Herring (*Clupea harengus*) in subareas 1, 2, and 5, and in divisions 4.a and 14.a, Norwegian spring-spawning herring (Northeast Atlantic and Arctic Ocean)

ICES advice on fishing opportunities

ICES advises that when the long-term management strategy agreed by the UK, the Faroe Islands, Iceland, Norway, the Russian Federation, and the European Union is applied, catches in 2025 should be no more than 401 794 tonnes.

Non-fisheries conservation considerations

Conservation aspects and associated management measures may exist at a national or regional level but were not reviewed by ICES.

Stock development over time

Fishing pressure on the stock is above F_{MSY} and between F_{pa} and F_{lim}; spawning-stock size is below MSY $B_{trigger}$, and B_{pa}, and above B_{lim}.

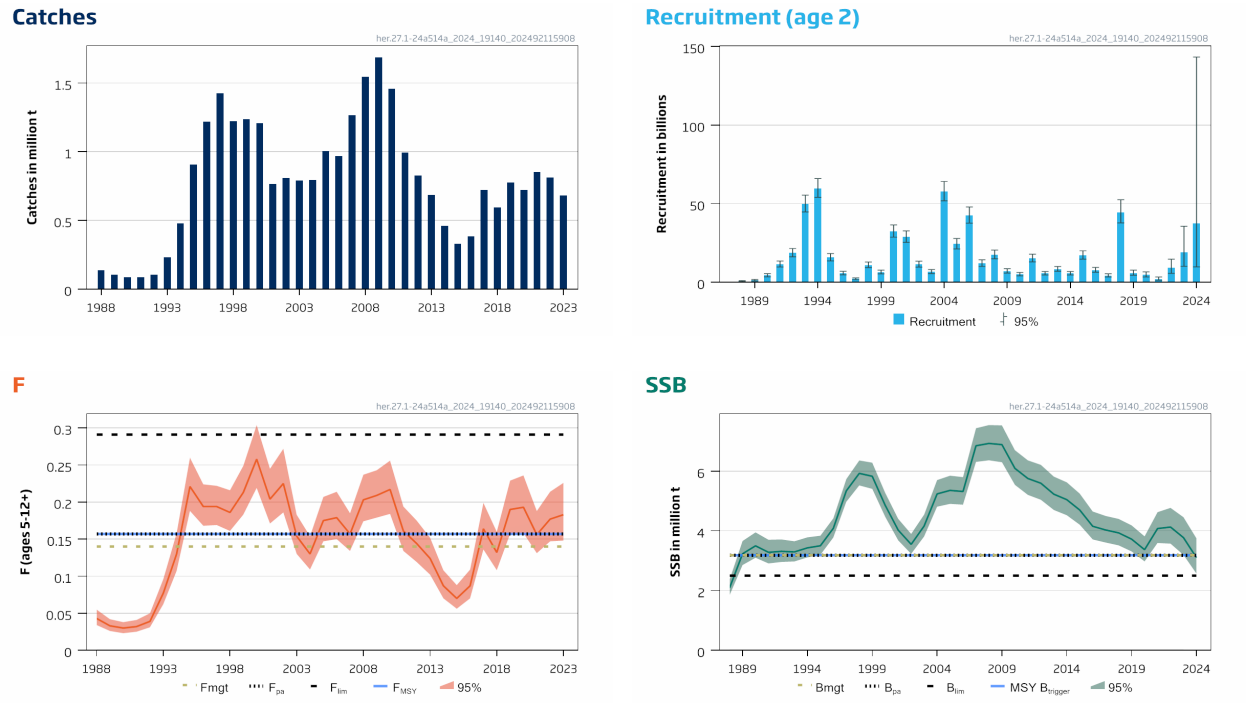

Figure 1 Herring in subareas 1, 2, and 5, and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Summary of the stock assessment.

Catch scenarios

Table 1 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Values in the forecast and for the interim year.

Variable	Value	Notes
$F_{ages\ 5–12+}$ (2024)	0.134	Based on assumed catches in 2024
SSB (2025)	2 933 000	From the assessment model; tonnes
$R_{age\ 2}$ (2024)	37.429	From assessment model; billions
$R_{age\ 2}$ (2025)	11.271	Median stochastic recruitment based on the years 1988–2024; billions
Catch (2024)	446 928	Sum of declared unilateral quotas; tonnes

Table 2 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2025)	F (2025)	SSB (2026)	% SSB change*	% catch change**	% advice change***	% probability of falling below B_{lim} in 2026
ICES advice basis							
Agreed management strategy^	401794	0.107	3289632	12	−10	3	2
Other scenarios							
MSY approach: $F_{MSY} \times SSB_{2025}/MSY\ B_{trigger}$	533844	0.145	3146669	7	19	37	4
F = 0	0	0	3551162	21	−100	−100	0
F_{pa}	570275	0.157	3126069	7	28	46	5
F_{lim}	984889	0.291	2828110	−4	120	153	21
$SSB_{2026} = B_{lim}$^^	1410171	0.434	2500000	−15	216	262	50
$SSB_{2026} = B_{pa} = MSY\ B_{trigger}$^^	493602	0.133	3184000	9	10	27	3
$F = F_{2024}$	497087	0.134	3187530	9	11	27	3

* SSB_{2026} relative to SSB_{2025} (2 933 000 tonnes)
** Catch in 2025 relative to ICES estimated catch in 2024 (446 928 tonnes).
*** Advice value 2025 relative to advice value 2024 (390 010 tonnes).
^ According to the harvest control rule in the management strategy F(2025) = 0.107, since the SSB is forecasted to be between SSB_{mgt} and $SSB_{mgt\ lower}$ on 1 January 2025.
^^ SSB_{2026} values are the closest available approximation to B_{lim} and MSY $B_{trigger}$.

The advice for 2025 increases slightly compared to 2024 since the incoming year class (2021) is estimated to be stronger than average, and the 2016 year class is revised upwards.

Basis of the advice

Table 3 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). The basis of the advice.

Advice basis	Management strategy
Management strategy	A long-term management strategy was agreed by the European Union, the Faroe Islands, Iceland, Norway, and Russian Federation in 2018 (Agreed record of conclusions…, 2018) and subsequently by UK (Agreed record of conclusions…, 2020). ICES has evaluated the long-term management strategy and found it to be precautionary (ICES, 2018a).

Quality of the assessment

The estimated SSB and fishing mortality are consistent with the estimates from last year's assessment. The 2016 year class has been revised upward over the last years.

The estimated recruitment in 2024 is now taken from the assessment model. Last year the geometric mean was used. The reason for this change is that the abundance of age 2 was available from the 2024 Barents Sea survey (which had reduced coverage compared to previous years).

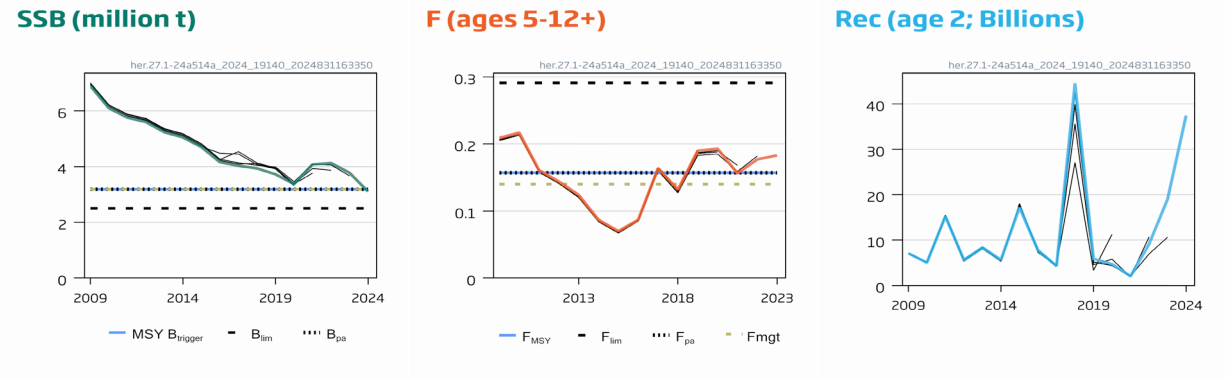

Figure 2 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Historical assessment results.

Issues relevant for the advice

There has been an overshoot of the catches in relation to the ICES-advised catch since 2013. The advice is based on the target fishing mortality in the long-term management strategy agreed by the European Union, the Faroe Islands, Iceland, Norway, United Kingdom and the Russian Federation; it does not consider the deviations from the long-term management strategy as evident from the sum of declared unilateral quotas. During the evaluation of the long-term management strategy (ICES, 2018a), a consistent overshooting of the TAC was not included in the simulations. Therefore, failing to adhere to the advised catches as derived from the application of the long-term management strategy may not be precautionary. Specifically, this may result in an increased risk for the stock to fall below B_{lim} and loss of catch in the long term.

Reference points

Table 4 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Reference points, values, and their technical basis. F values correspond to fishing mortality weighted by the population numbers, for ages 5–12+.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	3.184	B_{pa}; in million tonnes.	ICES (2018b)
	F_{MSY}	0.157	Stochastic simulations with Beverton–Holt, segmented regression, and Ricker stock–recruitment relationships, capped to F_{P05}	ICES (2018a)
Precautionary approach	B_{lim}	2.5	MBAL (accepted in 1998); in million tonnes	ICES (2018b)
	B_{pa}	3.184	Based on B_{lim} and assessment uncertainties. $B_{lim} \times \exp(1.645 \times \sigma)$, with $\sigma = 0.147$; in million tonnes.	ICES (2018b)
	F_{lim}	0.291	Equilibrium scenarios with stochastic recruitment: F value corresponding to 50% probability of SSB < B_{lim}	ICES (2018a)
	F_{pa}	0.157	F_{P05}; the F that leads to SSB ≥ B_{lim} with 95% probability	ICES (2018a, 2021)
EU–Faroes–Iceland–Norway–UK–Russian Federation long-term management strategy	SSB_{mgt_lower}	2.5	Precautionary HCR evaluated by MSE; SSB values in million tonnes	ICES (2018a)
	SSB_{mgt}	3.184		
	F_{mgt_lower}	0.05		
	F_{mgt}	0.14		

Basis of the assessment

Table 5 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2023)
Assessment type	Age-based analytical model (SAM)*.
Input data	Assessment period 1988–2024: commercial catches-at-age (stock weight-at-age from surveys and, since 2009, from catch sampling). Three survey indices: Norwegian acoustic survey on spawning grounds in February/March (NASF [A7918]; 1988–1989, 1994–1996, 1998–2000, 2005–2008, 2015–2024); International Ecosystem Survey in the Nordic Seas (IESNS; A3675) covering the adult stock in the Nordic seas (1996–2024), and the juvenile stock in the Barents Sea (1991–2002, 2005–2007, 2009-2019, 2021,2024). Maturity ogive variable by year-class strength. Natural mortalities are fixed values from historical analyses (age 2 = 0.9; ages greater than 2 = 0.15).
Discards and bycatch	Not included, considered negligible
Indicators	None
Other information	This stock was benchmarked in 2016 (ICES, 2016). A re-evaluation of reference points and the current management plan took place in 2018 (ICES, 2018a, 2018b).
Working group	Working Group on Widely Distributed Stocks (WGWIDE; ICES, 2024)

*View assessment in Transparent Assessment Framework (TAF)

History of the advice, catch, and management

Table 6 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). ICES advice and landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Sum of agreed quotas	ICES catch
1987	TAC	150000	115000	127306
1988	TAC	120000–150000	120000	135301
1989	TAC	100000	100000	103830
1990	TAC	80000	80000	86411
1991	No fishing from a biological point of view	0	76000	84683
1992	No fishing from a biological point of view	0	98000	104448
1993	No increase in F	119000	200000	232457
1994	Gradual increase in F towards $F_{0.1}$; TAC suggested	334000	450000	479228
1995	No increase in F	513000	900000*	905501
1996	Keep SSB above 2.5 million tonnes	-	1425000*	1220283
1997	Keep SSB above 2.5 million tonnes	-	1500000	1426507
1998	Do not exceed the harvest control rule	-	1300000	1223131
1999	Do not exceed the harvest control rule	1263000	1300000	1235433
2000	Do not exceed the harvest control rule	≤ 1500000	1250000	1207201
2001	Do not exceed the harvest control rule	753000	850000	766136
2002	Do not exceed the harvest control rule	853000	850000	807795
2003	Do not exceed the harvest control rule	710000	711000*	789510
2004	Do not exceed the harvest control rule	825000	825000*	794066
2005	Do not exceed the harvest control rule	890000	1000000*	1003243
2006	Do not exceed the harvest control rule	732000	967000*	968958
2007	Do not exceed the harvest control rule	1280000	1280000	1266993
2008	Do not exceed the harvest control rule	1518000	1518000	1545656
2009	Do not exceed the harvest control rule	1643000	1643000	1687371
2010	Do not exceed the harvest control rule	1483000	1483000	1457015
2011	See scenarios in the 2010 advice	988000–1170000	988000	992997
2012	Follow the management plan	833000	833000	826000
2013	Follow the management plan	619000	692000*	684743
2014	Follow the management plan	418487	436893*	461306
2015	Follow the management plan	283013	328206*	328740
2016	Follow the management plan	≤ 316876	376612*	383174
2017	Follow the management plan	≤ 437364**	805142*	721566
2018	Follow the management plan	≤ 384197	546448*	592899

Year	ICES advice	Catch corresponding to advice	Sum of agreed quotas	ICES catch
2019	Follow the management strategy, F_{mgt} = 0.14 and B_{mgt} = 3.184 million tonnes	≤ 588562	773750*	777165
2020	Follow the management strategy, F_{mgt} = 0.14 and B_{mgt} = 3.184 million tonnes	≤ 525594	693915*	720937
2021	Follow the management strategy, F_{mgt} = 0.14 and B_{mgt} = 3.184 million tonnes	≤ 651033	881097*	851813
2022	Follow the management strategy, F_{mgt} = 0.14 and B_{mgt} = 3.184 million tonnes	≤ 598588	827963*	813834
2023	Follow the management strategy, F_{mgt} = 0.14 and B_{mgt} = 3.184 million tonnes	≤ 511171	692942*	680552
2024	Follow the management strategy	≤ 390010	446928*	
2025	Follow the management strategy	≤ 401794		

* There was no agreement on the TAC; the number is the sum of the declared unilateral quotas.
** Value corrected in October 2017 (previously 646 075 tonnes).

History of the catch and landings

Table 7 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Catch distribution by fleet in 2023 as estimated by ICES.

Catch (2023)	Landings		Discards
680 552 tonnes	50% purse-seine	50% pelagic trawl	Discarding is considered to be negligible, but some slippage is known to occur.
	680 552 tonnes		

Table 8[†] Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). History of commercial landings; ICES estimated values are presented for each country participating in the fishery. All weights are in tonnes.

Year	Norway	Russian Federation*	Denmark	Faroes	Iceland	Ireland	Netherlands	Greenland	UK	Germany	France	Poland	Sweden	Total
1986	199256	26000	-	-	-	-	-	-	-	-	-	-	-	225256
1987	108417	18889	-	-	-	-	-	-	-	-	-	-	-	127306
1988	115076	20225	-	-	-	-	-	-	-	-	-	-	-	135301
1989	88707	15123	-	-	-	-	-	-	-	-	-	-	-	103830
1990	74604	11807	-	-	-	-	-	-	-	-	-	-	-	86411
1991	73683	11000	-	-	-	-	-	-	-	-	-	-	-	84683
1992	91111	13337	-	-	-	-	-	-	-	-	-	-	-	104448
1993	199771	32645	-	-	-	-	-	-	-	-	-	-	-	232457
1994	380771	74400	-	2911	21146	-	-	-	-	-	-	-	-	479228
1995	529838	101987	30577	57084	174109	-	7969	2500	881	556	-	-	-	905501
1996	699161	119290	60681	52788	164957	19541	19664	-	46131	11978	-	-	22424	1220283
1997	860963	168900	44292	59987	220154	11179	8694	-	25149	6190	1500	-	19499	1426507
1998	743925	124049	35519	68136	197789	2437	12827	-	15971	7003	605	-	14863	1223131
1999	740640	157328	37010	55527	203381	2412	5871	-	19207	-	-	-	14057	1235433
2000	713500	163261	34968	68625	186035	8939	-	-	14096	3298	-	-	14749	1207201
2001	495036	109054	24038	34170	77693	6070	6439	-	12230	1588	-	-	9818	766136
2002	487233	113763	18998	32302	127197	1699	9392	-	3482	3017	-	1226	9486	807795
2003	477573	122846	14144	27943	117910	1400	8678	-	9214	3371	-	-	6431	789510
2004	477076	115876	23111	42771	102787	11	17369	-	1869	4810	400	-	7986	794066
2005	580804	132099	28368	65071	156467	-	21517	-	-	17676	0	561	680	1003243
2006	567237	120836	18449	63137	157474	4693	11625	-	12523	9958	80	-	2946	968958
2007	779089	162434	22911	64251	173621	6411	29764	4897	13244	6038	0	4333	0	1266993
2008	961603	193119	31128	74261	217602	7903	28155	3810	19737	8338	0	0	0	1545656
2009	1016675	210105	32320	85098	265479	10014	24021	3730	25477	14452	0	0	0	1687371

[†] Version 2: Table 8 has been resized to display the values accurately.

Year	Norway	Russian Federation*	Denmark	Faroes	Iceland	Ireland	Netherlands	Greenland	UK	Germany	France	Poland	Sweden	Total
2010	871113	199472	26792	80281	205864	8061	26695	3453	24151	11133	0	0	0	1457015
2011	572641	144428	26740	53271	151074	5727	8348	3426	14045	13296	0	0	0	992997
2012	491005	118595	21754	36190	120956	4813	6237	1490	12310	11945	0	0	705	826000
2013	359458	78521	17160	105038	90729	3815	5626	11788	8342	4244	0	0	23	684743
2014	263253	60292	12513	38529	58828	706	9175	13108	4233	669	0	0	0	461306
2015	176321	45853	9105	33031	42625	1400	5255	12434	55	2660	0	0	0	328740
2016	197501	50455	10384	44727	50418	2048	3519	17508	4031	2582	0	0	0	383174
2017	389383	91118	19037	98170	90400	3495	6679	12569	4358	5201	0	1	1155	721566
2018	332028	64185	17052	82062	83393	2428	4290	2465	2582	1989	0	0	425	592899
2019	430507	84364	21207	113945	108045	2775	5111	3190	1801	4188	0	1327	705	777165
2020	409436	74936	16523	103029	98173	2704	5060	3546	143	2969	0	1352	3065	720937
2021	489632	92841^	15854	114291	114299	1793	10939	6456	0	3365	0	1242	1101	851813
2022	445938	85870	15014	122083	112739	3209	3783	6818	9620	5600	0	0	3160	813834
2023	389306	74145	10237	90371	92197	1016	6119	6647	7607	2158	0	0	750	680552

* USSR before 1992.

^ From ICES preliminary catch database.

Table 9 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Catches inside and outside the NEAFC regulatory areas (RAs), as estimated by ICES, as well as total landings. Weights are in tonnes.

Year	Inside the NEAFC RAs	Outside the NEAFC RAs	Total catches	Percentage inside the NEAFC RAs
2019	281092	496073	777165	36
2020	95322	625615	720937	13
2021*	20347	738626	758972	2
2022*	65015	662949	727964	10
2023	45342	635211	680552	7

* Without catches from the Russian Federation, which did not report catches inside/outside the NEAFC RAs for 2021 and 2022. In the past, around 50% of Russian catches were taken inside the NEAFC RAs.

Summary of the assessment

Table 10 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Assessment summary. All weights are in tonnes and recruitment in thousands. F is the fishing mortality weighted by population numbers.

Year	Recruitment (age 2)			SSB			Total catch	F (ages 5–12+)		
	Low	Value	High	Low	Value	High		Low	Value	High
1988	413000	667000	1077000	1846000	2092000	2372000	135301	0.034	0.043	0.055
1989	781000	1175000	1767000	2854000	3233000	3662000	103830	0.026	0.033	0.042
1990	3440000	4350000	5501000	3100000	3500000	3953000	86411	0.023	0.030	0.038
1991	9735000	11473000	13522000	2909000	3283000	3704000	84683	0.025	0.032	0.041
1992	16174000	18637000	21474000	2959000	3315000	3715000	104448	0.031	0.039	0.050
1993	44782000	49835000	55457000	2975000	3296000	3653000	232457	0.062	0.077	0.096
1994	54022000	59725000	66029000	3111000	3432000	3786000	479228	0.107	0.130	0.158
1995	13564000	15745000	18277000	3195000	3503000	3840000	905501	0.188	0.22	0.26
1996	4732000	5758000	7006000	3777000	4087000	4423000	1220283	0.168	0.194	0.22
1997	1650000	2145000	2789000	4974000	5342000	5737000	1426507	0.169	0.194	0.22
1998	9275000	10917000	12850000	5523000	5928000	6362000	1223131	0.161	0.186	0.22
1999	5319000	6421000	7753000	5407000	5831000	6288000	1235433	0.183	0.21	0.25
2000	28700000	32365000	36499000	4469000	4856000	5277000	1207201	0.22	0.26	0.30
2001	25430000	28838000	32702000	3682000	4028000	4407000	766136	0.171	0.20	0.25
2002	9636000	11373000	13423000	3229000	3549000	3900000	807795	0.186	0.23	0.27
2003	5509000	6674000	8085000	3811000	4163000	4547000	789510	0.130	0.154	0.183
2004	51844000	57668000	64146000	4810000	5239000	5705000	794066	0.109	0.130	0.154
2005	21186000	24306000	27886000	4905000	5357000	5852000	1003243	0.147	0.175	0.21
2006	37628000	42475000	47946000	4878000	5321000	5804000	968958	0.150	0.179	0.21
2007	10063000	12007000	14327000	6311000	6853000	7442000	1266993	0.134	0.157	0.185
2008	14909000	17481000	20497000	6364000	6931000	7548000	1545656	0.174	0.20	0.24
2009	5804000	7082000	8640000	6300000	6891000	7537000	1687371	0.179	0.21	0.24
2010	4053000	5020000	6218000	5541000	6096000	6707000	1457015	0.184	0.22	0.26
2011	12966000	15223000	17873000	5205000	5756000	6365000	992997	0.134	0.161	0.194
2012	4600000	5622000	6872000	5042000	5598000	6215000	826000	0.119	0.144	0.175
2013	6975000	8353000	10004000	4700000	5231000	5821000	684743	0.102	0.124	0.152
2014	4620000	5638000	6880000	4524000	5047000	5629000	461306	0.070	0.087	0.108
2015	14673000	17154000	20055000	4205000	4699000	5251000	328740	0.056	0.070	0.088
2016	6378000	7772000	9472000	3712000	4155000	4651000	383174	0.070	0.087	0.109
2017	3341000	4261000	5433000	3609000	4031000	4502000	721566	0.136	0.164	0.199
2018	37762000	44526000	52502000	3514000	3934000	4403000	592899	0.108	0.132	0.160
2019	4442000	5865000	7745000	3311000	3723000	4186000	777165	0.157	0.190	0.23
2020	3342000	4710000	6638000	2976000	3371000	3819000	720937	0.158	0.193	0.24
2021	1254000	2045000	3334000	3594000	4079000	4629000	851813	0.131	0.156	0.188
2022	5643000	9105000	14691000	3572000	4129000	4773000	813834	0.147	0.177	0.21
2023	10135000	19007000	35645000	3193000	3774000	4460000	680552	0.148	0.183	0.23
2024	9774000	37429000	143328000	2566000	3103000	3751000				

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Download the stock assessment data and figures.

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