NORSK-ÍSLENSK VORGOTSSÍLD
NORWEGIAN SPRING-SPAWNING HERRING
Clupea harengus

RÁÐGJÖF – *ADVICE*

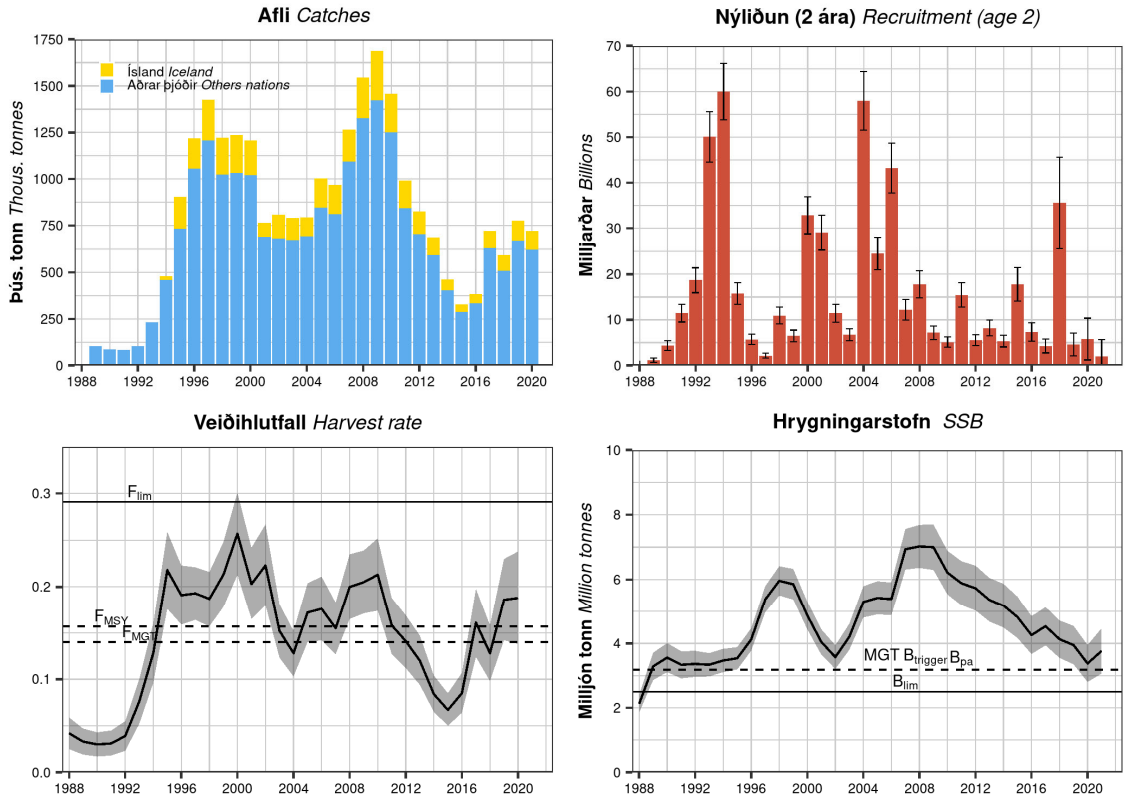
Alþjóðahafrannsóknaráðið (ICES) ráðleggur í samræmi við langtímanýtingarstefnu samþykkta af Evrópusambandinu, Færeyjum, Íslandi, Noregi og Rússlandi að afli ársins 2022 verði ekki meiri en 598 588 tonn.

ICES advises that when the long-term management strategy agreed by the European Union, the Faroe Islands, Iceland, Norway, and the Russian Federation is applied, catches in 2022 should be no more than 598 588 tonnes.

STOFNÞRÓUN – *STOCK DEVELOPMENT*

Veiðidánartala stofnsins er metin yfir þeim fiskveiðidauða sem gefur hámarksafrakstur til lengri tíma litið (F_{MSY}) og er undir varúðarmörkum F_{lim}. Stærð hrygningarstofns er yfir lífmassa aðgerðarmörkum (MGT $B_{trigger}$), gátmörkum (B_{pa}) og varúðarmörkum (B_{lim}).

Fishing pressure on the stock is above F_{MSY} but beneath F_{lim}. Spawning-stock size is above MGT $B_{trigger}$, B_{pa}, and B_{lim}.



Norsk-íslensk vorgotssíld. Afli, nýliðun 2 ára, veiðidánartala og hrygningarstofn. Stofnmat keyrt frá 1988, eftir að stofn tók að stækka aftur eftir hrun á sjöunda áratug síðustu aldar.

Norwegian spring-spawning herring. *Catches, recruitment at age 2, fishing mortality and spawning stock biomass (SSB). Assessment run starts in 1988, when the stock has started to rebuild after collapse in the 1960s.*

STOFNMAT OG GÁTMÖRK – *BASIS OF ASSESSEMENT AND REFERENCE POINTS*

Forsendur ráðgjafar *Basis of the advice*	Aflaregla *Management strategy*
Aflaregla *Management strategy*	Langtímaaflaregla sem var samþykkt árið 2018 (Anon. 2018). *A long-term management strategy agreed in 2018 (Anon. 2018).*
Stofnmat *Assessment type*	Aldursaflalíkan (XSAM; ICES 2016). *Statistical age disaggregated assessment model (XSAM; ICES, 2016).*
Inntaksgögn *Input data*	Stofnmatstímabilið er 1988–2020: Aldursvísitölur (byggðar á þyngd eftir aldri úr leiðöngrum, og frá 2009 á sýnataka úr afla). Þrjár leiðangursvísitölur: Norskur bergmálsleiðangur á hrygningarsvæðum í febrúar/mars (NASF, 1994–2005, 2015–2021); Alþjóðlegur vistfræðileiðangur í Austurdjúpi í maí (IESNS; A3675) sem nær yfir fullorðnahluta stofnsins í Noregshafi (1996–2021) og tveggja ára síld í Barentshafi árin 1991–2019 og 2021 (enginn leiðangur var farinn 2020). Stofnstærðarháð mat á kynþroskahlutfalli eftir aldri. Fastur náttúrulegur dauði ákvarðaður frá eldri gögnum (settur sem 0.9 fyrir tveggja ára og 0.15 fyrir eldri en tveggja ára). *Assessment period 1988–2020: 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, 1994–2005, 2015–2021); International Ecosystem Survey in the Nordic Seas (IESNS; A3675) covering the adult stock in the Nordic seas (1996–2021), and the juvenile stock in the Barents Sea (1991–2021). 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).*

Nálgun *Framework*	Viðmiðunarmörk *Reference point*	Gildi *Value*	Grundvöllur *Technical Basis*	Heimild *Source*
MSY nálgun *MSY approach*	MSY $B_{trigger}$	3.184	B_{pa}; í milljónum tonna *B_{pa}; in million tonnes*	ICES (2018b, 2018c)
	F_{MSY}	0.157	Byggt á slembnum hermunum með Beverton-Holt, uppskiptri aðhvarfsgreiningu og Ricker stofn-nýliðunar samböndum, m.v. $F_{P0.05}$ *Stochastic simulations with Beverton–Holt, segmented regression, and Ricker stock–recruitment relationships, capped to $F_{P0.05}$*	ICES (2018a)
Varúðarnálgun *Precautionary approach*	B_{lim}	2.5	MBAL (samþykkt 1998); í milljónum tonna *MBAL (accepted in 1998); in million tonnes*	ICES (2018b, 2018c)
	B_{pa}	3.184	Byggt á B_{lim} og stofnmatsóvissu. $B_{lim} \times \exp(1.645 \times \sigma)$, með $\sigma = 0.147$; í milljónum tonna *Based on B_{lim} and assessment uncertainties.* *$B_{lim} \times \exp(1.645 \times \sigma)$, with $\sigma = 0.147$; in million tonnes*	ICES (2018b, 2018c)
	F_{lim}	0.291	Mismunandi sviðsmyndir metnar með slembinni nýliðun: F gildið samsvarar 50% líkum á SSB < B_{lim} *Equilibrium scenarios with stochastic recruitment: F value corresponding to 50% probability of (SSB < B_{lim})*	ICES (2018a)
	F_{pa}	0.157	$F_{P0.05}$; F sem leiðir til SSB ≥ B_{lim} með 95% líkum *$F_{P0.05}$; the F that leads to SSB ≥ B_{lim} with 95% probability*	ICES (2018a, 2021a)
Langtímanýtingarstefna Evrópusambandsins, Færeyja, Íslands, Noregs og Rússlands *EU-Faroes-Iceland-Norway-Russian Federation long-term management strategy*	SSB_{mgt_lower}	2.5	Varkár aflaregla metin með nýtingastefnuhermunum. SSB gildi í milljónum tonna. *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		

HORFUR – *PROSPECTS*

Gert er ráð fyrir að 2016 árgangurinn verði ráðandi í aflanum árið 2022 og að framlag árganga 2017 og síðar verði lítið.

The 2016 year class is expected to dominate the catches in 2022 and the subsequent year classes recruiting to the fishery are estimated to be weak.

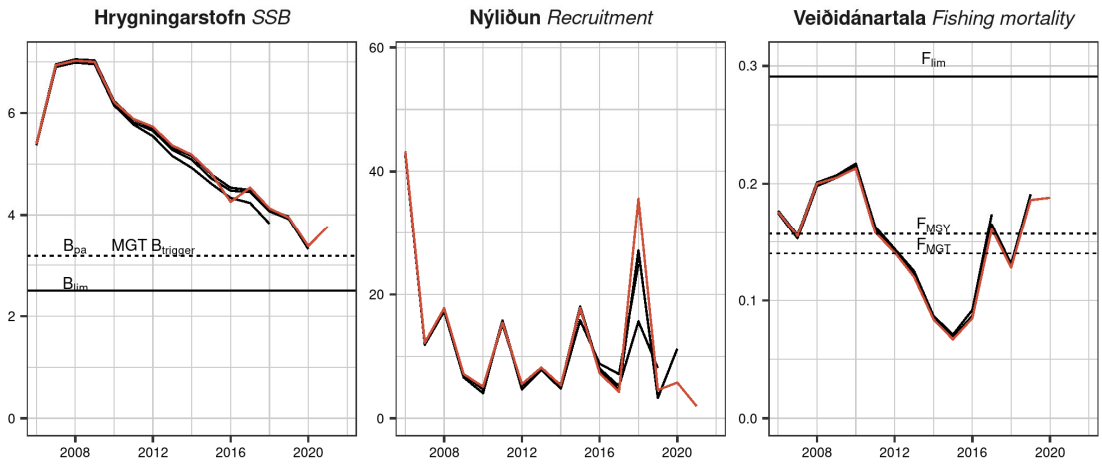
Norsk-íslensk síld. Áætluð þróun stærðar hrygningarstofns (tonn) miðað við veiðar samkvæmt aflareglu.
Norwegian spring-spawning herring. *Projection of SSB (tonnes) based on adopted management strategy.*

2021		2022			2023
Áætlaður afli *Estimated catches*	F	Aflamark skv. aflareglu *TAC based on management strategy*	Hrygn. stofn *SSB*	F	Hrygn. stofn *SSB*
881 097	0.174	598 588	3 919 597	0.14	3 607 952

GÆÐI STOFNMATS – *QUALITY OF THE ASSESSEMENT*

Samræmi í stofnmati hefur verið gott síðustu 5 ár. Mat á stærð 2016 árgangsins hefur hækkað frá fyrri árum.

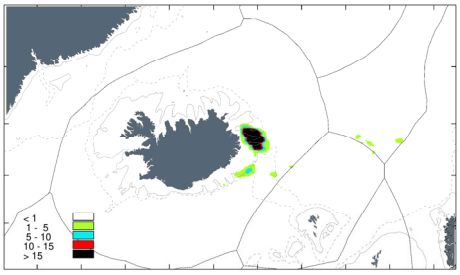
The estimated SSB and fishing mortality are generally in line with the estimates from last year's assessment. The recruitment of the 2016 year class is, however, revised upwards in this year's assessment.



Norsk-íslensk vorgotssíld. Samanburður á stofnmati áranna 2014–2021 (rauð lína: 2021).
Norwegian spring-spawning herring. *Current assessment (red line: 2021) compared with previous estimates (2014–2020).*

VEIÐAR ÍSLENDINGA – *THE ICELANDIC FISHERY*

Afli íslenskra skipa úr norsk-íslenska síldarstofninum árið 2020 var 98 173 tonn og var allur veiddur í flotvörpu. Rúmlega 95% aflans fékkst innan íslenskrar lögsögu, um 0,2% í færeyskri lögsögu og rúm 4% á alþjóða hafsvæðinu. Veiðar úr stofninum fóru fram frá júní til nóvember og var mest veitt í september (57%). Heildarafli allra þjóða úr stofninum árið 2020 var 720 937 tonn.



Norsk-íslensk síld. Veiðisvæði íslenskra skipa árið 2020 (t/sjm^2)
NSS herring. *Fishing grounds of the Icelandic fleet in 2020*

The Icelandic catch of Norwegian spring-spawning herring in 2020 was 98 173 tonnes, all caught with pelagic trawl. About 95% of the catches were taken within the Icelandic EEZ, 0,2% within the Faroese EEZ, and 4% in international waters. The fishery took place in June to November with the highest catches in September (57%). The total catch of all nations in 2019 amounted to 720 937 tonnes.

AÐRAR UPPLÝSINGAR – *OTHER INFORMATION*

Veiðar úr stofninum hafa verið umfram ráðgjöf síðan 2013. Ráðgjöfin fyrir þennan stofn byggir á fiskveiðidauða samkvæmt samþykktri aflareglu strandríkja að stofninum. Við prófanir á aflareglunni (ICES 2018a) var ekki tekið tillit til að afli væri kerfisbundið umfram ráðgjöf samkvæmt aflareglu. Við núverandi umframveiðar uppfyllir aflareglan mögulega ekki varúðarsjónarmið.

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 plan as evident from the sum of declared unilateral quotas. During the evaluation of the management strategy (ICES, 2018a), the implementation error in the form of a consistent overshoot of the TAC was not included. Therefore, failing to adhere to the advised catches as derived from the application of the long-term management strategy may no longer be precautionary in the long term.

RÁÐGJÖF, AFLAMARK OG AFLI – *ADVICE, TAC AND CATCH*

Norsk-íslensk síld. Tillögur um hámarksafla, aflamark samkvæmt ákvörðun stjórnvalda og afli (tonn).
Norwegian spring-spawning herring. *Recommended TAC, national TAC, and catches (tonnes).*

Ár *Year*	Tillaga ICES *Rec. TAC ICES*	Aflamark Ísland *Iceland national TAC*	Afli Íslendinga *Catches Iceland*	Aflamark allra þjóða *Total national TAC*	Afli alls *Total catch*
2011	988 000–1 170 000	145 000	151 074	988 000	992 997
2012	833 000	121 000	120 956	833 000	826 000
2013	619 000	90 000	90 729	692 000*	684 743
2014	418 487	61 000	58 828	436 893*	461 306
2015	283 013	41 000	42 626	328 206*	328 740
2016	≤ 316 876	46 000	50 186	376 612*	383 174
2017	≤ 437 364**	103 000	90 400	805 142*	721 566
2018	≤ 384 197	72 428	83 392	546 448*	592 899
2019	≤ 588 562	102 174	108 046	773 750*	777 165
2020	≤ 525 594	91 243	98 173	693 915*	720 937
2021	≤ 651 033	117 707		881 097*	
2022	≤ 598 588				

* Ekkert samkomulag um heildaraflamark; því er sýnd summan af aflamarki allra þjóða - *There was no agreement on the TAC; the number is the sum of autonomous quotas from the individual parties.*** Fyrri ráðgjöf upp á 646 075 þús. tonn var endurskoðuð í nóvember 2017 eftir að villa í stofnmati uppgötvaðist. - *The advice was revised in November 2017 from* 646 075 tonnes after an error in the assessment was noted.

HEIMILDIR OG ÍTAREFNI – *REFERENCES AND FURTHER READING*

Anon. 2018. Agreed record of conclusions of fisheries consultations between Iceland, the European Union, the Faroe Islands, Norway, and the Russian Federation on the management of the Norwegian spring-spawning (Atlanto-Scandian) herring stock in the North-East Atlantic in 2019. London, 6 November 2018. 6 pp. https://www.pelagic-ac.org/media/pdf/2019%20CS%20agreement%20on%20ASH%20TAC%20and%20LTM%20plan.pdf.

ICES. 2016. Report of the Benchmark Workshop on Pelagic Stocks (WKPELA), 29 February–4 March 2016, ICES Headquarters, Copenhagen, Denmark. ICES CM 2016/ACOM:34. 106 pp. https://doi.org/10.17895/ices.pub.5581.

ICES. 2018a. Report of the Workshop on a long-term management strategy for Norwegian Spring-spawning herring (WKNSSHMSE), 26–27 August 2018, Torshavn, Faroe Islands. ICES CM 2018/ACOM:53. 113 pp. https://doi.org/10.17895/ices.pub.5583. Annex 9 is available separately on ICES website.

ICES. 2018b. Report of the Workshop on the determination of reference points for Norwegian Spring Spawning Herring (WKNSSHREF), 10–11 April 2018, ICES Headquarters, Copenhagen, Denmark. ICES CM 2018/ACOM:45. 83 pp. https://doi.org/10.17895/ices.pub.5582.

ICES. 2021a. Advice on fishing opportunities. *In* Report of the ICES Advisory Committee, 2021. ICES Advice 2021, section 1.1.1. https://doi.org/10.17895/ices.advice.7720.

ICES. 2021b. Working Group on Widely Distributed Stocks (WGWIDE). ICES Scientific Reports. 3:95. 874 pp. http://doi.org/10.17895/ices.pub.8298

Recommended citation: ICES. 2021. Herring (*Clupea harengus*) in subareas 1, 2, 5 and divisions 4.a and 14.a, Norwegian spring-spawning herring (the Northeast Atlantic and Arctic Ocean). *In* Report of the ICES Advisory Committee, 2021. ICES Advice 2021, her.27.1-24a514a. https://doi.org/10.17895/ices.advice.7765.