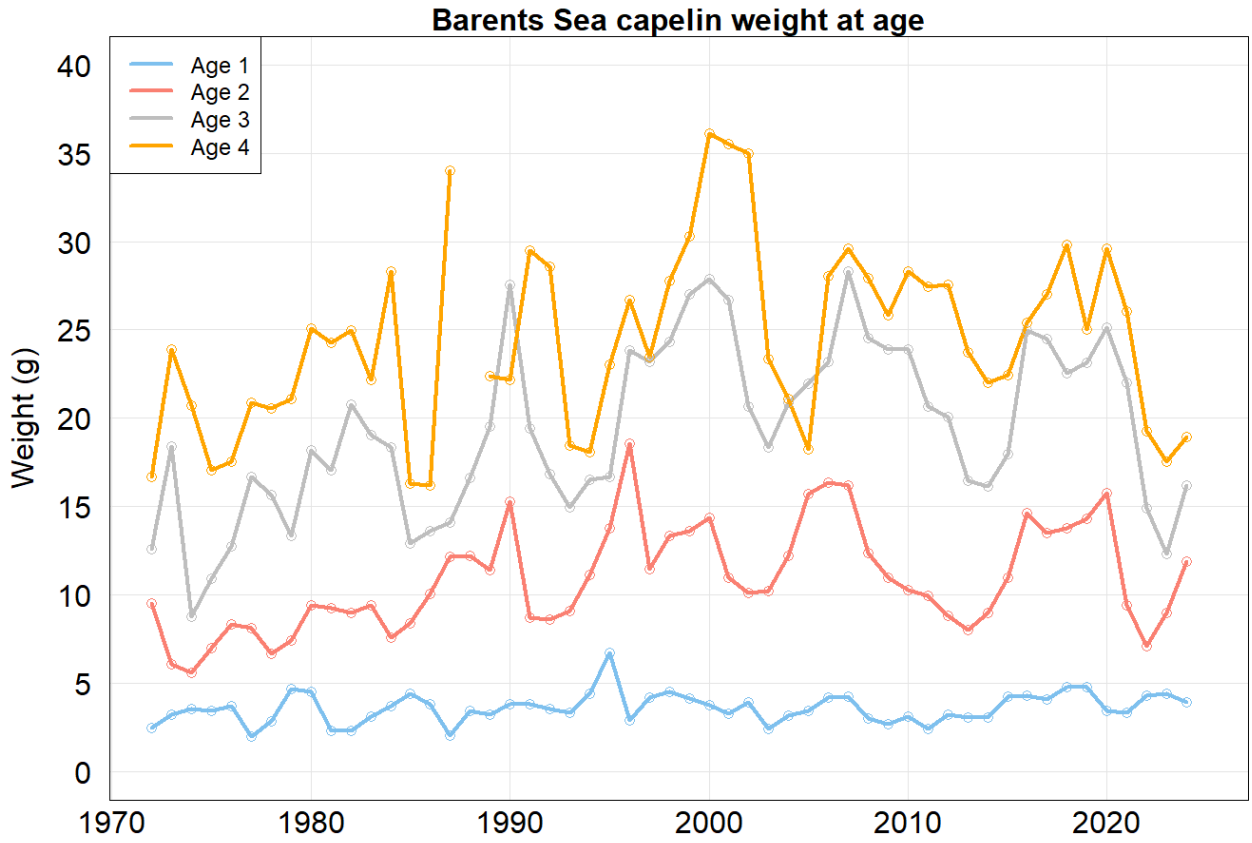

Figure 7.1.2.1. Weight at age for capelin from capelin surveys (prior to 2003) and BESS.

*Table 7.1.2.2. Barents Sea capelin. Summary of acoustic estimates by age in autumn 1973- 2024. Biomass (B) in tons *10^6 and average weight (AW) in grams. Note that the numbers for 2004-2022 were updated following the re-estimation in StoX for the capelin benchmark in 2022. The numbers are means from 1000 bootstrap replicates.*

Year	Age										Sum
	1		2		3		4		5		
	BM1	W1	BM2	W2	BM3	W3	BM4	W4	BM5	W5	TSB
1973	1.71	3.2	2.29	6.1	0.73	18.4	0.41	23.9	+	27.3	5.15
1974	1.08	3.6	3.06	5.6	1.52	8.8	0.07	20.7	+	25.1	5.74
1975	0.66	3.4	2.44	7.0	3.24	10.9	1.48	17.1	0.01	28.1	7.82
1976	0.79	3.7	1.95	8.4	2.08	12.8	1.34	17.5	0.26	21.3	6.42
1977	0.72	2.0	1.43	8.2	1.64	16.7	0.84	20.9	0.17	23.3	4.80
1978	0.24	2.9	2.62	6.7	1.19	15.7	0.18	20.6	0.02	25.7	4.25
1979	0.06	4.7	2.48	7.4	1.52	13.3	0.10	21.1	+	24.1	4.16
1980	1.22	4.5	1.84	9.4	2.82	18.2	0.83	25.1	0.01	21.8	6.72
1981	0.92	2.3	1.81	9.2	0.82	17.1	0.33	24.2	0.01	29.1	3.89
1982	1.22	2.3	1.33	9.0	1.18	20.8	0.05	25.0			3.78
1983	1.61	3.1	1.89	9.4	0.73	19.0	0.01	22.2			4.23
1984	0.57	3.7	1.42	7.6	0.89	18.4	0.09	28.3			2.96
1985	0.17	4.4	0.40	8.4	0.27	12.9	0.01	16.3			0.86
1986	0.02	3.8	0.05	10.1	0.05	13.6	+	16.2			0.12
1987	0.08	2.1	0.02	12.2	+	14.1	+	34.0			0.10
1988	0.07	3.4	0.35	12.2	+	16.6					0.43
1989	0.62	3.3	0.20	11.4	0.05	19.5	+	22.4			0.87
1990	2.67	3.8	2.71	15.3	0.45	27.6	+	22.2			5.84
1991	1.53	3.8	5.07	8.7	0.64	19.4	0.04	29.5			7.28
1992	1.25	3.6	1.70	8.6	2.17	16.8	0.04	28.6			5.16
1993	0.01	3.4	0.49	9.1	0.26	14.9	0.04	18.5			0.80
1994	0.09	4.4	0.04	11.1	0.07	16.5	+	18.1			0.20
1995	0.05	6.7	0.11	13.8	0.03	16.7	0.01	23.0			0.19
1996	0.24	2.9	0.21	18.6	0.05	23.8	+	26.7			0.50
1997	0.41	4.2	0.45	11.5	0.04	23.2	+	23.5			0.91
1998	0.81	4.5	0.97	13.3	0.26	24.3	0.02	27.8	+	29.9	2.05
1999	0.65	4.2	1.38	13.6	0.72	27.0	0.03	30.3			2.77
2000	1.71	3.8	1.59	14.3	0.95	27.9	0.03	36.1	+	20.1	4.27
2001	0.38	3.3	2.40	11.0	0.81	26.7	0.04	35.5	+	41.3	3.63
2002	0.23	3.9	0.92	10.1	1.04	20.7	0.02	35.0			2.21

Year	Age										Sum
	1		2		3		4		5		
	BM1	W1	BM2	W2	BM3	W3	BM4	W4	BM5	W5	TSB
2003	0.20	2.4	0.10	10.2	0.20	18.3	0.03	23.3			0.53
2004	0.20	3.2	0.21	12.2	0.09	20.9	0.01	21.1	+	25.4	0.51
2005	0.08	3.4	0.33	15.7	0.08	22.0	0.01	18.2	+	19.6	0.50
2006	0.24	4.2	0.27	16.4	0.12	23.2	+	28.0	+	25.4	0.64
2007	0.83	4.3	0.81	16.2	0.16	28.3	0.01	29.6			1.82
2008	0.89	3.0	2.46	12.4	0.59	24.6	0.01	27.9			3.95
2009	0.47	2.7	1.63	11.0	1.15	23.9	+	25.9			3.25
2010	0.76	3.1	1.41	10.3	1.60	23.9	0.05	28.3			3.82
2011	0.47	2.4	1.72	9.9	1.19	20.7	0.21	27.5			3.60
2012	0.57	3.2	1.03	8.8	1.77	20.1	0.08	27.5			3.46
2013	0.99	3.1	1.58	8.0	1.11	16.5	0.28	23.7	+	28.7	3.97
2014	0.32	3.1	0.73	9.0	0.60	16.1	0.04	22.0			1.69
2015	0.16	4.3	0.46	11.0	0.23	18.0	0.02	22.4			0.88
2016	0.14	4.3	0.12	14.6	0.06	24.9	+	25.4			0.32
2017	0.47	4.1	1.61	13.5	0.34	24.5	0.01	27.0			2.43
2018	0.28	4.8	0.84	13.8	0.51	22.6	0.01	29.8	+	34.0	1.64
2019	0.09	4.8	0.14	14.3	0.16	23.2	0.03	25.0	+	18.9	0.41
2020	1.27	3.4	0.49	15.8	0.10	25.1	0.02	29.6	+	23.3	1.89
2021	0.75	3.4	3.07	9.4	0.16	22.0	+	26.0			3.99
2022	0.32	4.3	0.96	7.1	0.86	14.9	0.02	19.2	+	24.0	2.17
2023	0.48	4.4	0.72	9.0	1.32	12.3	0.42	17.6	+	20.5	2.95
2024	0.19	4.0	0.23	11.9	0.22	16.2	0.21	19.0	0.03	18.0	0.89
Average	0.61	3.6	1.24	10.9	0.75	19.5	0.14	24.6	0.01	25.2	2.76

Note:«+» <0.005*10^6 tons

Table 7.1.2.3. Summary of acoustic stock size estimates for capelin. A comparison of the estimates in 2024 and 2023 (shaded background).

Year class		Age	Numbers (10^6)		Mean weight (g)		Biomass (10^3 t)	
2023	2022	1	58.6	108.5	3.96	4.43	190.7	480.6
2022	2021	2	19.8	80.3	11.90	9.01	233.1	723.4
2021	2020	3	13.4	107.4	16.19	12.33	220.2	1324.2
2020	2019	4	11.1	23.9	18.97	17.56	212.8	419.4
Total stock in:								
2024	2023	1-4	104.5	320.3	8.49	9.21	886.7	2951.7

7.2 Polar cod (*Boreogadus saida*)

7.2.1 Geographical distribution

The acoustic recordings of polar cod are shown in Figure 7.2.1.1. There were no areas with really high concentrations of polar cod, but the concentrations adjacent to the Great Bank dominated. Only small concentrations of polar cod were found to the south near the Kara Strait where huge concentrations were found in 2023. There were significant recordings of polar cod along the north-easternmost of transects which indicates that parts of the polar cod stock were distributed east and possibly north of the covered area.

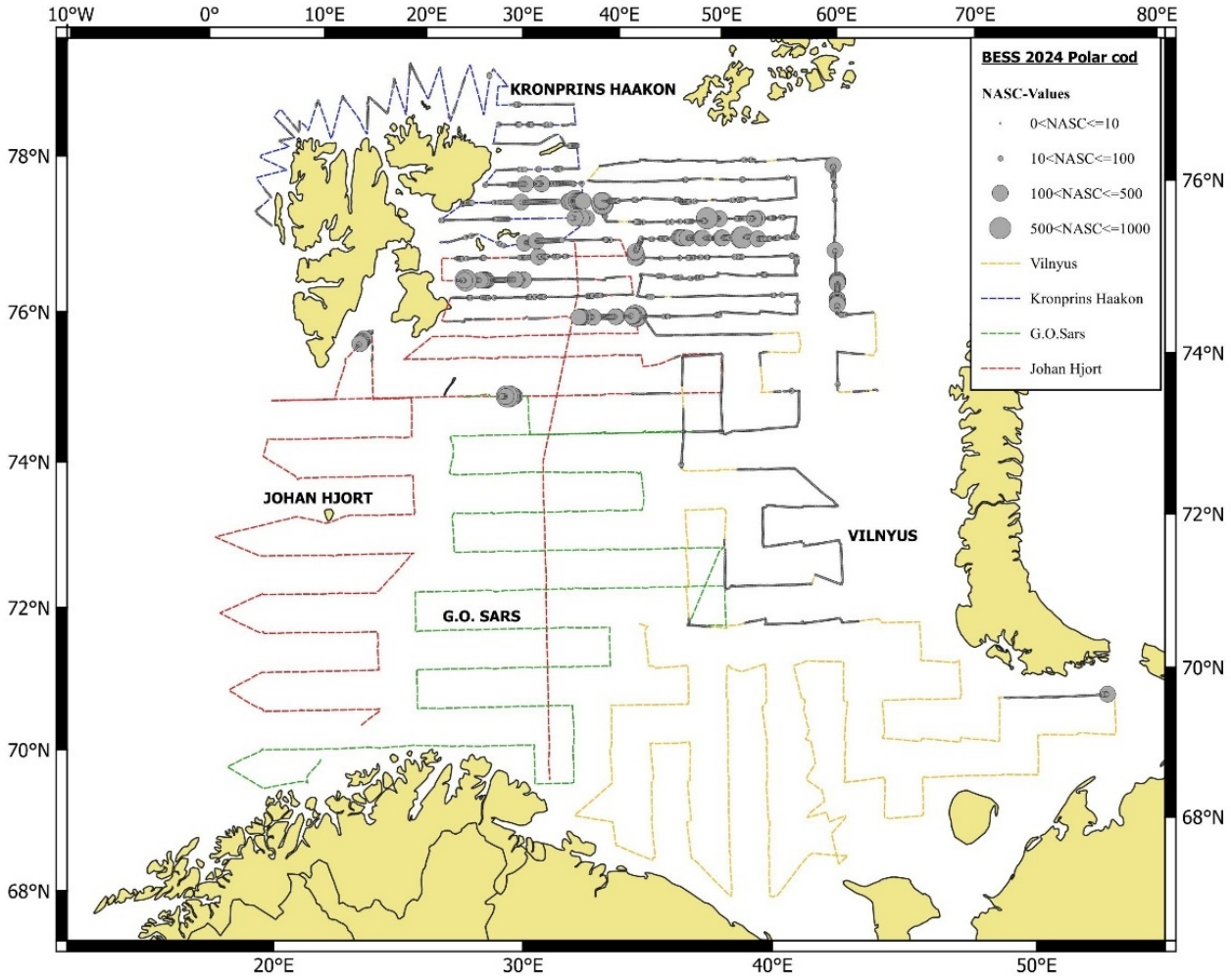

Figure 7.2.1.1 Geographical distribution of polar cod in autumn 2024 based on acoustic data. Circle sizes correspond to NASC values (m^2/nm^2) per nautical mile.

7.2.2. Abundance estimation

The stock abundance estimates of polar cod by age, number and weight in 2024 is given in Table 7.2.2.1 and the time series of abundance estimates is summarized in Table 7.2.2.2. The estimated means are from 500 bootstrap replicas made in StoX 4.1.1.

The total estimated abundance of polar cod in 2024 was low, less than 15% of the estimate from 2023. Age group 1 dominated the abundance while age group 2 dominated biomass, but the abundance of all age groups was well below the levels in 2023.

The north-east part of the Barents Sea where polar cod is often distributed has not been covered since 2020. There are also indications of a northwards distribution change in polar cod, so the survey results must be interpreted with caution. However, the estimates indicate that there has been a very strong dynamic in the Barents Sea polar cod stock abundance during the past decade, especially compared to the period 1991-2013.

Table 7.2.2.1. Barents Sea polar cod. Summary of results from the acoustic estimate in August- October 2024. All values in the table are derived from average number and biomass at length and age from 500 bootstrap runs in StoX 4.1.1.

Length (cm)	Age/year class						Sum (10^9)	Biomass (10^3 t)	Mean weight (g)
	1	2	3	4	5	6			
	2023	2022	2021	2020	2019	2018			
7.0-8.0	0.001						0.001	0.002	2.12
8.0-9.0	0.093						0.093	0.375	4.17
9.0-10.0	0.089						0.089	0.518	5.83
10.0-11.0	0.307	0.006					0.313	2.489	7.87
11.0-12.0	0.644	0.019					0.663	7.111	10.75
12.0-13.0	0.379	0.038	0.005				0.422	5.780	13.54
13.0-14.0	0.188	0.139	0.013	0.005			0.346	6.194	17.82
14.0-15.0	0.018	0.202	0.050	0.002	0.004		0.276	6.194	22.32
15.0-16.0	0.005	0.283	0.116	0.012	0.005		0.420	11.315	26.82
16.0-17.0		0.230	0.062	0.023	0.002		0.317	10.158	32.03
17.0-18.0		0.070	0.053	0.006	0.002		0.130	4.961	38.54
18.0-19.0		0.030	0.040	0.006			0.076	3.455	46.17
19.0-20.0		0.005	0.037	0.004			0.046	2.381	52.71
20.0-21.0			0.005	0.025			0.029	1.835	62.03
21.0-22.0			0.003	0.007	0.003		0.013	0.904	77.79
22.0-23.0				0.003	0.002		0.006	0.422	76.54
23.0-24.0						0.002	0.002	0.190	93.94
24.0-25.0				0.001			0.001	0.113	79.99
25.0-26.0				0.001			0.001	0.081	96.44
TSN (10^9)	1.725	1.022	0.383	0.096	0.018	0.002	3.252		
TSB (10^3 t)	19.243	26.961	12.923	4.392	0.767	0.190		64.668	
Mean length (cm)	11.13	14.88	16.09	17.93	17.59	23.00	13.79		
Mean weight (g)	11.32	26.71	34.67	47.19	46.12	91.80			23.06

Estimates based on Target strength (TS) Length (L) relationship : TS= 21.8 log (L) – 72.7

Table 7.2.2.2. Barents Sea polar cod. Summary of acoustic estimates by age in August-October 2024. TSN and TSB are total stock numbers (10^9) and total stock biomass (10^3 tons) respectively.

Year	Age 1		Age 2		Age 3		Age 4+		Total	
	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB
1986	24.038	169.6	6.263	104.3	1.058	31.5	0.082	3.4	31.441	308.8
1987	15.041	125.1	10.142	184.2	3.111	72.2	0.039	1.2	28.333	382.8
1988	4.314	37.1	1.469	27.1	0.727	20.1	0.052	1.7	6.562	86.0
1989	13.540	154.9	1.777	41.7	0.236	8.6	0.060	2.6	15.613	207.8
1990	3.834	39.3	2.221	56.8	0.650	25.3	0.094	6.9	6.799	127.3
1991	23.670	214.2	4.159	93.8	1.922	67.0	0.152	6.4	29.903	381.5
1992	22.902	194.4	13.992	376.5	0.832	20.9	0.064	2.9	37.790	594.9
1993	16.269	131.6	18.919	367.1	2.965	103.3	0.147	7.7	38.300	609.7
1994	27.466	189.7	9.297	161.0	5.044	154.0	0.790	35.8	42.597	540.5
1995	30.697	249.6	6.493	127.8	1.610	41.0	0.175	7.9	38.975	426.2
1996	19.438	144.9	10.056	230.6	3.287	103.1	0.212	8.0	33.012	487.4
1997	15.848	136.7	7.755	124.5	3.139	86.4	0.992	39.3	28.012	400.7
1998	89.947	505.5	7.634	174.5	3.965	119.3	0.598	23.0	102.435	839.5
1999	59.434	399.6	22.760	426.0	8.803	286.8	0.435	25.9	91.463	1141.9
2000	33.825	269.4	19.999	432.4	14.598	597.6	0.840	48.4	69.262	1347.8
2001	77.144	709.0	15.694	434.5	12.499	589.3	2.271	132.1	107.713	1869.6
2002	8.431	56.8	34.824	875.9	6.350	282.2	2.322	143.2	52.218	1377.2
2003*	32.804	242.7	3.255	59.9	15.374	481.2	1.739	87.6	53.172	871.4
2004	99.404	627.1	22.777	404.9	2.627	82.2	0.510	32.7	125.319	1143.8
2005	71.675	626.6	57.053	1028.2	3.703	120.2	0.407	28.3	132.859	1803.0
2006	16.190	180.8	45.063	1277.4	12.083	445.9	0.698	37.2	74.033	1941.2
2007	29.483	321.2	25.778	743.4	3.230	145.8	0.315	19.8	58.807	1230.1
2008	41.693	421.8	18.114	522.0	5.905	247.8	0.415	27.8	66.127	1219.4
2009	13.276	100.2	22.213	492.5	8.265	280.0	0.336	16.6	44.090	889.3
2010	27.285	234.2	18.257	543.1	12.982	594.6	1.253	58.6	59.777	1430.5
2011	34.460	282.3	14.455	304.4	4.728	237.1	0.514	36.7	54.158	860.5
2012	13.521	113.6	4.696	104.3	2.121	93.0	0.119	8.0	20.457	318.9
2013	2.216	18.1	4.317	102.2	5.243	210.3	0.180	9.9	11.956	340.5
2014	0.687	6.5	4.439	110.0	3.196	121.0	0.080	5.3	8.402	243.2
2015	10.866	97.1	1.995	45.1	0.167	5.3	0.008	0.5	13.036	148.0
2016	95.919	792.7	6.380	139.1	0.207	6.9	0.023	0.7	102.529	939.4
2017	13.810	121.8	8.269	200.8	1.112	34.3	0.003	0.1	23.195	357.1
2018**	1.900	16.4	0.980	23.1	0.240	9.4	0.014	0.6	3.124	49.6

Year	Age 1		Age 2		Age 3		Age 4+		Total	
	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB
2019**	6.109	49.8	1.217	30.3	0.214	6.3	0.014	0.8	7.555	87.2
2020	115.139	988.3	20.133	386.8	8.217	299.3	0.647	42.8	144.171	1720.8
2021**	45.340	375.5	44.020	819.9	2.190	90.4	0.210	13.3	91.760	1299.0
2022**	No data									
2023**	9.640	75.9	3.465	54.9	6.240	221.9	2.983	137.7	22.328	490.4
2024**	1.725	19.2	1.022	27.0	0.383	12.9	0.114	5.2	3.252	64.7
Average	30.760	248.4	13.720	306.8	4.450	167.2	0.520	28.1	49.490	752.0

* numbers partly based on VPA estimates

** incomplete survey coverage

7.3 Herring (*Clupea harengus*)

7.3.1 Geographical distribution

Young Norwegian spring spawning herring (NSSH) was distributed over large parts of the southern Barents Sea (Figure 7.3.1.1).

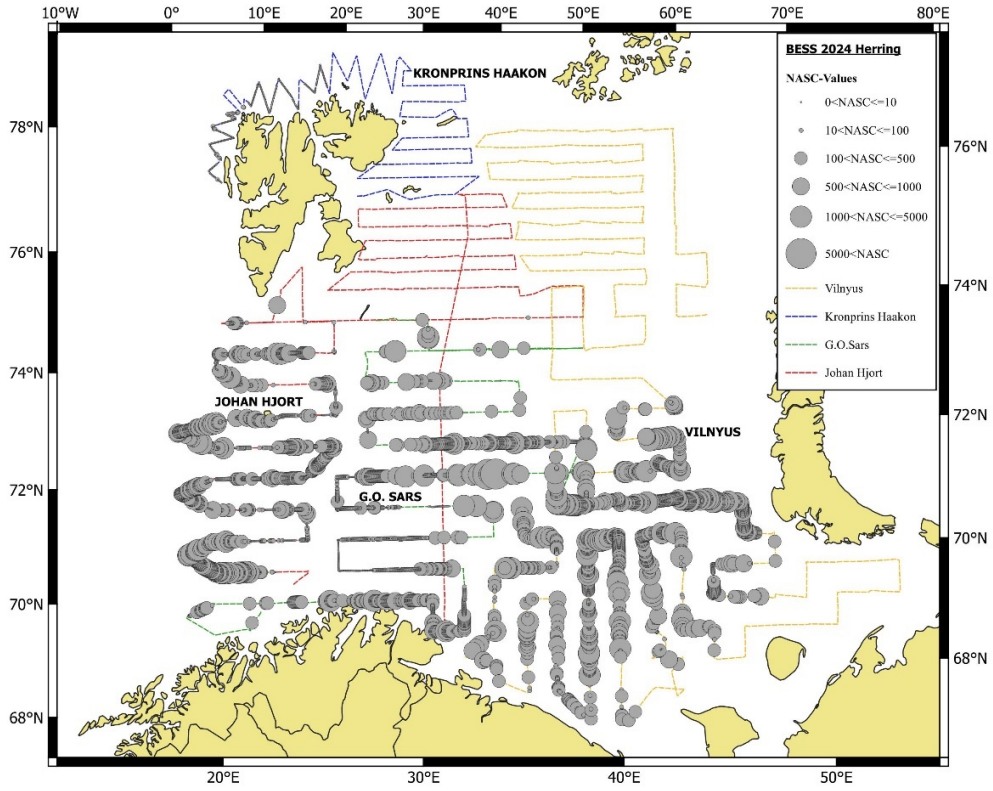

Figure 7.3.1.1 Geographical distribution of herring in autumn 2024 based on acoustic recordings. Circle sizes correspond to NASC values (m^2/nm^2) per nautical mile.

7.3.2 Abundance estimation

The estimated total number and biomass of NSSH in the Barents Sea in the autumn 2024 is shown in table 7.3.2.1, and the time series of abundance estimates is summarized in Table 7.3.2.2. Total numbers in 2024 was estimated at ca. 72 billion individuals (Table 7.3.2.1). This is the third highest on record and ca. 2.5 times higher than the long-term average (Table 7.3.2.2). Abundance of age group 1 was low, while abundance of age group 2 (2022 year class) was >5 times higher than the long-term average and abundance of age group 3 (2021 year class) was >6 times higher. The abundances of both 2 and 3-year-olds were the highest on record. Also abundance of age group 4+ was above the long-term average. The very high abundances of 2 and 3-year-olds were expected given the very high abundances of 1 and 2-year-olds in 2023. The total biomass of NSS-herring in the Barents Sea which is dominated by biomass of 2 and 3-year-olds is the highest that has been measured since 1999.

Table 7.3.2.1. NSSH. Acoustic estimate in the Barents Sea in August-October 2024 . All values in the table are derived from average number and biomass at length and age from 1000 bootstrap runs in StoX 4.0.

Length (cm)	Age/year class									Sum (10^9)	Biomass (10^3 t)	Mean weight (g)
	1	2	3	4	5	6	7	8	9			
	2023	2022	2021	2020	2019	2018	2017	2016	2015			
10.0-11.0	0.004									0.004	0.028	6.83
11.0-12.0	0.075									0.075	0.760	9.54
12.0-13.0	1.194									1.194	15.353	12.38
13.0-14.0	1.020									1.020	15.317	15.29
14.0-15.0	0.269	0.146								0.415	7.846	18.90
15.0-16.0	0.080	1.577								1.657	41.317	24.92
16.0-17.0	0.240	9.481								9.721	282.643	29.07
17.0-18.0	0.176	10.613								10.789	374.855	34.99
18.0-19.0	0.039	7.451								7.490	312.536	41.99
19.0-20.0	0.012	5.938	0.240							6.191	302.748	49.52
20.0-21.0		3.604	0.790							4.394	255.483	58.14
21.0-22.0		1.898	3.099							4.997	348.415	68.75
22.0-23.0		0.968	5.163							6.132	496.857	79.97
23.0-24.0		1.288	5.936							7.224	659.783	91.00
24.0-25.0		0.485	3.535							4.020	425.111	106.75
25.0-26.0		0.500	2.128							2.628	324.159	122.22
26.0-27.0		0.045	0.853	0.052						0.950	132.731	138.86
27.0-28.0			0.262	0.047						0.309	49.073	156.65
28.0-29.0			0.043	0.148						0.191	39.034	203.19

Length (cm)	Age/year class									Sum (10^9)	Biomass (10^3 t)	Mean weight (g)
	1	2	3	4	5	6	7	8	9			
	2023	2022	2021	2020	2019	2018	2017	2016	2015			
29.0-30.0			0.060	0.043						0.103	22.626	217.40
30.0-31.0				0.117						0.117	28.084	237.69
31.0-32.0				0.018				0.077		0.095	26.542	278.02
32.0-33.0					0.021	0.180	0.059	0.414		0.674	205.013	304.32
33.0-34.0						0.143	0.061	1.024		1.229	397.241	323.00
34.0-35.0							0.056	0.465	0.014	0.535	181.439	340.52
35.0-36.0								0.068		0.068	24.542	357.42
TSN (10^9)	3.109	43.995	22.109	0.424	0.021	0.323	0.176	2.048	0.014	72.321		
TSB (10^3 t)	53.788	1943.005	2055.332	87.421	6.173	97.890	57.020	663.762	5.144		4984.863	
Mean length (cm)	12.50	18.70	23.12	28.42	32.00	32.46	33.06	33.08	34.00	20.14		
Mean weight (g)	14.93	49.94	95.95	204.02	292.00	303.70	325.34	324.99	364.00			75.27

Estimates based on Target strength (TS) Length (L) relationship: TS= 20.0 log (L) – 71.9

Table 7.3.2.2. NSSH. Summary of acoustic estimates by age in autumn 1999-2024. TSN and TSB are total stock numbers (10^9) and total stock biomass (10^3 tons) respectively.

Year	Age 1		Age 2		Age 3		Age 4+		Total	
	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB
1999	48.759	716.0	0.986	31.0	0.051	2.0			49.795	749.0
2000	14.731	383.0	11.499	560.0					26.230	943.0
2001	0.525	12.0	10.544	604.0	1.714	160.0			12.783	776.0
2002	**No data**									
2003	99.786	3090.0	4.336	220.0	2.476	326.0			106.597	3636.0
2004	14.265	406.0	36.495	2725.0	0.901	107.0			51.717	3252.0
2005	46.380	984.0	16.167	1055.0	6.973	795.0			69.520	2833.0
2006	1.618	34.0	5.535	398.0	1.620	211.0			8.773	643.0
2007	3.941	148.0	2.595	218.0	6.378	810.0	0.250	46.0	13.164	1221.0
2008	0.030	1.0	1.626	77.0	3.987*	287*	3.223*	373*	8.866*	738*
2009	1.538	48.0	0.433	52.0	1.807	287.0	1.686	393.0	5.577	815.0
2010	1.047	35.0	0.315	34.0	0.234	37.0	0.428	104.0	2.025	207.0
2011	0.095	3.0	1.504	106.0	0.006	1.0			1.605	109.0
2012	2.031	36.0	1.078	66.0	1.285	195.0			4.394	296.0
2013	7.657	202.0	5.029	322.0	0.092	13.0	0.057	9.0	12.835	546.0
2014	4.188	62.0	1.822	126.0	6.825	842.0	0.162	25.0	13.011	1058.0
2015	1.183	6.0	9.023	530.0	3.214	285.0	0.149	24.0	13.569	845.0
2016	7.760	131.0	1.573	126.0	3.089	389.0	0.029	6.0	12.452	652.0
2017	34.950	820.0	2.138	141.0	3.465	412.0	0.982	210.0	41.537	1583.0
2018**	0.530	22.6	6.035	526.0	1.299	165.5	0.897	171.7	1.165	482.5
2019	13.650	172.0	0.209	15.1	6.000	756.0	1.600	487.0	21.460	1430.0
2020			0.231	13.0	1.816	189.0	11.59*	2796*	13.636*	2998*
2021	1.410	80.8	0.120	10.1	0.360	39.5	0.720	144.7	2.610	275.1
2022**	4.442	155.2	0.882	76.6	0.000	0.0	1.459	412.3	6.783	645.7
2023	64.115	925.2	32.920	1558.1	4.443	546.7	2.458	752.9	103.935	3783.0
2024	3.109	53.8	43.995	1943.0	22.109	2055.3	2.993	912.3	72.321	4984.9
Average	15.740	355.3	7.880	461.3	3.340	371.3	1.790	429.2	27.050	1420.0

*in mix with Kanin herring in the south-eastern part of the coverage area

**survey coverage only on Norwegian (western) side

7.4 Blue whiting (*Micromesistius poutassou*)

7.4.1 Geographical distribution

Blue whiting contributes to make up the mid-trophic pelagic component in the south-western part of the Barents Sea ecosystem. The Barents Sea is on the border of the distribution area for the blue whiting, but with incoming strong year-classes, increased abundance of young blue whiting in the Barents Sea is normally observed. The distribution of blue whiting from the BESS 2024 is shown in Figure 7.4.1.1. The distribution in 2024 was similar to 2023 following the shelf edge north to Svalbard (Spitsbergen) and with some recordings stretching north of Svalbard (Spitsbergen).

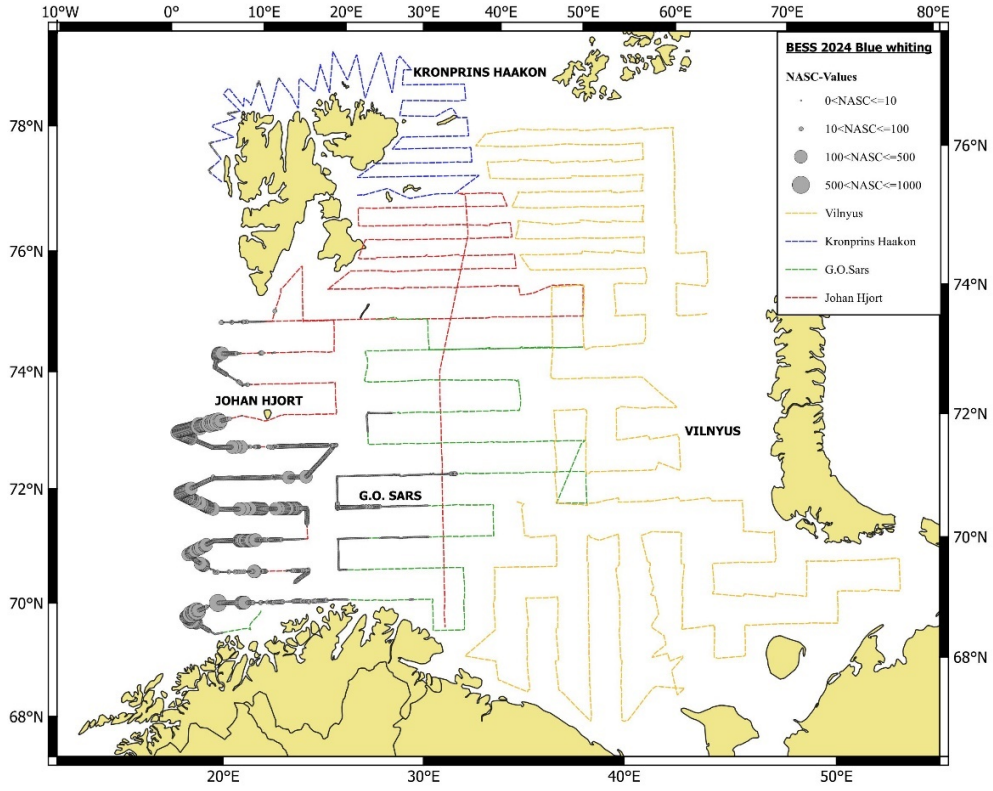

Figure 7.4.1.1. Geographical distribution of blue whiting in autumn 2024 based on acoustic recordings. Circle sizes correspond to NASC values (m^2/nm^2) per nautical mile.

7.4.2 Abundance by size and age

The estimated total number and biomass of blue whiting in the Barents Sea in the autumn 2024 is shown in table 7.4.2.1, and the time series of abundance estimates is summarized in Table 7.4.2.2.

The total abundance and biomass are higher than in 2023 but below the long-term average (Table 7.4.2.2). The 3 and 4-year-olds (2021 and 2020 year classes) dominate both the abundance and biomass (Table 7.4.2.1).

Table 7.4.2.1 Blue whiting. Acoustic estimate in the Barents Sea in August-October 2024. All values in the table are derived from average number and biomass at length and age from 500 bootstrap runs in StoX 4.0.0.

Length (cm)	Age/year class													Sum (10^6)	Biomass (10^3 t)	Mean weight (g)
	1	2	3	4	5	6	7	8	9	10	11	12	15			
	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2009			
20.0-21.0	0.6													0.6	0.0	44.33
21.0-22.0	2.5													2.5	0.1	54.96
22.0-23.0	3.6	5.8												9.4	0.6	62.12
23.0-24.0	14.2	0.7	0.9											15.9	1.1	73.05
24.0-25.0	1.1	5.2	3.4	0.7										10.4	0.9	86.04
25.0-26.0			19.4											19.4	2.0	101.47
26.0-27.0		2.4	19.0	15.3										36.7	4.1	112.29
27.0-28.0			36.8	25.1	9.9									71.7	9.0	126.09
28.0-29.0			32.3	54.9	6.9									94.0	13.4	142.51
29.0-30.0		1.0	19.2	7.5	27.0									54.7	8.5	156.99
30.0-31.0			11.2	22.0	8.9	11.0	5.5			3.9				62.3	10.7	170.68
31.0-32.0			2.9	5.9	8.2		1.8	1.7	1.8					22.3	4.2	189.94
32.0-33.0				3.7	6.9		5.8	2.8		3.3	3.9			26.3	5.2	199.15
33.0-34.0				4.1							5.4			9.5	2.1	220.59
34.0-35.0						3.2	4.0	3.6				3.1		13.8	3.5	250.26
35.0-36.0						3.6	1.4	3.4	1.5	1.9				11.9	3.3	270.30
36.0-37.0							0.1	4.0		0.1				4.3	1.3	300.24
37.0-38.0										0.2				0.2	0.1	243.00
38.0-39.0																

Length (cm)	Age/year class													Sum (10^6)	Biomass (10^3 t)	Mean weight (g)
	1	2	3	4	5	6	7	8	9	10	11	12	15			
	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2009			
39.0-40.0																
40.0-41.0																
41.0-42.0																
42.0-43.0													0.1	0.1	0.0	402.00
43.0-44.0																
TSN (10^6)	22.0	15.2	144.9	139.2	67.6	17.8	18.6	15.5	3.3	9.4	9.2	3.1	0.1	499.0		
TSB (10^3 t)	1.5	1.3	19.1	20.2	10.9	3.9	3.9	3.8	0.8	1.9	2.0	0.8	0.0		70.8	
Mean length (cm)	22.30	24.50	27.10	28.20	29.10	31.10	32.20	33.10	33.00	32.10	32.50	34.00	42.00	28.00		
Mean weight (g)	66.70	92.60	128.90	143.90	159.00	202.20	214.20	224.00	217.80	196.30	216.60	257.20	402.00			143.77

Estimates based on Target strength (TS) Length (L) relationship: TS= 20 log (L) - 65.2

Table 7.4.2.2 Blue whiting. Acoustic estimates by age in autumn 2004-2024. TSN and TSB are total stock numbers (10^6) and total stock biomass (10^3 tons).

Year	Age 1		Age 2		Age 3		Age 4+		Total	
	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB	TSN	TSB
2004	669	26	439	33	1056	98	1211	159	3575	327
2005	649	20	523	36	1051	86	809	102	3039	244
2006	47	2	478	34	730	70	922	129	2177	235
2007	+	+	116	11	892	92	743	107	1757	210
2008	+	+	+	+	10	1	238	36	247	37
2009	1	+	+	+	6	1	359	637	366	65
2010			2		5	1	155	31	163	33
2011	2	+	2	+	13	2	93	22	109	25
2012	583	27	64	8	58	9	321	77	1025	121
2013	1		349	28	135	13	175	42	664	84
2014	111	5	19	2	185	20	127	28	443	55
2015	1768	71	340	29	134	15	286	44	2529	159
2016	277	13	1224	82	588	48	216	36	2351	188
2017	43	2	253	22	503	49	269	38	1143	115
2018			18	1	74	8	215	29	332	40
2019	54	2	64	5	66	8	162	27	347	43
2020	110	5	19	2	11	1	56	11	196	18
2021	406	17	58	5	39	5	67	13	584	40
2022	195	8	143	12	41	4	58	10	437	34
2023	29	2	61	5	84	10	100	17	275	34
2024	22	1	15	1	145	19	284	48	499	71
Average	292	14	220	19	277	27	327	78	1060	104

Estimates based on Target strength (TS) Length (L) relationship : TS = 20 log (L) - 65.2 (Recalculation by Åge Høines, IMR 2017)

Note:«+» <0.5

Table 7.4.2.3 Summary of stock size estimates for blue whiting in 2023-2024.

Year class		Age	Numbers (10^6)		Mean weight (g)		Biomass (10^3 t)	
2023	2022	1	22.0	29.3	66.73	56.52	1.5	1.7
2022	2021	2	15.2	61.3	92.61	88.57	1.3	5.4
2021	2020	3	144.9	84.0	128.93	118.40	19.1	9.9
2020	2019	4+	283.8	100.2	166.41	136.44	48.1	17.4
Total stock in:								
2024	2023	Total	499.0	274.8	143.77	125.37	70.8	34.5

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