

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 2024 should be no more than 390 010 tonnes.

ICES advice on conservation aspects

ICES has not identified any conservation aspects.

Stock development over time

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

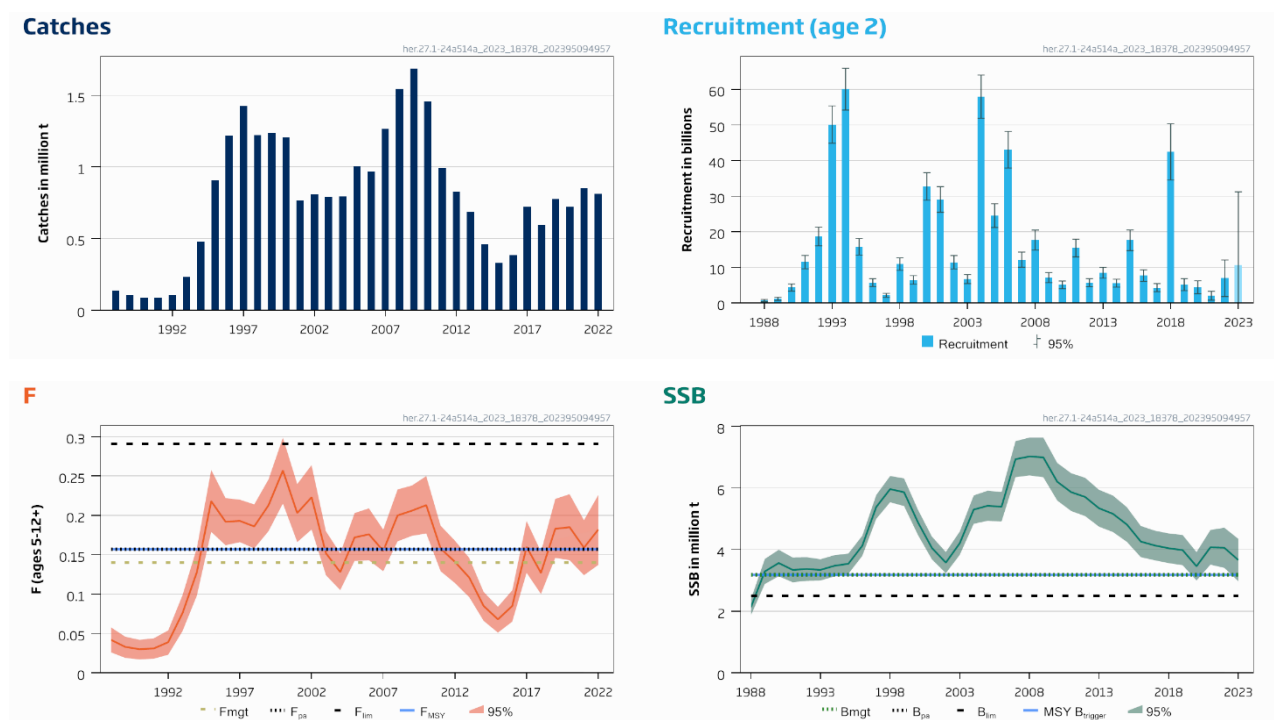


Figure 1 Herring in subareas 1, 2, and 5, and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Summary of the stock assessment. The assumed recruitment value for 2023 is shaded in a lighter colour.

Conservation status

ICES is not aware of any information on stock/species-specific conservation status.

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+} (2023)	0.186	Based on assumed catches in 2023.
SSB (2024)	3 059 464	From the assessment model; tonnes.
R _{age 2} (2023)	10.619	Median stochastic recruitment based on the years 1988–2022; billions.
R _{age 2} (2024)	10.619	Median stochastic recruitment based on the years 1988–2022; billions.
Catch (2023)	692 942	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 (2024)	F (2024)	SSB (2025)	% SSB change*	% catch change**	% advice change***	% probability of falling below B _{lim} in 2025
ICES advice basis							
Agreed management strategy [^]	390010	0.124	2913275	-5	-44	-24	15.7
Other scenarios							
MSY approach: F _{MSY} × SSB ₂₀₂₄ /MSY B _{trigger}	469953	0.151	2844892	-7	-32	-8	20.8
F = 0	0	0	3248398	6	-100	-100	1.9
F _{pa}	487686	0.157	2829739	-8	-30	-5	21.2
F _{lim}	850085	0.291	2521394	-18	23	66	51.4
SSB ₂₀₂₅ = B _{lim} ^{^^}	875324	0.301	2500022	-18	26	71	52.9
SSB ₂₀₂₅ = B _{pa} = MSY B _{trigger} ^{^^}	74667	0.023	3184058	4	-89	-85	2.9
F = F ₂₀₂₃	570511	0.186	2759039	-10	-18	12	27.7

* SSB₂₀₂₅ relative to SSB₂₀₂₄ (3 059 464 tonnes)

** Catch in 2024 relative to ICES estimated catch in 2023 (692 942 tonnes).

*** Advice value 2024 relative to advice value 2023 (511 171 tonnes).

[^] According to the harvest control rule in the management strategy F(2024) = 0.124, since the SSB is forecasted to be below SSB_{mgt} on 1 January 2024 (the -20% catch constraint in the management strategy does not apply when SSB is below SSB_{mgt}).

^{^^} SSB₂₀₂₅ values are the closest available approximation to B_{lim} and B_{trigger}.

The advice for 2024 is 24% lower than for 2023 because: (1) the adult stock size is declining because of low recruitment since the large 2016 year class; and (2) F advised is reduced compared to last year since the SSB in 2024 is predicted to be below SSB_{mgt} (= MSY B_{trigger}).

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 (Anon, 2018) and subsequently by the UK (Anon, 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 Russian Barents Sea survey (IESNS; A3675) was not conducted in 2022 or 2023. There was no survey information on age 2, and therefore median stochastic recruitment based on the years 1988–2022 was used instead in the forecast. However, this has a negligible impact on the advised catches.

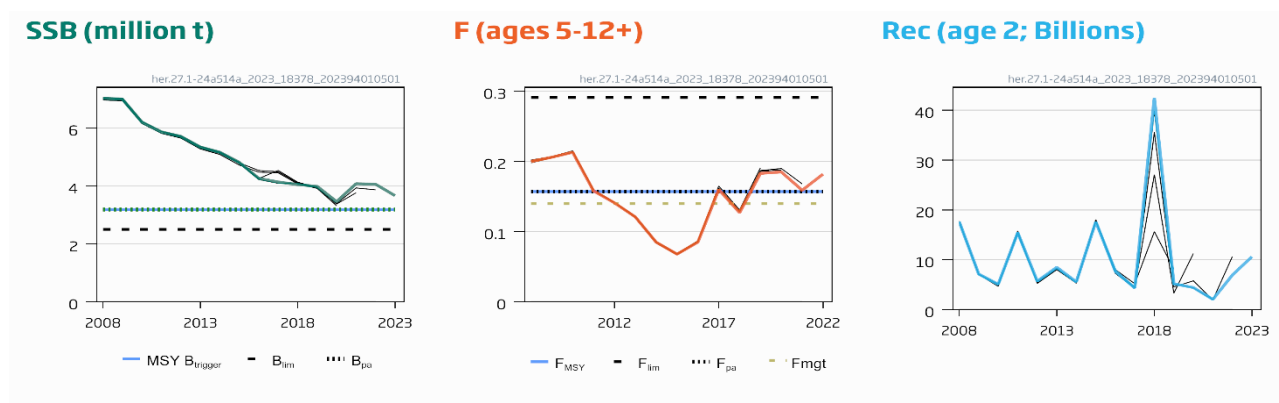


Figure 2 Herring in subareas 1, 2, and 5 and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Historical assessment results.

Issues relevant for the advice

The 2016 year class is expected to dominate the catches in 2024 (45%), and the subsequent year classes recruiting to the fishery are estimated to be weak.

SSB is predicted to be below SSB_{mgt} in 2025 even if the management plan is applied in 2024.

There has been an overshoot of the catches in relation to the advised TAC 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, 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 $SSB \geq B_{lim}$ with 95% probability.	ICES (2018a, 2021)
EU–Faroes–Iceland–Norway–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, 2023a).
Assessment type	Statistical assessment model (XSAM; ICES, 2016).
Input data	Assessment period 1988–2023: 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, 2015–2023); International Ecosystem Survey in the Nordic Seas (IESNS; A3675) covering the adult stock in the Nordic seas (1996–2023), and the juvenile stock in the Barents Sea (1991–2002, 2005–2007, 2009–2019, 2021). 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 (WGWISE; ICES 2023b).

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
2019	Follow the management strategy, $F_{mgt} = 0.14$ and $B_{mgt} = 3.184$ million tonnes	≤ 588562	773750*	777165

Year	ICES advice	Catch corresponding to advice	Sum of agreed quotas	ICES catch
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*	
2024	Follow the management strategy	≤ 390010		

* 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 2022 as estimated by ICES.

Catch (2022)	Landings		Discards
813 834 tonnes	46% purse seine	54% pelagic trawl	Discarding is considered to be negligible, but some slippage is known to occur.
	813 843 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	Faroës	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
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

[†] 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
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

* 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

* Without catches from the Russian Federation, which did not report catches inside/outside the NEAFC RAs for 2021 or 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 millions. 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	355	673	991	1865000	2128000	2392000	135301	0.026	0.042	0.058
1989	699	1172	1644	2884000	3292000	3700000	103830	0.0190	0.033	0.046
1990	3332	4345	5358	3134000	3566000	3998000	86411	0.0170	0.030	0.042
1991	9613	11486	13358	2940000	3343000	3747000	84683	0.0180	0.031	0.044
1992	16075	18699	21323	2985000	3371000	3757000	104448	0.023	0.039	0.054
1993	44891	50139	55387	2997000	3344000	3691000	232457	0.053	0.076	0.099
1994	54208	60080	65952	3130000	3476000	3822000	479228	0.098	0.128	0.159
1995	13489	15817	18145	3212000	3543000	3874000	905501	0.179	0.22	0.26
1996	4620	5733	6846	3795000	4126000	4456000	1220283	0.162	0.192	0.22
1997	1594	2151	2708	4996000	5385000	5775000	1426507	0.166	0.193	0.22
1998	9171	10937	12704	5538000	5966000	6394000	1223131	0.158	0.186	0.21
1999	5277	6486	7696	5415000	5865000	6315000	1235433	0.180	0.21	0.25
2000	28879	32755	36631	4471000	4884000	5298000	1207201	0.22	0.26	0.30
2001	25496	29101	32706	3683000	4055000	4427000	766136	0.166	0.20	0.24
2002	9574	11450	13326	3234000	3579000	3925000	807795	0.182	0.22	0.26
2003	5456	6733	8010	3828000	4209000	4590000	789510	0.124	0.152	0.180
2004	51898	57974	64050	4837000	5300000	5763000	794066	0.105	0.128	0.152
2005	21212	24559	27906	4936000	5426000	5915000	1003243	0.142	0.172	0.20
2006	37913	43071	48228	4912000	5393000	5873000	968958	0.143	0.176	0.21
2007	10047	12179	14310	6351000	6937000	7523000	1266993	0.129	0.155	0.182
2008	14874	17671	20469	6410000	7025000	7640000	1545656	0.167	0.20	0.23
2009	5724	7135	8546	6351000	6997000	7643000	1687373	0.174	0.21	0.24
2010	4010	5094	6178	5592000	6205000	6819000	1457014	0.177	0.21	0.25
2011	12955	15441	17926	5253000	5867000	6482000	992998	0.129	0.158	0.187
2012	4569	5712	6855	5088000	5712000	6335000	825999	0.114	0.141	0.168
2013	6964	8495	10026	4744000	5344000	5944000	684743	0.096	0.121	0.146
2014	4455	5577	6700	4571000	5164000	5758000	461306	0.066	0.085	0.103
2015	14728	17619	20510	4252000	4816000	5380000	328740	0.051	0.068	0.084
2016	6071	7702	9333	3755000	4263000	4771000	383174	0.065	0.085	0.105
2017	3182	4314	5445	3653000	4136000	4619000	721566	0.127	0.160	0.193
2018	34551	42477	50403	3563000	4046000	4528000	592899	0.100	0.127	0.154
2019	3486	5170	6854	3494000	3986000	4479000	777165	0.146	0.183	0.22
2020	2600	4424	6247	2998000	3461000	3923000	720937	0.143	0.185	0.23
2021	783	2043	3303	3512000	4077000	4642000	851813	0.124	0.159	0.194
2022	1790	6944	12099	3406000	4060000	4714000	813834	0.137	0.182	0.23
2023	0	10619	31256	2974000	3664000	4353000				

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[Download the stock assessment data and figures.](#)

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