

Iceland Responsible Fisheries Foundation (IRFF)

Iceland Responsible Fisheries Certification Programme



Icelandic Summer Spawning Commercial Fishery

2nd Surveillance Assessment Report

Certification Body (CB):	Global Trust Certification
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Fishery client:	Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland), The National Association of Small Boat Owners, Iceland (NASBO)
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Foreword

The Iceland Responsible Fisheries (IRF) Certification Programme is based on articles and substantive criteria from the United Nations Food & Agriculture Organization (FAO) reference documents, FAO Code of Conduct for Responsible Fisheries (CCRF(1995)) as well as the FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries (2005/2009).

A full description of the standard-setting arrangements, normative references and processes can be obtained from the Iceland Responsible Fisheries Foundation owns and operates the brand of Iceland Responsible Fisheries including the certification programme.

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2 Glossary

AIS	Automatic Identification System
B ₄₊	Biomass of 4 years and older fish
B _{lim}	The biomass limit reference point below which there is a high risk that recruitment will be impaired and that the stock could collapse
B _{loss}	The biomass below which there is no historical record of recruitment
B _{MSY}	SSB that is associated with Maximum Sustainable Yield (MSY)
B _{pa}	Precautionary reference point designed to have a low probability of being below B _{lim}
EEZ	Exclusive Economic Zone
EU	European Union
ETP	Endangered, Threatened and Protected species*
FAO	United Nations Food and Agriculture Organization
F _{lim}	Fishing mortality which in the long term will result in an average stock size at B _{lim}
F _{max}	Fishing mortality rate that maximizes equilibrium yield per recruit
F _{MGT}	Management elected fishing mortality target/limit; usually specified in FMP
FMP	Fishery Management Plan
F _{MSY}	Fishing mortality which in the long term will result in an average stock size at B _{MSY}
F _{pa}	Precautionary reference point for fishing mortality to avoid true fishing mortality being above F _{lim}
HCR	Harvest Control rule
ICES	International Council for the Exploration of the Sea
ICG	Icelandic Coast Guard
ITQ	Individual Transferable Quota
IUU	Illegal, Unreported and Unregulated fishing
IWC	International Whaling Commission
kt	kilo tonnes
MCS	Monitoring, Control and Surveillance
MII	Ministry of Industries and Innovation
MFRI	Marine and Freshwater Research Institute (formerly MRI)
MRI	Marine Research Institute (now MFRI)
MSY B _{trigger}	ICES MSY framework parameter that triggers advice on a reduced fishing mortality relative to F _{MSY}
MSY	Maximum Sustainable Yield; the largest average catch or yield that can continuously be taken from a stock under existing environmental conditions
NAFO	Northwest Atlantic Fisheries Organisation
NAMMCO	North Atlantic Marine Mammal Commission
NEAFC	North East Atlantic Fisheries Commission
NPA	National Program Action
NWWG	North-Western Working Group (within ICES)
SSB	Spawning stock biomass; total weight of all sexually mature fish in the stock
SSB _{MGT}	Management elected SSB target/limit; usually specified in FMP
SSB _{trigger}	SSB level that acts as a trigger when the stock fall below a certain level
TAC	Total Allowable Catch
UN	United Nations
VMEs	Vulnerable Marine Ecosystems
VMS	Vessel Monitoring System

*Species recognised by Icelandic legislation and/or binding international agreements to which the Icelandic authorities are party. Binding international agreements as applicable in Icelandic jurisdiction.

3 Executive Summary

This 2nd IRF surveillance audit was conducted in late 2021 by a team of two auditors, Vito Romito and Dankert Skagen, MD, whose experience, qualification and responsibilities has been detailed below in Section 3.1. These auditors also took part in the previous surveillance audit for this fishery. The site visits for the current surveillance were held remotely, due to Covid-19 travel restrictions. Video calls with the Client, industry, management, science and enforcement representatives were held on the 1st week of November 2021, to gather information on the fisheries under assessment, in addition to the desktop review part of the audit, and to discuss progress relative to any open non-conformances. This fishery audit was combined with the other 6 fisheries certified under the IRF program.

The fishery under assessment continues to remain in compliance with the IRF Standard Revision 2.0. Corrective actions and progress to close the active non-conformances are deemed to be on track. No new non-conformance has been identified during the 2nd surveillance activities. The Assessment Team recommends for the existing certification to be maintained.

3.1 Assessment Team Details

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The Assessment Team for this assessment was as follows; further details are provided in [Appendix 1](#)):

- Vito Romito – Lead Assessor, responsible for Section 2 (Compliance and Monitoring) and Section 3 (Ecosystem Considerations).
- Dankert Skagen – Assessor, responsible for Section 1 Fisheries Management (which includes requirements on harvest control rule and policy, stock assessment and status, advice and decisions on TAC).

3.2 Details of applicable IRF Documents

This assessment was conducted according to the relevant program documents outlined in Table 1 below.

Table 1. Relevant GULF RFM program documents including applicable versions.		
Document title	Version number, Issue Date	Usage
IRF Responsible Fisheries Management Standard Revision 2.0	Revision 2.0, June 2016	Standard
IRF Certification Requirements Revision 1.2	Version 1.2, October 2018	Process

4 Fishery Applicant Details

Table 2. Applicant details.

Applicant Contact Information	
Organisation/Company Name:	Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland)
Date:	November 2020
Address:	Building:
	Street: Borgartún 35
	City: Reykjavík
	Country: Iceland
	Postal Code:
Phone:	(354) 591 0300
Web:	www.sfs.is
Contact person:	Heiðrún Lind Marteinsdóttir
Position:	CEO
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Applicant Contact Information	
Organisation/Company Name:	The National Association of Small Boat Owners, Iceland (NASBO)
Date:	November 2020
Address:	Building:
	Street: Hverfisgötu 105
	City: 101 Reykjavik
	Country: Iceland
	Postal Code: IS-101
Phone:	(354) 552 7922
Web:	www.smabatar.is
Contact person:	Örn Pálsson
Position:	Managing Director
E-mail Address	orn@smabatar.is

5 Units of Certification

The Unit of Certification (i.e., what is covered by the fishery certificate) is described in the table below.

Table 3. Unit of Certification (UoC).	
Client Group	Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland), The National Association of Small Boat Owners, Iceland (NASBO)
Species:	Common name (ENG and ISL): Atlantic herring/herring (Síld)
	Latin name: <i>Clupea harengus</i>
Geographical Area(s)	Iceland 200-mile EEZ within FAO Fishing Area 27
Stock(s)	Herring in Division 5.a, summer-spawning herring (Iceland grounds)
Management System	Ministry of Industries and Innovation (Iceland)
Fishing gear(s)/method(s)	Purse seine net; Pelagic trawl; Gears from other Icelandic fisheries legally landing summer-spawning herring*
Client Group	Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland), The National Association of Small Boat Owners, Iceland (NASBO)

6 Assessment Process

This Assessment constitutes a summary evaluation of the applicant fisheries' continuing conformance (or not) to the relevant IRF Fisheries Standard and Scheme Requirements.

Surveillance audits are required to consider all sections of the IRF Standard, although this may take the form of a summary of relevant and new information that demonstrates the level of conformity to the criteria.

IRF surveillance audits are required to include:

- Compliance and progress of the fishery, specific to agreed corrective action plans against non-conformances raised in the initial certification or subsequent surveillance reports.
 - Sufficient detail on progress and evidence of close out shall be presented in surveillance reports.
- Changes in the management regime and processes that may affect the outcome of certification.
- New information on the status of stocks from recent survey, assessment and other information of a scientific basis that may affect the outcome of certification.
- Continued compliance with the IRF Standard.

Where areas of new non-conformity arise, these shall be managed in accordance with the Certification Requirements for assigning non-conformances.

6.1 Surveillance Meetings

The table below provides information about the remote site visit meetings held on the 1st week of November 2021 for the combined audit of the Icelandic cod, haddock, saithe, Golden redfish, common ling, tusk and summer spawning herring commercial fisheries.

Table 4. Summary of assessment meetings, 1st week of November 2021.

Meeting Date and Location	Personnel	Areas of discussion/agenda points
Date: 01 st of November 2021 Location: Remote, Video Call	The Client (opening meeting): Kristján Pórarinsson, Fisheries Iceland; Finnur Gardarsson, IRF Foundation. GT Assessment Team: Vito Romito Dankert Skagen	<ul style="list-style-type: none"> ▪ Brief review or key highlights of the 2020/2021 fishing season for cod, haddock, saithe, golden redfish, ling, tusk and ISS herring. Any key issues or updates from an industry perspective? ▪ Issues with/changes resulting from Covid pandemic? ▪ Any significant changes in the management system, key laws or regulations in the past 12 months? ▪ Cod 2021 benchmark / SSB downward and F upward revision. ▪ Any updates from the day to day operations of the large and small fleet sectors? ▪ Plans for revisiting/updating Fishery Management Plans? ▪ Non-Conforming Areas and Corrective Actions ▪ Corrective Action relating to Non-Conformance 1: <i>Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks.</i> Regarding NC 1, what are the updates, new information or developments addressing the issue? ▪ Corrective Action relating to Non-Conformance 2: <i>There is insufficient evidence that adverse impacts of the cod, haddock and saithe fisheries on the following ecosystem components: Spotted wolffish, and; Common loon are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</i>

		<ul style="list-style-type: none"> ▪ Regarding NC 2, what are the key developments regarding a) spotted wolffish (e.g. relating to research activities and/or live releases in the fishery)? In the last audit a potential recovery plan was discussed, as well as age reading and survival experiments in Icelandic waters. What are the updates? Has spotted wolffish been released in the past season? Catches in 2020/2021 were 1,300 t against a TAC of 314 t. Can we confirm if the excess catch (over the TAC) has been released alive and where is that recorded (the Fiskistofa website only reports total catch https://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/) ▪ As for b) the common loon element, what are the updates for the species? Is there any new data on this species abundance or bycatch in gillnet and longline gear? ▪ Any recent updates relating to the smartphone app deployed to facilitate recording of marine mammal and seabirds' bycatch in smaller vessels? Any thoughts on this system? Feedback from the small vessel sector about implementation? Is it helping collect bycatch information? ▪ Updates on the use of use bycatch mitigation measures on longline fisheries (e.g. tori lines, night settings, acoustic devices) for gillnetters (e.g. pingers trials, actual deployment, other) and for trawlers (escape panels, excluder devices, bobbins, rock hoppers) or equivalent practices? To what extent are such bycatch reduction devices / practices used in these fisheries? Updates? ▪ Any other changes or updates of mention for the 7 fisheries in question that may relate to day to day operations and industry activities, management, research, assessment and advice, or mitigation of ecosystem effects of fisheries we should discuss?
<p>Date: 2nd November 2021</p> <p>Location: Remote, Video call</p>	<p>Icelandic Coast Guard: Björgólfur H. Ingason, Chief controller, Icelandic Coast Guard; Asgrimur L. Asgrimsson, Chief of Operations, Icelandic Coast Guard.</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Enforcement Laws and Regulations. In the past 12 months, have there been any significant amendments or changes to Icelandic fisheries laws / regulations with a bearing on enforcement activities? ▪ Has the level of resources and monitoring effort remained similar/changed in past 1-2 years? ▪ Have there been changes over the 2020/2021 season in the systems or patrolling vessels/assets used for enforcement (i.e. new vessels or other)? ▪ How many airborne fisheries patrol hours have been conducted over the last fishing season? ▪ Any other updates regarding enforcement assets (e.g. drones)? Use other electronic reporting systems? ▪ Boardings rate and type/ number of violations recorded (most recent year/season)? What are the most commonly occurring violations? Is enforcement data available by gear type or fishery (i.e. for cod, haddock, saithe, golden redfish, ling, tusk, herring under assessment)? Foreign vessels boarded? <i>Could you please provide us with tables/figures for this information as done in past years?</i> ▪ How many prosecutions and reprimands made against skippers did these activities (overall enforcement activities) result in? <i>Could you please provide us with tables/figures for this information as done in past years?</i> ▪ Are there many violations of fishermen fishing over their TAC? ▪ Enforcement of, and levels of compliance with, logbook reporting of interactions/bycatch between seabirds and marine mammal (especially in gillnets, longlines and trawl gear)? Is the new app in use in small vessels effective for catch recording? Updates and changes in the past 1-2 years? Any prosecutions for failing to report bycatch? ▪ Spotted wolffish can now be released after capture as per new 2020 regulation. Are fishermen reporting released vs retained spotted wolffish separately in the logbooks? ▪ Have there been any major changes in overall violation/compliance rate in the past 2-3 years? ▪ What is checked when vessels are boarded (gear specs, catch composition, logbook vs actual catches, other)? ▪ Reporting requirements and or issues with lost fishing gear (e.g. longline, gillnets)?

		<ul style="list-style-type: none"> ▪ Any changes to the range of monetary and operational penalties for infractions to fisheries regulations? ▪ Are there any repeating offenders in Icelandic waters? ▪ Any instances of serious IUU fishing by Icelandic or foreign vessels in the past 2-3 years? ▪
<p>Date: 2nd November 2021</p> <p>Location: Remote, Video call</p>	<p>Directorate of Fisheries/Fiskistofa: Erna Jónsdóttir, Head of Administration Division, Fiskistofa; Sævar Guðmundsson, Head of Department, Fiskistofa.</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Brief review or key highlights of the 2020/2021 fishing season for cod, haddock, saithe, golden redfish, ling, tusk and ISS herring. Any key issues or updates from a Fiskistofa perspective? Covid related changes? ▪ Any significant changes in the management system, key laws or regulations in the past 12 months? ▪ Any changes or updates of mention within Fiskistofa (e.g. staff) in the past 12 months? ▪ Any new or updated closed areas of mention (e.g. trawl or coral closures) within the Icelandic EEZ in the past 12-18 months? ▪ Has there been revisions in legislation and regulations? There was a mention previously that a revision process was ongoing. Is there any changes beyond editorial? Is there a good overview of changes? ▪ What rules are still in place for fishing outside the ordinary ITQ system (Hook and line, Byggðakvóti etc.) Status and essence of rules. ▪ Short term closures after re-organisation. How is it organised in practice, and how does it work now (number of closures by cause). How are they published? ▪ Redfish: Any plans for revision or renewal of the agreement between coastal states? ▪ Tusk: In recent years, about 30% of the catches in 5a are by foreigners. The TAC according to the HCR is allocated to Icelandic vessels. At present, total catch is close to recommended because Icelanders do not take their whole quota. Plans for a more permanent solution to this issue? ▪ Tusk: News about relation to Greenland? There was a warning in the last MFRI advice that catches from Greenland may have to be reconsidered in the assessment. ▪ Tusk: Tusk quotas spent on other species – is it possible to tell which? ▪ Haddock: There was added 8000t to the quota in 2020/21, from 45 389t to 53 389t and the plan was to subtract it next year. Apparently, 47,979 t were caught in the 2020/21 fishing year. What happens? ▪ Sampling of catches. Previously logistics has been mentioned as a problem – getting samples from landings far from the nearest observer. Is it still so? How about sampling from catches that are processed on board. ▪ How many days have directorate inspectors spent on board of fishing vessels in the last 2 fishing seasons for which information is available? What is the average inspector coverage % on bottom trawlers, longliners, gillnetters (cod if possible) and pelagic trawlers? Can the assessment team be provided with a table for 2020-2021, as done in previous audits? ▪ The short-term closure monitoring system was transferred to Fiskistofa in the fall of 2020. Regulation regarding the short-term closures was changed in 2020, and the size limit was increased for cod, which led to significant decrease in the number of closures.” How many closures have there been in 2020/2021 for each species in question? ▪ Monitoring of less valued species including elasmobranchs – is this something which has been started already? ▪ We discussed previously a report from the Icelandic National Audit Office (NAO) from 2018, noting that more quantitative data are needed to substantiate the conclusions that rate if discards are low and that there are few irregularities in connection with re-weighing of catches after de-icing in Iceland. In continuing to review actions implemented to improve some of the shortcomings identified in the report, what progress / updates have there been in the past 12 months?

		<ul style="list-style-type: none"> ▪ Act No. 57/1996 empowers the Fisheries Directorate to monitor all weighing by a weighing license holder for a period of up to six weeks in cases where monitoring of the weighing license holder by the Directorate detects a significant deviation of the percentage of ice in the vessel's catch in a particular fish species, compared to the average ice percentage for that vessel, has this measured been applied in 2020/21? Are there examples of this? ▪ Non-Conforming areas and Corrective Actions ▪ <u>Corrective Action relating to Non-Conformance 1</u> (applicable to all certified fisheries): <i>Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks. Regarding NC 1, are there updates, new information or developments addressing the issue?</i> ▪ Any recent updates relating to the smartphone app deployed to facilitate recording of marine mammal and seabirds' bycatch in smaller vessels? Any thoughts on this system? Feedback from fishermen? Is it helping collect bycatch information? Has the compliance of fishermen recording of such interactions improved? Do you see more reports of such non-fish species? ▪ <u>Corrective Action relating to Non-Conformance 2</u>: <i>There is insufficient evidence that adverse impacts of the cod, haddock and saithe fisheries on the following ecosystem components:</i> <ul style="list-style-type: none"> - <i>Spotted wolffish, and;</i> - <i>Common loon</i> <i>are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</i> Regarding Spotted wolffish: Has spotted wolffish been released in the past season? Catches in 2020/2021 were 1,300 t against a TAC of 314 t. Can we confirm if the excess catch (over the TAC) has been released alive and where is that recorded (the Fiskistofa website only reports total catch but we don't see releases https://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/) ▪ According to section 2 of Act no. 57/1996, concerning the treatment of commercial marine stocks, discard of catches is prohibited. However, minor exceptions include: a) Non-value catches and b) Heads and other refuse from working or processing. What species or species groups are considered non value catches? ▪ Collaboration between the Coast Guard and Fiskistofa relating to fisheries monitoring and enforcement activities. Updates for the past 12-18 months? ▪ Updates on the use of use bycatch mitigation measures on longline fisheries (e.g. tori lines, night settings, acoustic devices) for gillnetters (e.g. pingers trials, actual deployment, other) and for trawlers (escape panels, excluder devices, bobbins, rock hoppers) or equivalent practices? To what extent are such bycatch reduction devices / practices used in these fisheries? Updates? ▪ Any other changes or updates of mention for the 7 fisheries in question that may relate to day to day operations and monitoring activities, from a Fiskistofa perspective that we should discuss? ▪ AOB
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<p>Date: 04th November 2021</p> <p>Location: Remote, Video call</p>	<p>Marine and Freshwater Research Institute (MFRI):</p> <p>Gudmundur Thordarson, Head of Demersal Division, MFRI;</p> <p>Bjarki Elvarsson, Senior Scientist, MFRI.</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Cod 2021 benchmark / SSB downward and F upward revision. ▪ Cod: News about stock diversity and metapopulation ideas? ▪ Cod: Revision of assessment method etc. Points you want to highlight? More revisions to come? ▪ Cod: Is the catch stabilizer still used if SSB < SSBtrigger? According to the evaluation report (WKICECOD) it is not, but in all official statements it always applies. ▪ Benchmarks and revisions of management plans. What are the plans now 'after' the pandemic? Herring and redfish in particular. ▪ Tusk: Retro problem – further understanding? ▪ Ling. The historical retro in both the ICES and MFRI advise shows a quite large downward adjustment of biomass and upwards revision of mortality. The analytic retro looks much nicer. How come? ▪ Saithe: Why has the fishing area shifted (SW - NW)? - Fleet behavior or stock change? ▪ Herring: How confident are you that there is a strong year class coming in? ▪ Herring: Have you sufficient understanding of the retro-problems in the past to be able to take action if that becomes a problem again. ▪ Redfish: Recruitment failure – thoughts about why? ▪ Discards – new studies? Plans for alternative approaches?? ▪ Transfer of quotas between years and between species: Are there thoughts about how to balance practicality with precautionary approach? Better ways to protect vulnerable species? Plans to amend the rules? ▪ Non Conformances (NCs): 2 NCs were identified in previous IRF Full Assessments or carried over from the 4th Surveillance cycle in 2018. ▪ Non Conformance 1: <i>Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks.</i> ▪ Regarding NC 1, what are the updates and developments addressing the issue for 2021? ▪ Any recent updates relating to the smartphone app deployed to facilitate recording of marine mammal and seabirds' bycatch in smaller vessels? Any thoughts on this system? Feedback from fishermen? Is it helping collect bycatch information? ▪ Non Conformance 2: <i>There is insufficient evidence that adverse impacts of the cod, haddock and saithe fisheries on the following ecosystem components: Spotted wolffish, and; Common loon are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</i> ▪ Regarding NC 2, what are the key developments regarding spotted wolffish (e.g. relating to research activities and/or live releases in the fishery)? In the last audit a potential recovery plan was discussed, as well as age reading and survival experiments in Icelandic waters. What are the updates? Has spotted wolffish been released in the past season? Catches in 2020/2021 were 1,300 t against a TAC of 314 t. Can we confirm if the excess catch (over the TAC) has been released alive and where is there a record of it (the Fiskistofa website only reports total catch https://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/)? ▪ Furthermore, are there any updates relating to common loon in terms of population research or bycatch information? ▪ Recent known interactions between the fisheries under assessment and the following: basking sharks and leafscale gulper sharks? ▪ Can the assessment team be provided with total catch in numbers of Grey skate (<i>Dipturus flossada / batis</i>) for the latest available MFRI survey? Any additional updates on the state of this endangered species / complex? ▪ What survey abundance or status updates can be provided regarding vulnerable/ETP species: 1) dogfish, 2) Greenland shark and 3) porbeagle shark? ▪ Have there been any recent interactions with Blue whales and Northern right whales for the fisheries under assessment?
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		<ul style="list-style-type: none"> ▪ Updates on the use of use bycatch mitigation measures on longline fisheries (e.g. tori lines, night settings, acoustic devices) for gillnetters (e.g. pingers trials, actual deployment, other) and for trawlers (escape panels, excluder devices, bobbins, rock hoppers) or equivalent practices? To what extent are such bycatch reduction devices / practices used in these fisheries? ▪ Harbour porpoise updates in Iceland (e.g. surveys), status and management? ▪ Do you have updated bycatch information in Icelandic fisheries (e.g. cod gillnets, lumpfish nets, other gear) of harbour porpoise, harbour seals, grey seals, harp, ringed, hooded and bearded seals for 2020-2021? (we already have data you provided at the previous audit for 2016-2019) ▪ Do you have updated bycatch information in Icelandic fisheries (e.g. cod gillnets, lumpfish nets, longliners, purse seiners) relating to seabird bycatch for 2020-2021? (we already have data you provided at the previous audit for 2016-2019) ▪ Any updated MFRI or other reports on the by-catch of seabirds and marine mammals in Icelandic fisheries (not specifically relating to lumpfish)? ▪ Coral areas. Any research updates or new closures (proposed or implemented) in the past 12-18 months? ▪ Bycatch of deep water sponges are recorded during bi-annual groundfish surveys allowing managers to estimate the distribution of mass sponge occurrences. Any research updates? Any updates on management measures specific to conservation of sponge communities? ▪ Hydrothermal vents. Any research updates or new closures in the past 12-18 months? ▪ Mapping the distribution of benthic assemblages and habitats which are considered to be sensitive to trawling disturbances. Such information was deemed important in order to predict which species and habitats are at risk of being damaged by fishing activities and for the protection of important marine habitats in the future. Since the publication of the Vulnerable Marine Ecosystem NovasArc report in 2019 have there been additional research activities or plans to reflect and address the findings of the report? ▪ Any new studies, papers or reports on the Icelandic marine ecosystem's structure or foodweb dynamics?
<p>Date: 05th of November 2021</p> <p>Location: Remote, Video Call</p>	<p>The Client (closing meeting): Kristján Þórarinnsson, Fisheries Iceland; Finnur Gardarsson, IRF Foundation.</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Summary of findings from the week's meetings. ▪ Corrective actions for active non-conformances, updates, clarifications and discussions. ▪ Reporting timelines and next steps in the audit process. ▪ Questions and answers.

7 Summary Findings

7.1 Relevant changes to Legislation/Regulations and the Management Regime

Fisheries legislation

Iceland has an established Marine Policy and a structured management system¹ covering all commercial species, including herring². There is a principal Act (*last amendment No 116/2006*)³ and a number of supporting Acts and Regulations for the management of the fishery.⁴ Article 1 in the principal act states the overall objective for Icelandic fisheries management: *The exploitable marine stocks of the Icelandic fishing banks are the common property of the Icelandic nation. The objective of this Act is to promote their conservation and efficient utilisation, thereby ensuring stable employment and settlement throughout Iceland.*

Institutions

There are a number of inter-related government agencies within the system under the direction of the Ministry of Industries and Innovation which has ultimate responsibility. The Ministry of Industries and Innovation⁵ in Iceland is the principal management organization responsible for Icelandic fisheries and has the ultimate responsibility for fisheries management. They act according to law issued by the parliament (Alþingi), and according to advice from the Marine and Freshwater Research Institute (MFRI). The executive body is the Fisheries Directorate (Fiskistofa)⁶, which is responsible for the implementation of Fishery Regulations on behalf of the Ministry. Key functions of the Directorate of Fisheries include: Implementation of regulations, collection and collation of fishery catch data, managing and policing the Icelandic ITQ system and supporting research, survey work and Coastguard surveillance activities. The Icelandic Coast Guard⁷ is responsible for control at sea, both of the catches and the quality of the vessels. It performs sea and air patrols and monitoring of fishing within the Icelandic zone. It also operates the Icelandic Maritime Traffic Service within its operations centre which has a key role in ensuring safety at sea, but can also take action if the behaviour of a fishing vessels is unusual. The Marine and Freshwater Research Institute (MFRI)⁸ conducts a wide range of marine research and provides the Ministry with scientific advice. MFRI has wide international cooperation in all major fields of marine science, as indicated by its publication record⁹.

TAC and ITQ system

Limiting the total annual catch of herring is achieved primarily by an annual TAC. The TAC is set by the Ministry taking advice from MFRI, which is responsible for collecting and analysing scientific data on the stock. Management also includes fora for consultation with stakeholders.

The MFRI advice is based on calculations done within the framework of ICES (The International Council for Exploration of the Sea) by the ICES North-Western Working Group, (NWWG)¹⁰ according to standards approved

1 <http://www.fiskistofa.is/english/fisheries-management/>

2 <https://www.government.is/topics/business-and-industry/fisheries-in-iceland/>
[and](https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/)

3 <https://www.althingi.is/lagas/nuna/2006116.html>

4 <https://simplebooklet.com/stjrnfiskveia20212022lgogreglugerir>

5 <http://eng.atvinnuvegaraduneyti.is/>

6 <http://www.fiskistofa.is/english>

7 <http://www.lhg.is/english>

8 <https://www.hafogvatn.is>

9 <https://www.hafogvatn.is/is/midlun/utgafa/ritaskra>

10

<https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Gr>

by ICES in regular benchmark assessments¹¹. ICES provides advice, which normally, but not necessarily is followed by MFRI and subsequently by the Ministry. The ministry also seeks advice from ICES on management plans.

In 2020, because of the ongoing Covid 19 epidemic, the advice was made by MFRI according to the management plan, following ICES standards, based on an assessment performed by MFRI, without involving ICES. In 2021, the normal procedure was resumed.

There is a management plan in place for most commercial stocks in Iceland, including herring, with a general objective stated as: *The management strategy for Icelandic fish stocks, in general, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term.*¹² When harvest rules have been established in a management plan, as for herring, the Ministry recognizes an obligation to set the TAC accordingly. The current management plan for herring was introduced in 2017 after having been examined and approved by ICES.¹³ The plan is publicly available¹⁴.

The total annual TAC is distributed on vessels as individual transferable quotas (ITQ), managed by the Directorate. The ITQ system has evolved gradually in Icelandic fisheries management and was fully implemented in 1990. The legal basis for the ITQ system is the principal fisheries management act (116/2006)¹⁵. The main elements are:

- 1 Each vessel is assigned a quota share (%) in each stock, initially based primarily on catch history over a reference period.
- 2 The annual allowable catch for each vessel from each stock is obtained by multiplying the TAC of the year and the vessel's quota share (as a proportion).

Quotas can be transferred between vessels; this applies both to quota shares and annual catch allotments. For most stocks, including herring, Quotas can also be transferred between years and between species, within limits. Transfer between species is not an issue in the pelagic sector.

Control of landings

All fish that is caught (with very few exceptions) has to be landed and the landings have to take place in authorized ports and weighed by authorized weighers. These landings are reported to the Directorate and are the primary source of catch data. All landings have to be accounted against a quota. If the vessel does not have a quota for a landing, it has to buy one, and there is an efficient market for buying and selling quotas. To reduce the incentive for high-grading, undersized fish that is caught has to be sold. Only part of the catch is subtracted from the quota. The fisher gets a strongly reduced price and the surplus goes to a fund to promote scientific work of the MFRI.

General fishing permits are of two types, a general fishing permit with a catch quota and a general fishing permit with a hook-and-line catch quota. In addition, parts of the total TAC is set aside for special purposes (for example

[oup/2019/NWWG_publication%20with%20multiple%20files/NWWG%202019_11%20Herring%20in%205a_%20Icelandic%20summer%20spawning%20herring.pdf](#)

11

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/wkicemse_2017.pdf

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12 <https://www.government.is/topics/business-and-industry/fisheries-in-iceland/>

13 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/Iceland.2017.09.pdf

14 <https://www.government.is/topics/business-and-industry/fisheries-in-iceland/>

15 <https://www.althingi.is/lagas/nuna/2006116.html>

Strandveidar¹⁶, Bygdakvoti¹⁷), mostly to support local communities and small scale fisheries.

Log books are compulsory, and recently, only electronic logbooks (or mobile phone apps) are accepted¹⁸. The fishing year in Iceland runs from 1st September - 31st August. For herring, the season ends 31st May.

Protective measures

These include area closures (temporary and permanent) and gear restrictions. Most of them are directed towards demersal fish rather than herring, including an extensive system of areal closures that are to a large extent, but not exclusively, is designed to avoid exploitation of cod at the spawning grounds in the spawning season and to avoid catching juvenile fish. The Fisheries Directorate has recently launched a new map service (Hafsja) that shows closed areas with ample supplementary information.¹⁹

The fishery of the summer-spawning herring is specifically regulated by regulations set by the Icelandic Ministry²⁰. According to this regulation, this fishery can only take place from 1st September to 31st May with nets, purse seines and mid-water trawls. Mid-water trawling is only allowed outside of the 12 nautical miles zones with some additional area restrictions. Use of sorting grids in the mid-water trawls can be required in some areas, if necessary to avoid by-catch. When gillnets are used in the herring fishery, the minimum mesh size (stretched) is 63 mm. At present, the fishery is largely outside the 12 mile border, so the catches are taken by trawl. In other periods, most catches have been taken inshore, with purse seine. Normally, the age of first recruitment to the fishery is age-3, which is fish at length around 26–29 cm.

International cooperation and review

Normally, the assessment is conducted by the ICES North-Western Working Group, where stakeholder nations participate. In 2020, because of the ongoing Covid 19 epidemic, Iceland skipped participation in NWWG. In 2021, normal practise was resumed. The harvest rule in the current management plan was evaluated and approved by ICES in 2017²¹. A new benchmark process is planned for 2023.

Iceland has broad international scientific cooperation through organisations such as [the Northeast Atlantic Fisheries Commission](#) (NEAFC)²², [the Northwest Atlantic Fisheries Organization](#) (NAFO)²³, and [the North Atlantic Marine Mammal Commission](#) (NAMMCO)²⁴. Icelandic scientists have been involved in many international projects arranged by these organizations and in co-operative projects with research institutes and universities.

The Icelandic summer spawning herring is considered to be a local Icelandic stock and not a migratory or straddling stock. In the summer, also herring of the Norwegian spring spawning stock occurs in Icelandic waters. It is reported and managed separately.

16 <https://www.fiskistofa.is/fiskveidistjorn/umfiskveidistjornunarkerfid/strandveidar/>

17 <https://www.fiskistofa.is/veidar/aflaheimildir/bygdakvoti/>

18 <https://www.fiskistofa.is/fiskveidistjorn/afladagbaekur/>

19 <http://atlas.lmi.is/mapview/?application=haf>

20 Regulation 962/2019: <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662>

21

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/wkicemse_2017.pdf

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22 <http://www.neafc.org/>

23 <http://www.nafo.int/>

24 <http://www.nammco.no/>

7.2 Stock status update

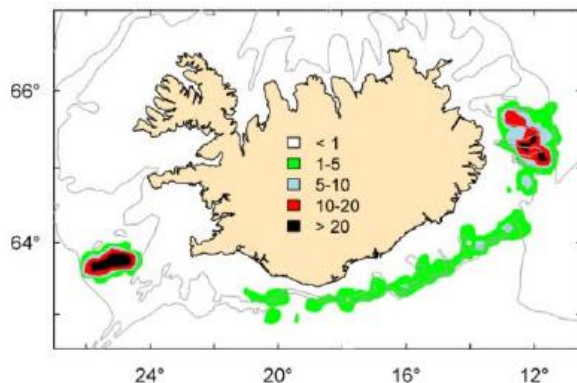
Assessment method

The method for assessing the abundance and exploitation of the Iceland summer spawning herring is the NFT Adapt from the NOAA assessment toolbox. It was approved for assessing the herring by ICES in a benchmark process in 2011²⁵ and has been used consistently since then. Other methods have been applied in parallel for control, recently it was a separable model. The models give very similar results.

Assessment data.

The assessment tool operates on the commercial catches disaggregated by age, and an acoustic survey index, and accounts for additional mortality caused by the pathogen *Ichthyophonus hoferi*.

Catches in number at age are from catch data that at present are collected at sea by fishermen, according to regulations²⁶. The calculation is done in strata confined by season and area and with two different age-length keys and weight at length relations based on season. The present geographical location of the fishery is shown below. Catches of Norwegian Spring Spawning herring that occur occasionally in the summer season in the East are reported separately – the split is done by inspection of gonads, which is regarded as a simple and safe procedure.



Síld. Veiðisvæði á fiskveiðiárinu 2020/2021 (t/sjm²)

Herring. Fishing grounds in fishing season 2020/2021 (t/nmi²)

Figure 1. Herring fishing grounds 2020/2021.

The herring stock is measured in an acoustic survey. The survey area and timing is adaptive, according to the distribution of the herring. In the herring surveys in winter of 2020/21, herring was measured west of the country in the end of March 2021, and east, southeast, and south of the country in November 2020 (Figure 2). The survey areas and timing are adaptive and vary from year to year, but intends to cover the whole stock over the year. In addition to getting an acoustic estimate, the objective was also to get an estimate of the prevalence of the *Ichthyophonus* infection in the stock.

²⁵https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2011/WKBENCH%202011/WKBENCH_2011.pdf

²⁶ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662>

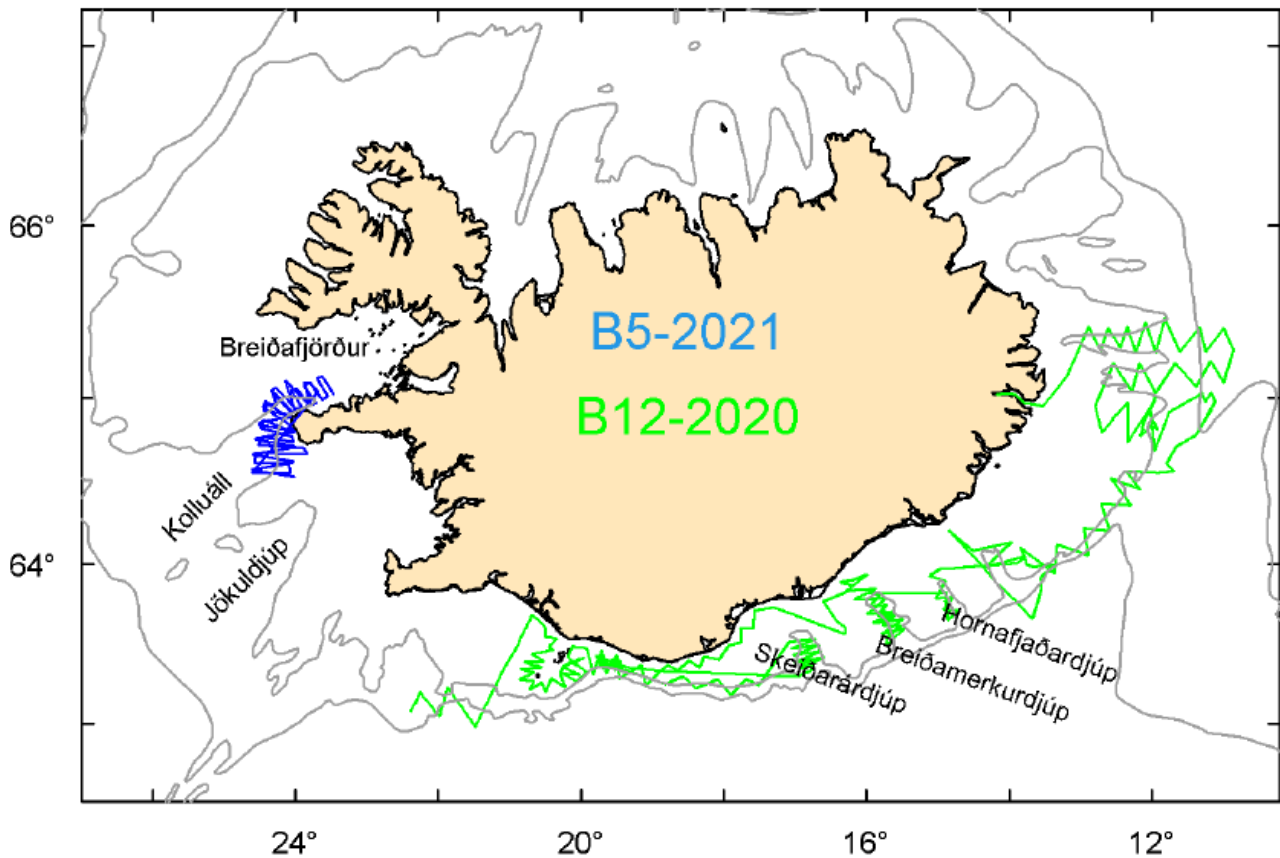


Figure 2. The survey tracks of two acoustic surveys in the east, southeast and south (B12-2020; green) and in the west (B5- 2021; blue).

There has been infection by *Ichthyophonus hoferi* in the stock since 2008, causing increased natural mortality. The increased mortality is calculated from the prevalence of *Ichthyophonus* assuming a 30% annual mortality of infected herring (Óskarsson et al. 2018a)²⁷ which is added to the natural mortality ($M=0.1$) for each age group each year ($M_{age, year} = 0.1 + M_{infected} \times 0.3$). The annual estimates are shown in the table below.

27 Óskarsson, G.J., Pálsson, J., and Gudmundsdottir, A. 2018. An ichthyophoniasis epizootic in Atlantic herring in marine waters around Iceland. *Can. J. Fish. Aquat. Sci.*. <https://cdnsciencepub.com/doi/10.1139/cjfas-2017-0219>

Table 5. Annual estimates of natural mortality at age, taking into account the effect of ichthyophonous infection.

Year\age	3	4	5	6	7	8	9	10	11	12	13	14	15	13+
1987–2008	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
2009*	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
2010*	0.29	0.29	0.28	0.26	0.25	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
2011*	0.13	0.26	0.26	0.25	0.23	0.24	0.25	0.24	0.20	0.21	0.21	0.21	0.21	0.21
2012-2016	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
2017	0.111	0.118	0.124	0.173	0.175	0.175	0.207	0.187	0.256	0.279	0.210	0.180	0.191	0.183
2018	0.116	0.112	0.172	0.162	0.175	0.228	0.226	0.247	0.275	0.338	0.307	0.184	0.186	0.250
2019**	0.111	0.135	0.144	0.168	0.216	0.169	0.171	0.183	0.245	0.189	0.243	0.182	0.140	0.189
2020***	0.119	0.146	0.122	0.155	0.191	0.164	0.193	0.159	0.230	0.100	0.146	0.151	0.100	0.275

* Based on prevalence of infection estimates and acoustic measurements ($M_{infected}$ multiplied by 0.3 and added to 0.1; Óskarsson *et al.* 2018).

** Based on prevalence of infection estimates in the winter 2019/20 and 2020/21 (multiplied by 0.3 and added to 0.1; Óskarsson and Pálsson, 2018).

*** Based on prevalence of infection estimates in the winter 2020/21 (multiplied by 0.3 and added to 0.1) and should be applied in the prognosis in the 2021 assessment.

Assessment performance

The main sources of uncertainty appear to be the estimates of natural mortality, and possible variations in survey catchability due to variable locations of the herring. The latter is a likely cause of the cluster of positive survey residuals in the years after 2000. (Figure 3). Previously, the assessment has had considerable bias and has been quite unstable. In the period after 2000 the assessment was rejected by ICES for several years, due to instability. At the time, there was a mismatch between survey results and catches. Even when a strong year class is coming in now, the problem is not expected to reappear²⁸. Figure 5 gives an indication of the problem. The assessment is now rather consistent from year to year, (Figure 4) and also similar to the results with a separable assessment model (Muppet).

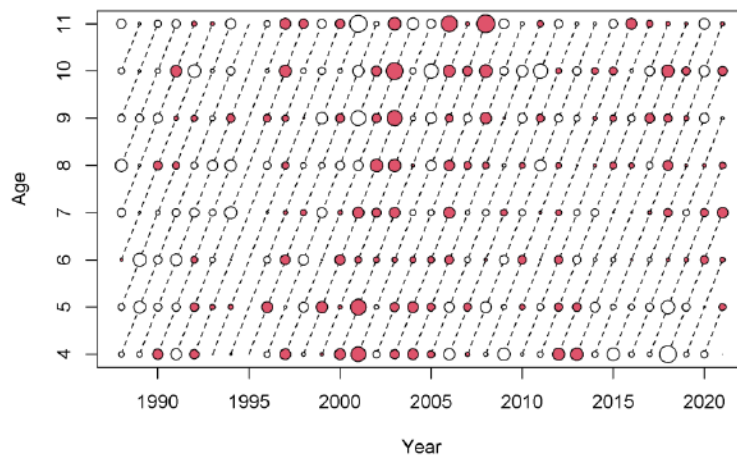


Figure 3. Icelandic summer spawning herring. Residuals of NFT-Adapt run in 2021 from survey observations (moved to January). Filled bubbles are positive (i.e. survey estimates higher than the assessment) and open

28 Communicated by MFRI at web-meeting 4 Nov. 2021.

negative. Max bubble 1.73.

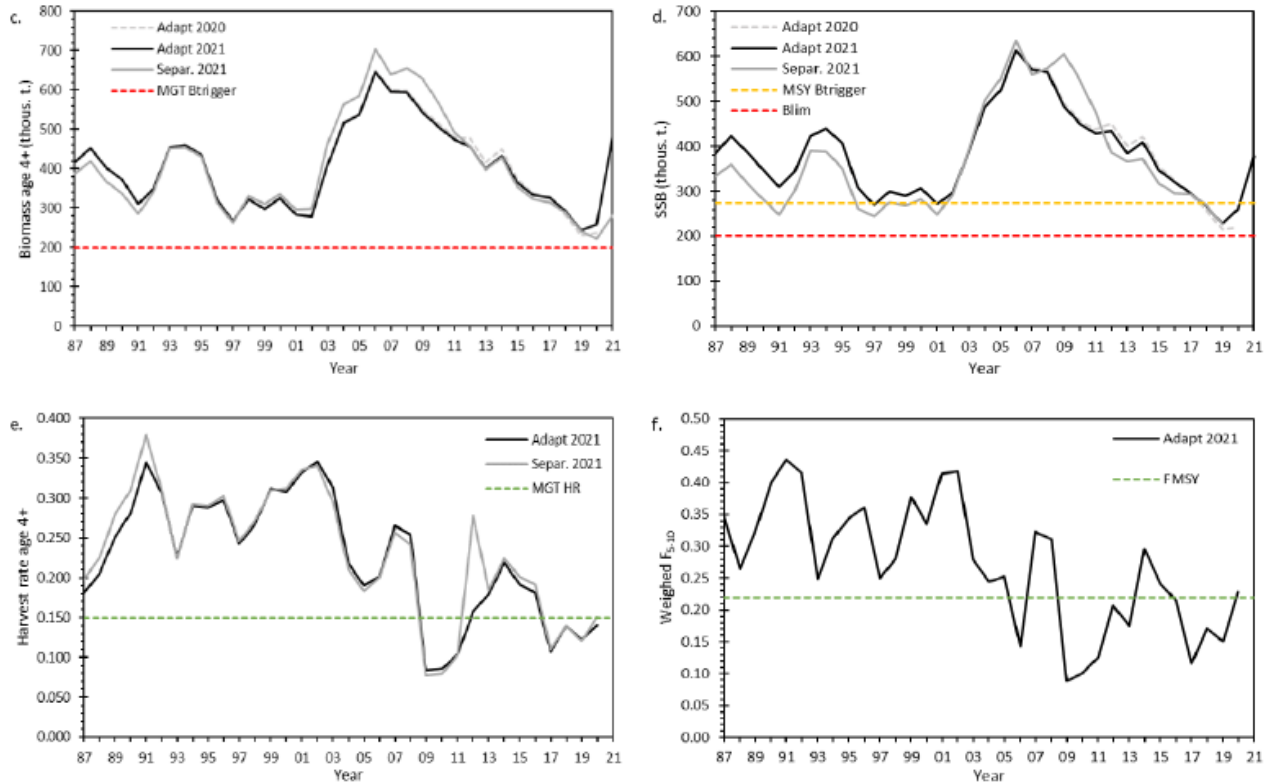


Figure 4. Comparisons of the final NFT-Adapt run in 2021, NFT-Adapt run in 2020 and a run from a separable model (Muppet) in 2021. Some reference points are also shown. The high harvest rate estimate with the separable model in 2012 is due to including a mass mortality in Kolgrafafjörður in the winter 2012/13 in the harvest rate (e) for Muppet but not in Adapt run 2021.

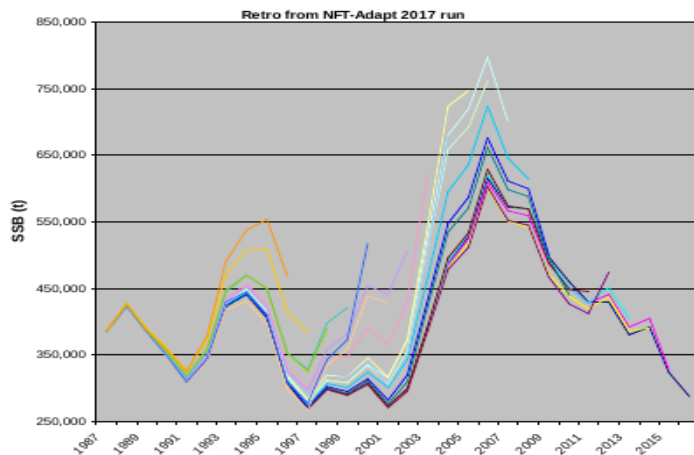


Figure 5. Retrospective analysis (SSB) over the period 1987 – 2017 with the current method. From WKICEMSE 2017²⁹.

Assessment results

The main results of the assessment are shown in below from the 2021 MFRI assessment³⁰. They are consistent with the results last year. There was a period with strong year classes from about 2000 onwards, leading to a wave in SSB that peaked in 2006. Subsequently, the recruitment has declined gradually, as has the SSB. There is indications (first from survey data, but now followed over 3 years) of a strong incoming year class in 2020 (2017 year class), which is also lifting the SSB as it enters the spawning stock. The harvest rate and the fishing mortality have both been fairly stable for some years, and are at present slightly below the target value.

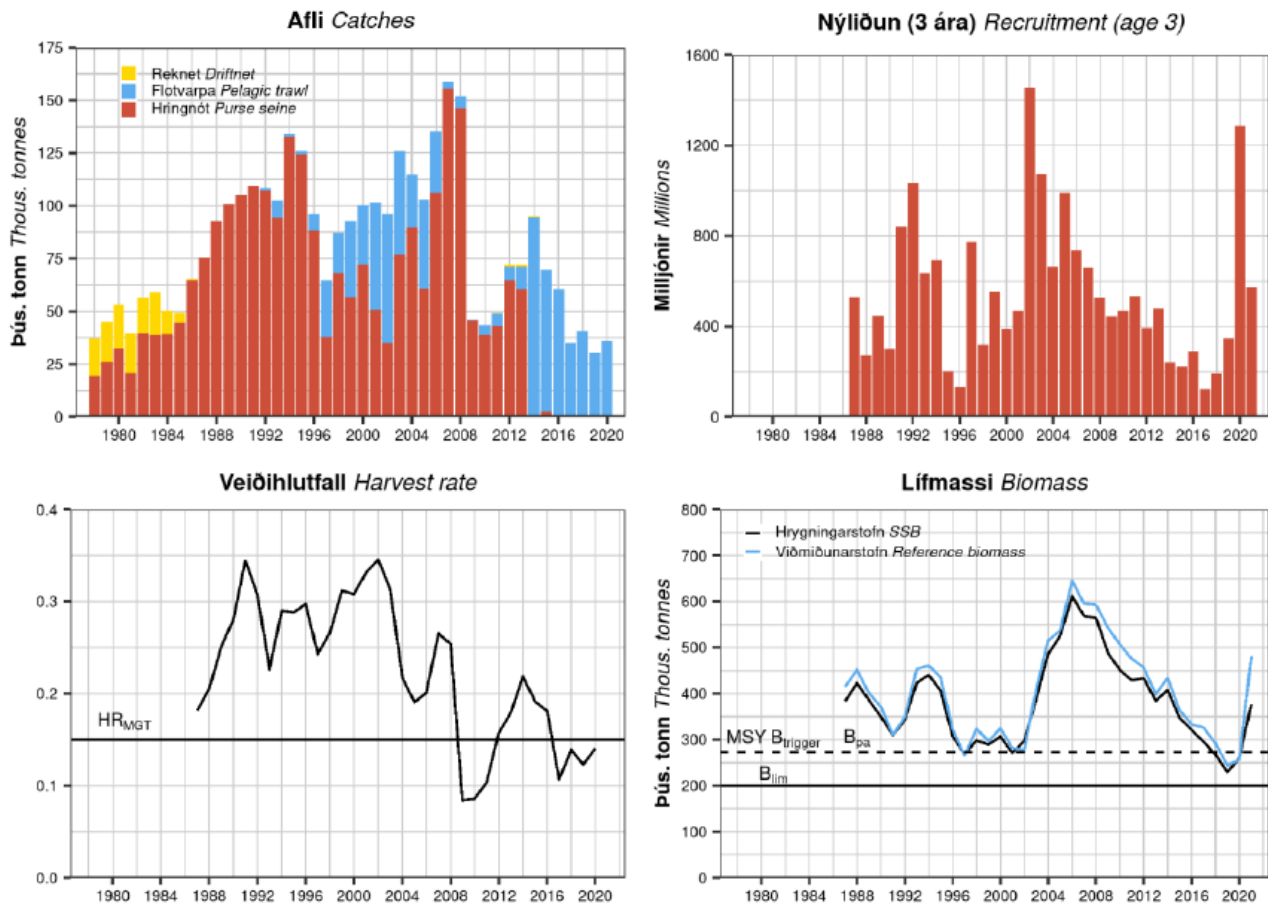


Figure 6. Catch by gear type, recruitment, harvest rate based on reference stock biomass, reference stock biomass (B4+) and spawning stock biomass (SSB).

Reference points and harvest rule

²⁹

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/wkicemse_2017.pdf

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³⁰ <https://www.hafogvatn.is/static/extras/images/22-herring1259461.pdf>

The present reference points were set in by NWWG in 2016³¹ and at a harvest rule evaluation in 2017³², where also the assessment method and the harvest rule were revised and approved.

Since this stock has been through a stock collapse in the past, there is ample observations to determine a stock – recruit relationship (Figure. 7)

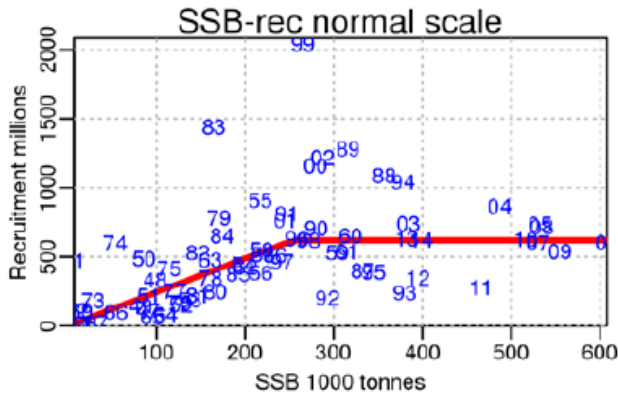


Figure 7. Stock-recruit relationship and historical stock-recruit pairs as used in harvest rule simulations.

The reference points for the herring stock have evolved over many years, and the attitude has been to keep values that have worked well over long time. A limit SSB of 200 000 tonnes has been in place for decades, and although the estimated breakpoint in the stock – recruit relation in the last evaluation was higher, it was considered reasonable to keep the old value. Other reference points were set according to the ICES guidelines valid at that time: Bpa was set at the 95-percentile of Blim, ($Bpa = Blim \times e^{1.645\sigma} = 273 \text{ kt}$, where an assessment error with $\sigma = 0.19$ was assumed). Flim = 0.61 was set as the F leading to Blim with mean recruitment, and Fpa= 0.43 was set at $Flim \times \exp(-1.645 \times \sigma)$, where $\sigma = 0.18$.

The FMSY was set at 0.22. Historically, a target exploitation rate of $F_{0.1} = 0.22$ proved successful in managing the stock for about 30 years, despite biased assessments. At the revision in 2016 it was concluded that $F_{0.1} = 0.22$ could be valid as FMSY. During a harvest rule evaluation for the stock in 2017, $F = 0.22$ was not significantly different from results of simulation giving 0.24 as Fmax. Thus, it was concluded adequate to keep FMSY = 0.22. Simulations made at the 2017 harvest rule evaluation (see below) gave a HRMSY = 0.19 when some assessment bias was included.

The reference points currently valid are tabulated below.

31

<https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2016/NWWG/13%20NWWG%20Report%20-%20Sec%202011%20Icelandic%20summer%20spawing%20herring.pdf>

32

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/wkicemse_2017.pdf

Nálgun <i>Framework</i>	Viðmiðunarmörk <i>Reference point</i>	Gildi <i>Value</i>	Grundvöllur <i>Basis</i>
Aflaregla <i>Management plan</i>	MGT B _{trigger}	200 000 t	Aðgerðarmörk í aflareglu sem standast MSY viðmið ICES <i>Trigger point in HCR considered consistent with ICES MSY framework</i>
	HR _{MGT}	0.15	Slembireikningar í aflaregluhermun. Hlutfall af viðmiðunarstofni <i>Stochastic HCR evaluation. Proportion of age 4+ biomass</i>
MSY	MSY B _{trigger}	273 000 t	B _{pa}
	F _{MSY}	0.22	Slembireikningar í aflaregluhermun. <i>Stochastic HCR evaluation</i>
Varúðarnálgun <i>Precautionary approach</i>	B _{lim}	200 000 t	Stærð hrygningarstofns þar sem líkur eru á skertri nýliðun <i>SSB beyond which recruitment becomes impaired</i>
	B _{pa}	273 000 t	$B_{lim} * e^{1.645\sigma}$, $\sigma = 0.19$
	F _{lim}	0.61	F sem leiðir til B _{lim} miðað við meðal nýliðun <i>F corresponding to B_{lim} with average recruitment</i>
	F _{pa}	0.45	$F_{pa} = F_{lim} \times \exp(-1,645 \times \sigma)$, $\sigma = 0.18$

Several alternative parameters for a management plans were tested at the last evaluation in 2017. Most of them were found to satisfy the criteria for precautionary management, and one of these was adopted by the Government of Iceland and has been applied since then. It has a target harvest rate of 15% of herring aged 4 years and older, and a trigger value for the SSB at 200 kt, below which the harvest rate is reduced.

The harvest rules were tested by simulation³³, using a software (named 'ADGISAHA at the time') It is similar to Muppet software that has been used recently for several demersal stocks. It is a separable model fitted to catch at age and survey indices, where the model can be projected forwards to provide harvest rule simulations. The assessment part is different from the ADAPT type used in the ordinary assessment, but it was demonstrated that the results were very similar. In addition to observed uncertainties in recruitment, growth and selection, the effect of an assessment bias of 15% and of increased natural mortality due to new outbreaks of Ichthyophonus disease was explored. The occurrence of both these in the future cannot be estimated from historical experience. The assumptions underlying the advice can regarded as a compromise between including everything that can go wrong and ignoring all obstacles. Hence, with some assessment bias (15%) but no increased mortality due to Ichthyophonus disease, the 5-percentile of SSB is at B_{lim} at a harvest rate of 0.2 (Figure 8). The adopted rule has a lower harvest rate of 0.15.

The official formulation³⁴ if the harvest rule is:

The management strategy for Icelandic summer-spawning herring is to maintain the exploitation rate at the rate which is consistent with the precautionary approach and that generates maximum sustainable yield (MSY) in the long term.

According to the Harvest Control Rule (HCR) the TAC for the fishing year $y/y+1$ (1 September of year Y to 31 August of year $y+1$) as 15% (HR_{MGT}) of the biomass of herring age 4 and older ($B_{Ref,y}$) in the assessment year (y) calculated as:

33

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/wkicemse_2017

.pdf

34

<https://www.government.is/topics/business-and-industry/fisheries-in-iceland/>

$$TAC_{y/y+1} = HRMGT * B_{Ref,y}$$

If the spawning stock biomass (SSB) falls below 200 000 tonnes (MGT Btrigger), the HCR dictates that harvest rate shall be reduced linearly to zero based on the ratio of the SSB estimated and MGT Btrigger, the TAC for the fishing year y/y+1 is then calculated as:

$$TAC_{y/y+1} = HRMGT * (SSB_y / MGT Btrigger) * B_{Ref,y}$$

The HCR has been evaluated by ICES and found to be consistent with the precautionary approach conforms to the ICES MSY approach.

In accordance with the general aims of the management strategy for summer-spawning herring the HCR was formally adopted by Icelandic authorities in June 2017 for the consecutive period of 5 fishing years, starting from the 2017/18 fishing year.

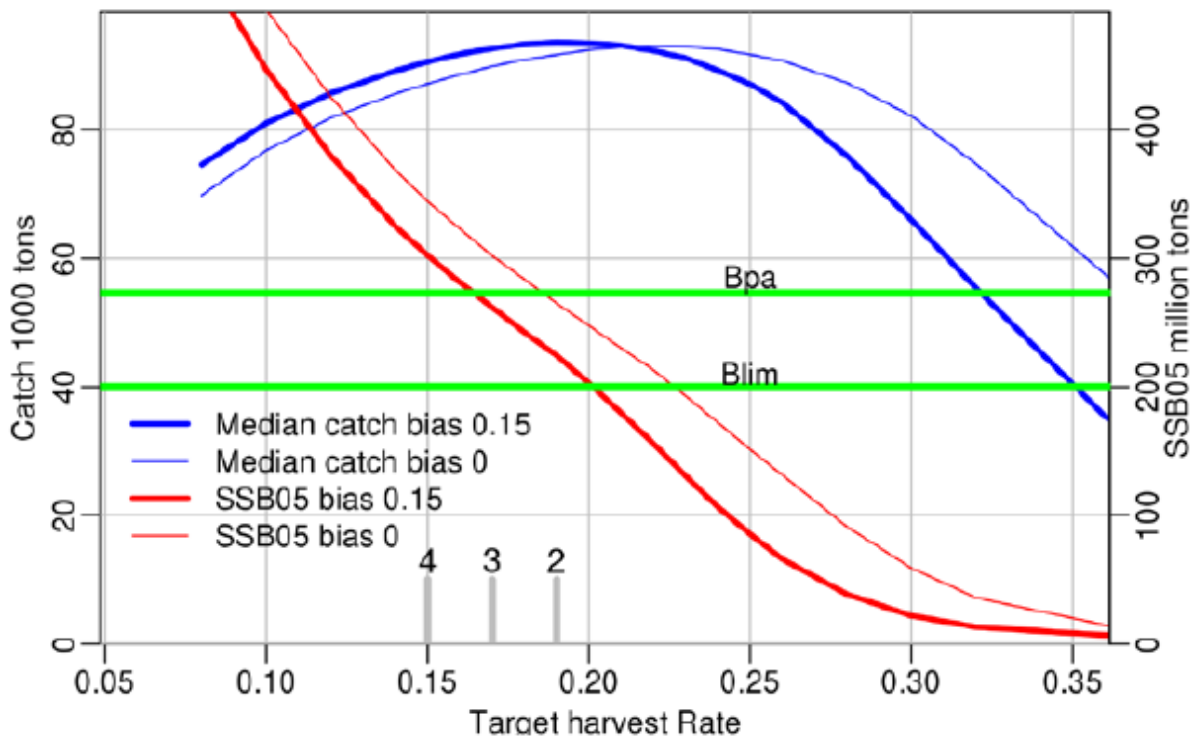


Figure 8. Median catch and fifth percentile of SSB at equilibrium (long term) for different harvest rates, with and without assuming 15% assessment bias. No increase in natural mortality from Ichthyophonous epidemics. Harvest rates corresponding HCRs 2, 3, and 4/5 (0.19, 0.17, and 0.15, respectively) are shown. HR = 0.19 maximizes the median catch when a 15% assessment bias is assumed. No Btrigger was applied.

Being a rule with a fixed target exploitation rate, a target SSB is redundant, and has not been defined.

Research results are made public in a timely and readily understood fashion

The assessment is normally done by the ICES North-Western Working Group (NWWG). Then ICES provides advice based on the results from NWWG. Once released, the advice and the NWWG report are available at the ICES website³⁵. MFRI provides its own assessment and advice, which for practical purposes normally does not deviate from that of ICES. In 2020, the MFRI advice was provided without an advice from ICES, but following the harvest rule approved by ICES. MFRI provides an overview of the state and the advice for all major Icelandic stocks on its website³⁶. The final advice to Icelandic authorities is provided by MFRI. The MFRI advice follows the advice for ICES when there is one unless there is good reasons to deviate from it.

7.3 Landings update

The fishery can take place from 1 September to 31 May each fishing season (1 September–31 August) in nets, purse seines and mid-water trawls. In addition, there are by-catches in the fisheries for Mackerel and Norwegian spring spawning herring, that extend throughout the summer and autumn. Mid-water trawling is only allowed outside of the 12 nautical miles zones with some additional areal restrictions. Spawning takes place in July off the SE, S and SW coast. The nursery grounds are mainly in coastal areas off the NW and N coast, but occasionally also in coastal areas off the E, SE, and SW and W Iceland. The overwintering grounds of the mature and fishable stock was mainly off the SE and E Iceland prior to 1998. From 1998 to 2006, the overwintering took place both off the east and west coast, with increasing proportion being in the western part. In the winters 2006/07 to 2011/12, most of the stock was located in high density in coastal waters in northern part of Breiðafjörður in western Iceland. Since then, it has moved to the shelf edge region in the West.

The location of the fishery has also varied over the years³⁷. In the seasons 2007/2008 to 2012/2013, the majority of the catch (~90%) was caught in Breiðafjörður, but before that it was mainly caught off the south, southeast and east coasts. Since 2014/2015, most of the fishing has taken place in the west of the country. In Breiðafjörður, the fishery was by purse seine as trawl is prohibited in inshore waters. The last years, when the fishery has moved to the Western shelf edge, the catches are exclusively by pelagic trawl (Figure below).

In addition to the traditional fishery in the winter and spring in the West, there are by-catches of summer spawning herring in the fishery for Norwegian Spring Spawning herring and in the mackerel fishery. Both take place in the South and East. In the 2020/2021 season, the total catch was 36 100 tonnes while the TAC was 35 490 tonnes. Traditional catches in wintering grounds west of the country in November-February accounted for 44% (15 800 tonnes), 56% (20 300 tonnes) were taken as bycatch in mackerel fishing in the south in June-July (3 400 tonnes) and in fishing for mackerel and Norwegian spring-spawning herring to the east in June-July (4 400 tonnes) and in September-November (12 500 tonnes).

35 <http://www.ices.dk>

36 <https://www.hafogvatn.is/is/veidiradgjof>

37 http://www.ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2019/her.27.5a_SA.pdf

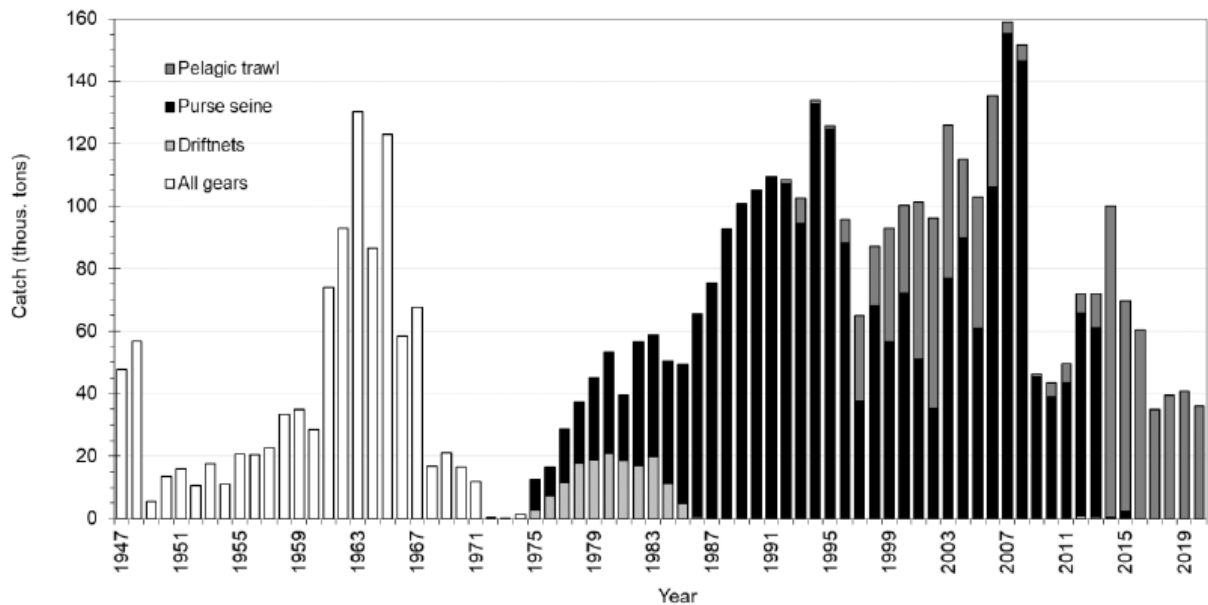


Figure 9. Icelandic summer-spawning herring. Seasonal total landings (in thousand tonnes) during 1947-2020, referring to autumns, by different fishing gears from 1975 onwards.

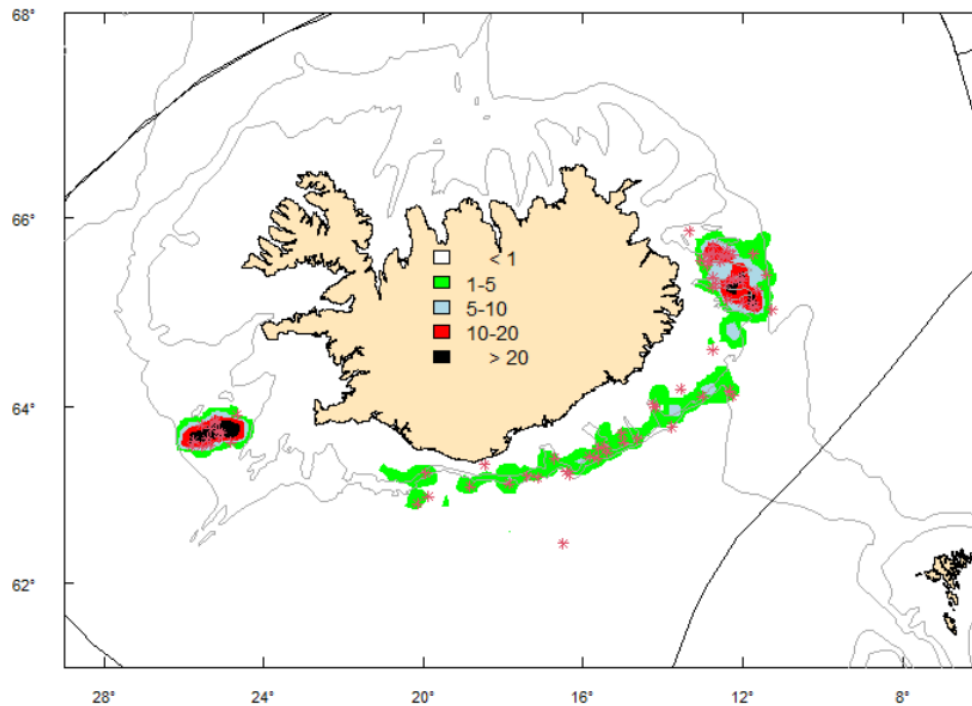


Figure 10. The distribution of the fishery (in tonnes) of Icelandic summer spawning herring during the fishing season 2020/21, including the bycatch in the mackerel fishery in July–November 2020. The stars indicate the location of catch samples.

Table 6. Quotas and catches of herring.

Fiskveiðíár <i>Fishing year</i>	Tillaga <i>Recommended TAC</i>	Aflamark <i>National TAC</i>	Afli <i>Catches</i>
2010/2011	40 000	40 000	43 533
2011/2012	40 000	45 000	49 446
2012/2013	67 000	68 500	71 976
2013/2014	87 000	87 000	72 058
2014/2015	83 000	83 200	94 975
2015/2016	71 000	71 000	69 729
2016/2017	63 000	63 000	60 403
2017/2018	38 712 ¹⁾	39 000	35 034
2018/2019	35 186 ¹⁾	35 186	40 683
2019/2020	34 572 ¹⁾	34 572	30 038
2020/2021	35 490 ¹⁾	35 490	36 100
2021/2022	72 239 ¹⁾		

¹⁾ 15% aflareгла. 15% *harvest control rule*.

To protect juvenile herring (27 cm and smaller) the mesh size in gillnets is 63 mm. Normally, the age of first recruitment to the fishery is age-3, which is fish at length around 26–29 cm.

In recent years, TACs have been set close to the advice and catches have been close to the TAC. Both have been stable around 30–40 000 tonnes since the 2017/2018 season. For the coming season, the recommendation is a higher TAC, as the stock is increasing due to better recruitment, in particular a strong 2017 year class which now enters the reference biomass at age 4.

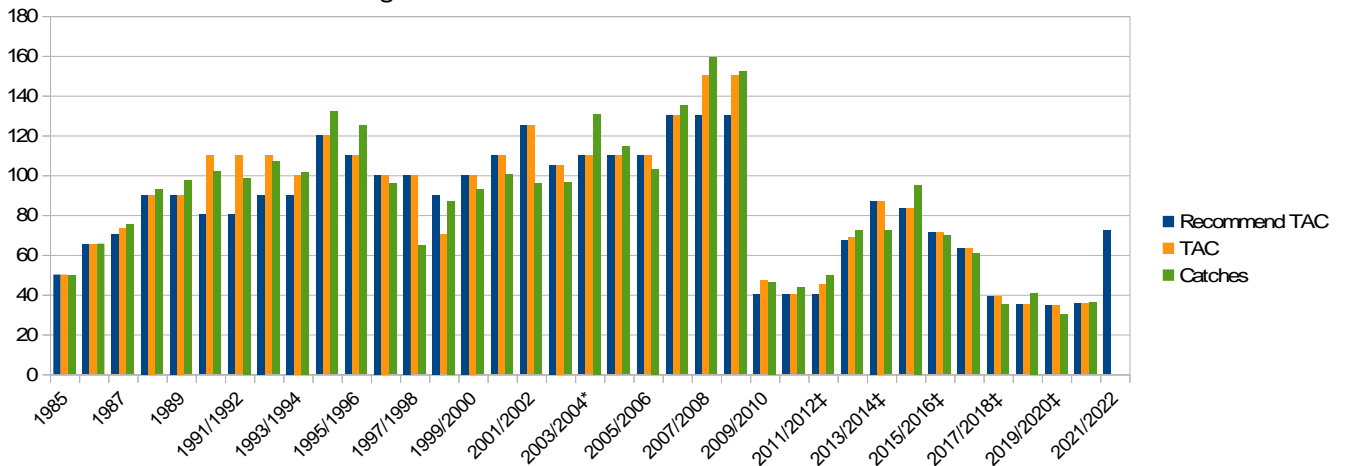


Figure 11. TACs and catches of Icelandic summer spawning herring.

7.4 Enforcement and Compliance update

The Icelandic Directorate of Fisheries is an independent administrative body responsible to the Fisheries Minister, responsible for the day to day implementation of the Act on Fisheries Management and related legislation, for day-to-day management of fisheries and for supervising the enforcement of fisheries management rules. More

specifically, the Directorate of Fisheries works in accordance with the following Acts, the Directorate of Fisheries Act (no. 36/1992)³⁸, the Fisheries Management Act (no. 116/2006)³⁹, the Act on Fishing in Iceland's Exclusive Economic Zone (no. 79/1997), the Act concerning the Treatment of Commercial Marine Fish Stocks (no. 57/1996) and the Act on a Special Fee for Illegal Marine Catch (no. 37/1992). Accordingly, it issues fishing permits to vessels and allocates catch quotas, imposes penalties for illegal catches, supervises the transfer of quotas and quota shares between fishing vessels, monitors vessels using the VMS system e-logbooks, controls the reporting of data on the landings of individual vessels and monitors the weighing of catches⁴⁰. It also provides supervision on board fishing vessels and in ports of landing (i.e. shore based monitoring), which involves inspecting the composition of catches, fishing equipment and handling methods. It works closely with the Icelandic Coast Guard, which carries out fisheries inspection at sea, monitors the EEZ and receives required notifications from vessels, Port Authorities and the MFRI. A full list of regulations which was harmonised and streamlined starting in 2019 is available on the Ministry's website⁴¹ (see also the digital booklet for the 2021-2022 regulations at https://vefbirting.prentmetoddi.is/raduneyti/stjorn_fiskveida_2020-21/94/).

The Fisheries Management Act sets out penalties for the violation of its provisions, or rules adopted by virtue of it, which are provided in detail in the Act Concerning the Treatment of Commercial Marine Fish Stocks (Act No. 57 1996⁴²). Provisions of the Act on a Special Fee for Illegal Marine Catch⁴³ are also applied as appropriate. Penalties range from the issue of reprimands by the Directorate of Fisheries and the suspension of commercial fishing permits to fines and, in cases of serious or repeated deliberate violation, imprisonment for up to six years (Article 24 and 25 of Act No. 116/2006).

Control of discarding of fish is provided for by the Treatment of Commercial Marine Stocks Act No. 57 1996, which prohibits discarding and fishing without sufficient quota. The Act requires the Directorate of Fisheries to monitor and publish information on catches of the fleet (Articles 2-3). Furthermore, the Act stipulates that all fish caught within the Icelandic EEZ, or during trips where a proportion of fishing activities take place in the EEZ, must be landed in an officially recognised port. Fiskistofa also performs check at sea to check for differences in catches of certain vessels when the Fiskistofa inspector is on board and when not, to detect discards. Some findings have been published in 2019⁴⁴ and 2020⁴⁵.

Within two hours of landing catches are officially separated, weighed and recorded by accredited weighing stations and reported against the appropriate quota allocation following provisions outlined in the Act No 57, 1996 concerning the Treatment of Commercial Stocks, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources⁴⁶.

The weight registration document for each vessel is transmitted to the Fisheries Directorate who record it on their Catch Registration System (the Fisheries Directorate and Landing Ports database GAFL). The Directorate also receives the e-logbook information. During the 2021 remote audit, Fiskistofa confirmed that starting in September

³⁸ <https://www.althingi.is/lagas/149a/1992036.html>

³⁹ <https://www.ecolex.org/details/legislation/fisheries-management-act-1990-lex-faoc003455/>

⁴⁰ <http://www.fiskistofa.is/english/about-the-directorate/>

⁴¹ <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2021/09/23/Stjorn-fiskveida-2021-2022-Log-og-reglugerdir/>

⁴² <https://www.althingi.is/lagas/149a/1996057.html>

⁴³ <https://www.althingi.is/lagas/149a/1992037.html>

⁴⁴ <http://www.fiskistofa.is/umfiskistofu/frettir/aflasamsetning-a-botnvorpu-og-dragnotarveidum>

⁴⁵ <http://www.fiskistofa.is/umfiskistofu/frettir/aflasamsetning-i-thorskanetum-og-botnvorpu>

⁴⁶ <https://www.stjornartidindi.is/Advert.aspx?RecordID=884be309-64a5-4367-9e4d-f5e7216b6f40>

2020 smaller Icelandic vessels are now required to log their catches in an App (essentially an e-logbook) which contains information on catch and bycatch, including that of marine mammals and seabirds. This follows regulation 298/2020⁴⁷. The App also called Afladagbókina or catch diary^{48 49} automatically records the location of the boat during fishing and the captains then records the catch, its condition and by-catch, in a very simple way. The app replaces paper logbooks in the small boat sector, with an electronic catch recording system.

Weighing is undertaken on official port scales certified by the Fisheries Directorate and operated by individuals authorised by the Directorate. In circumstances where there are significant difficulties in using a port scale, private weighing scales can be used provided the company involved has been approved by the port authority, the scales and operators using them are certified and Fisheries Directorate inspectors have unimpeded access to the facilities. This is known as a 'Home-weighing license'. Fish markets can also be authorised to weigh catches by the Directorate.

Processed at sea catch are registered as processed weights using an officially approved yield. This is monitored and verified by the Directorate staff. Weights at landing are checked at the processing base by Directorate staff. Processed weights are converted to live weight equivalents for deduction from each vessel's quota and management purposes by staff at the Directorate. Adjustments can be made by the Directorate to correct for errors – the system is transparent in so far that anyone can enter a vessel registration number on the Directorates website and obtain the catch, species, quota, remaining quota, quota rents for any vessel. The Directorate notes on the website that the information may be corrected by staff at later time post original posting of the information.

A December 2018 report from the Icelandic National Audit Office (NAO)⁵⁰ on certain aspects of the Icelandic enforcement system highlighted that more quantitative data are needed to substantiate the conclusions that discards are low and that there are few irregularities in connection with re-weighing of catches after de-icing. Although available evidence (e.g. data from scientific cruises held up against information reported by the vessels) still indicates that discards are low and re-weighing irregularities not significant, the Directorate of Fisheries has recently placed new staff to control re-weighing at processing plants at risk and has started to publish information on its website showing catch composition reported by fishing vessels on trips with and without an inspector on board, with a view to roll this out more widely to several fishing fleets in Iceland. During the 2021 remote audit, Fiskistofa confirmed that they worked on this issue by increasing surveillance. The results of this surveillance are published online to show the violations and deter other potential violators⁵¹.

As a result of this process new Regulation has been put in place which essentially places additional Fiskistofa surveillance at the operators cost, for those that do not comply. This is Regulation 990/2020⁵² on (7th) amendment to Regulation no. 745/2016, on weighing and registration of marine catch. Paragraph 3 Article 8 of the Regulation now reads as follows:

The weigher may deduct 12% when cooling with ice cream or 7% when cooling with an ice concentrate of unprocessed catch which is weighed on a weighbridge finished for export, directly into a transport vessel. The master shall ensure that refrigerant information is received at the port of landing before the catch is weighed and

⁴⁷ <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

⁴⁸ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

⁴⁹ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

⁵⁰ <https://rikisendurskodun.is/wp-content/uploads/2019/01/Eftirlit-Fiskistofu-Stjornsysluuttekst.pdf>

⁵¹ <http://www.fiskistofa.is/umfiskistofu/frettir/hlutfall-kaelimidils-mai-til-agust>

⁵² <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/22140>

recorded. If the Directorate of Fisheries' inspection reveals a significant deviation from the ice ratio in the vessel's catch, the vessel's catch shall be weighed in accordance with Article 11 for the next 8 weeks. If there are repeated significant deviations from the reported ice ratio in the vessel's catch, the vessel's catch shall be weighed in accordance with Article 11 the next 16 weeks.

Furthermore, Fiskistofa supervised re-weighing 81 times during the 2019/2020 fishing season. Also, in 2019, the Directorate of Fisheries began implementing ISO-31000 the standard intended for effective guidance on risk management for institutions and companies. This is being implemented in an effort to strengthening confidence in the Agency's oversight, and increase efficiency and transparency in the operations of the Directorate of Fisheries.⁵³

Acts/Laws and Regulations may be accessed by searching by Act/Law/Regulation No./Year (e.g. 116/2006) at <http://www.althingi.is/lagasafn/> (for Acts/Laws) or <https://www.reglugerd.is/> (for Regulations). In addition to their being easily accessible and searchable online laws and regulations are also effectively disseminated through an online law gazette which provides the most up to date versions of the legislation (i.e. incorporates latest amendments)⁵⁴.

The Fisheries Directorate website also prominently displays announcements relating to the management of the fishery including, for example, in relation to allocation of quota, opening and closure of fisheries, license revocations, reminders about legal requirements etc.⁵⁵

All scientific advice is available online⁵⁶. Harvest control rules are scrutinised on request by an independent scientific body (ICES) with reports being published online.

Up-to-date maps of fisheries closures are available on-line on the Fisheries Directorate website⁵⁷.

Temporary/sudden closures (generally 2 weeks triggered by high juvenile abundance on fishing grounds) are announced by the Coastguard on VHF radio on a specified wavelength and on the radio before the news and weather (Fisheries Directorate pers. com. site visit November 2021). They are also published on the MFRI website. The short-term closure monitoring (and issuing of) was transferred to Fiskistofa in the fall of 2020. Some regulation regarding the short-term closures was also changed in 2020, whereby the trigger size limit was increased for cod, which led to significant decrease in the number of closures. An updated table as provided by the management authorities (MFRI and Fiskistofa) is shown below.

Table 7. Short term closures in Iceland for the years 2018-2021.

Year	Species	Number of closures
2018	Cod	90
2018	Saithe	4
2018	Shrimp	2
2018	Haddock	1

⁵³ http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

⁵⁴ <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2021/09/23/Stjorn-fiskveida-2021-2022-Log-og-reglugerdir/>

⁵⁵ <http://www.fiskistofa.is/>

⁵⁶ <https://www.ices.dk/advice/Pages/Latest-Advice.aspx>

⁵⁷ <http://atlas.lmi.is/mapview/?application=haf>

2019	Cod	50
2019	Haddock	1
2020	Cod	9
2020	Haddock	1
2020	Greenland halibut	1
2021	Sea cucumber	2
2021	Cod	3
2021	Haddock	1

Directorate Inspections at Sea

Days spent by Fisheries Directorate inspectors at sea inspecting vessels is shown in the table below.

Table 8. Directorate inspector days on fishing vessels (Source: Directorate of Fisheries, November 2021 remote audit).

Season	Fishery type: Bottom Trawl	Fishery type: Longline	Fishery type: Gillnet	Other Gears (e.g. pelagic gears used to catch herring)?
2015/16 season days	553	Not Available	81 (60 days cod, 21 days lumpsucker)	Not Available
2016/17 season days	780	230	117 (60 days cod, 57 lumpsucker)	195
2017/2018 season days	570	202	154 (41-113)	156
2018/2019 season days	674	190	155 (59- 36- (Greenland halibut 60)	102
2019/2020 season days	468	92	85 (44-37-4)	127
2021/2021 season days*	315 (1.3% of trips)	2 (0.0% of trips)	0 specifically for cod	59 trips on pelagic trawls (3.4% of trips)

* This season was been heavily affected by Covid-19 restrictions and the Fiskistofa observers were limited by social distancing regulations in their capacity to board and inspect vessels.

7.4.1 Enforcement by Fiskistofa

The Directorate of Fisheries monitors compliance with laws and regulations which apply to fishing, handling of commercial stocks and treatment catch. In many cases, the Directorate of Fisheries is intended to respond to violations of laws and regulations through the application of administrative sanctions. Sanctions are intended to have a protective effect to reduce or prevent further violations. The main resources available to the Directorate of Fisheries for violations are reprimands and revocation of a fishing license. Alleged violations can also be prosecuted by the police and in some cases it is the only available remedy to respond to violations. Then the Directorate of Fisheries can in individual cases, deprive individuals of a fishing license to enforce law enforcement and rules.

Based on the latest available Fiskistofa report, published in 2020, 164 cases were suspected of violations. The table below contains information on the number of cases by category.

Table 9. Fiskistofa suspected violations in 2020. Source: Fiskistofa 2020 Annual Report⁵⁸.

Suspected violation	No.
Veiðar án leyfis / Fishing without a permit	14
Brottkast / offences	11
Vigtun afla / weighing of catch	24
þar af vigtun vigtarleyfishafa of which the weighing by the weighing licensee	9
Framhjálföldun / landing	6
Afladagbók / logbook	40
Vanskil afladagbókar / submitting logbook late	470
Veiðar án aflaheimilda / Fishing with insufficient catch quotas	6
Mál vegna umframafla / Cases due to excess power	1321
Lax og silungsveiði / salmon and trout fishing	24
Undirmálsfiskur / bottom fish fishing	4
Röng tilgreining tegunda / Incorrect identification of species	3
Grásleppuveiðar / Greenland halibut fishing	13
Strandveiðar / coastal fishing	42
Annað s.s. tilkynningarskylda, löggilding vigtarmanns, vigtun án löggilts vigtarmanns, ónákvæmni við áætlun afla og hindrun eftirlits. / Other s.s. notification obligation, certification of the weigher, weighing without a certified weigher, inaccuracy in the catch plan and obstruction of control.	14

The table below also contains information regarding the penalties for suspected violations. The information does not show whether the decision of the Directorate of Fisheries has been repealed or amended by a ruling of the industry and the Consumer Innovation Council. The information in the tables cannot be compared with each other. One case could deal with several types of offenses. This can result in penalties and correction of catch registration. In addition, several violations by the same party may have been merged into one case.

The Directorate of Fisheries sent 470 letters due to catch logbooks not being returned on time and 1,321 cases arose due to fishing in excess of catch quotas, which then must be rectified by purchasing additional quota to balance the books or no further fishing is permitted.

Table 10. Fiskistofa penalties and follow up for suspected violations in 2020. Source: Fiskistofa 2020 Annual Report⁵⁹.

Penalties for suspected violations	No.
Mál kærð til lögreglu / Cases reported to the police	13
Áminningar / reminders	28
vegna brota gegn reglum um veiðar/ for violations of fishing rules	8

⁵⁸ http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

⁵⁹ http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

vegna brota gegn reglum um vigtun og skráningu afla / for violations of the rules on weighing and registration of catches	4
vegna brota gegn reglum um afladagbók / for violations of the rules on catch logbooks	5
framhjálföldun / for landing	4
brottkast / discards	4
ófullnægjandi flokkun undirmáls (aflaskráning einnig leiðrétt) / inadequate sub-classification of catches (catch registration also corrected)	3
Svipting veiðileyfis/ Revocation of fishing license	11
vegna brota gegn reglum um veiðar / for violations of fishing rules	4
vegna brota gegn reglum um afladagbók /for violations of the rules on catch logbooks	5
vegna brottkasts / due to discard	2
Ófullnægjandi flokkun undirmáls (aflaskráning einnig leiðrétt) /Insufficient sub-category classification (catch registration also corrected)	1
Hindrun eftirlits / Obstruction of control	1
Afturköllun vigtarleyfis / Revocation of weighing license	1
Afturköllun framkvæmdaleyfis í eða við veiðivatn / Revocation of a construction permit in or near a fishing lake	1
Mál sent öðru stjórnvaldi / Case sent to another authority	4
Ekki tilefni til beitingar viðurlaga eða leiðbeina / No need for sanctions or guidance	40
Leiðrétting aflaskráningar (auk leiðréttingar ófullnægjandi flokkunar undirmáls) / Correction of catch registration (in addition to correction of inadequate sub-classification of subheadings)	12
Leiðbeiningarbréf / Letter of instruction	119
Innheimtumál / Collection issues	
Ítrekunarbréf vegna ógreiddra veiðigjalda á árinu 2020: / Recurring letter regarding unpaid fishing fees in the year 2020:	181
Veiðileyfissviptingar: / Fishing license revocations:	26
Álagning gjalds vegna ólögðs sjávaraflla: / Imposition of a fee for illegal fishing	1323

7.4.2 Enforcement by the Icelandic Coast Guard

At sea surveillance is primarily the remit of the Icelandic Coast Guard (ICG). The Icelandic Coast Guard monitors commercial fishing vessels in Iceland's EEZ on a continuous basis. There are requirements surrounding the reporting of vessel position (manually or using VMS systems) and the reporting of catch on entering or leaving Icelandic waters, among others.

During the remote audit in November 2021 the ICG reported that surveillance in 2020 and 2021 was challenging due to the COVID 19 pandemic. By beginning of March 2020, severe restrictions on direct interactions between

people were imposed. This restricted surveillance possibilities on board vessels for Maritime Surveillance and Control agency such as the Icelandic Coast Guard (ICG).

To meet the situation the ICG patrol vessels increased their visibility, using their boats to monitor the fisheries close to the fishing vessels. There was also increased support and cooperation with Directorate of Fisheries by operating DF drones for surveillance from ICG patrol vessels.

In spite of the Coast Guard efforts the pandemic has had its impact. Fewer inspections and boardings of vessels resulted in less measuring of fish, which was reflected in fewer Short Time Closures in 2020 and 2021 (see Table 7) and none based on Fisheries inspections by ICG. The overall number of inspections since 1988 is shown below.

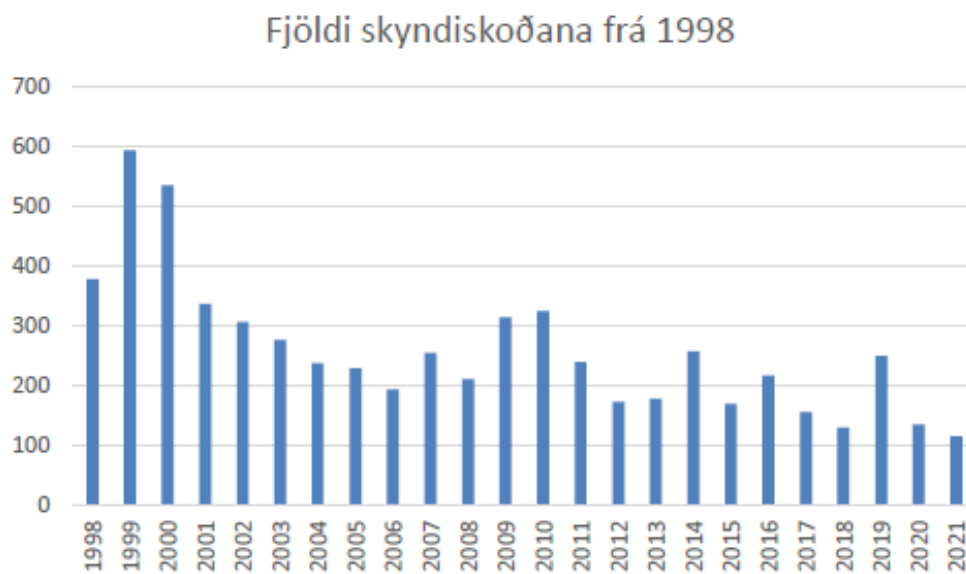


Figure 12. Overall number of ICG inspection from 1988 to 2021. Source: provided by the ICG during the remote audit, November 2021.

Also, we show here below a figure for the amount of air surveillance performed in 2021.

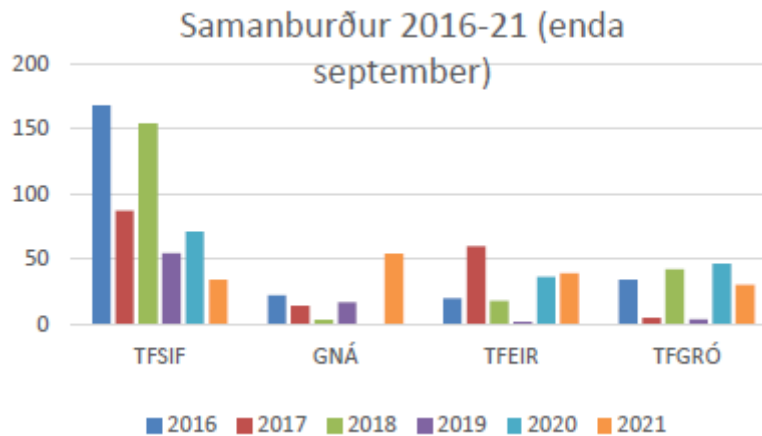


Figure 13. Air surveillance by four different Icelandic assets from 2016 to 2021. Samtals is the total. Source: provided by the ICG during the remote audit, November 2021.

Seven foreign flag vessels were also inspected the ICG in 2021, three Faroese vessels of which one was a longliner and two capelin fishing vessels, and four Norwegian capelin fishing vessels, all within Icelandic EEZ.

In terms of overall infringements, 8 reports of apparent infringements were reported in 2021, noting however that not all reports are due to fishing infringements and one report can include more than one type of Apparent Infringement. The types of apparent infringement in 2021, included: Lögskráningar/Crew registry, Veiðar /Fisheries, Veiðileyfi /Fishing permit, Ferilvöktun /Vessel monitoring, Farþegafjöldi /Passengers, Haffæri /Sea worthiness and a new addition Fyrirmælum ekki fylgt /Instructions not obeyed. These are shown below (until the end of September 2021) compared to historical data up to 2016.

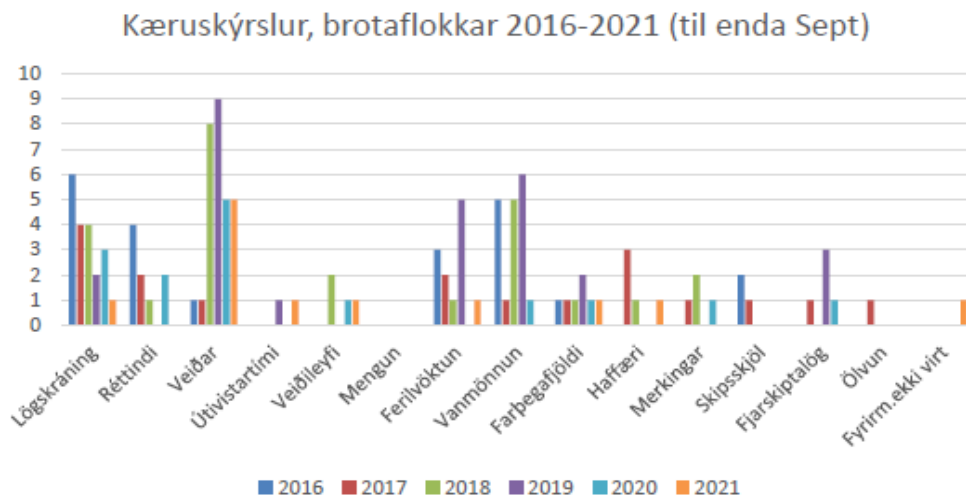


Figure 14. Overview of ICG infringement reports in 2016-2021. Source: provided by the ICG during the remote audit, November 2021.

From these eight reports, 12 apparent infringements were reported in 2021. For 2021, infringements on Veiðar /Fisheries are the 5 most common, and adding Veiðileyfi /Fishing permit brings the total number of infringements specifically regarding fisheries to 6. No apparent infringement were reported in 2021 in the following categories;

Réttindi /License, Mengun /Pollution, Vanmönun /Manning , Merkingar /Markings, Skipsskjöl /Ships documents, Fjarskiptalög /Communications or Ölvun /intoxication. Of the 8 vessels that were reported for apparent infringements in 2021, up to end of September, 6 vessels are less than 24 meters in length; 2 are more than 24 meters in length, one of which is a passenger vessel.

7.5 Bycatch, habitat and ecosystem update

Associated species catch and bycatch to the fishery

The fishery has been dominated by pelagic trawls in recent years, but both purse seine and pelagic trawls are considered ‘clean’ fisheries with relatively little bycatch. The bycatch species /associated catch to the ISS herring fishery are blue whiting, capelin, mackerel and Norwegian spring spawning herring. The status of these species has been updated and is shown below.

Table 11. Status of bycatch and associated species in the ISS herring target and non-target fisheries.

Status of bycatch and associated species in the ISS herring target and non-target fisheries as identified during the full assessment from historic average catches for each relevant gear type. All data and information is derived from the MFRI Advice page⁶⁰ for each individual species.

KOLMUNNI – BLUE WHITING (*Micromesistius poutassou*)⁶¹

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

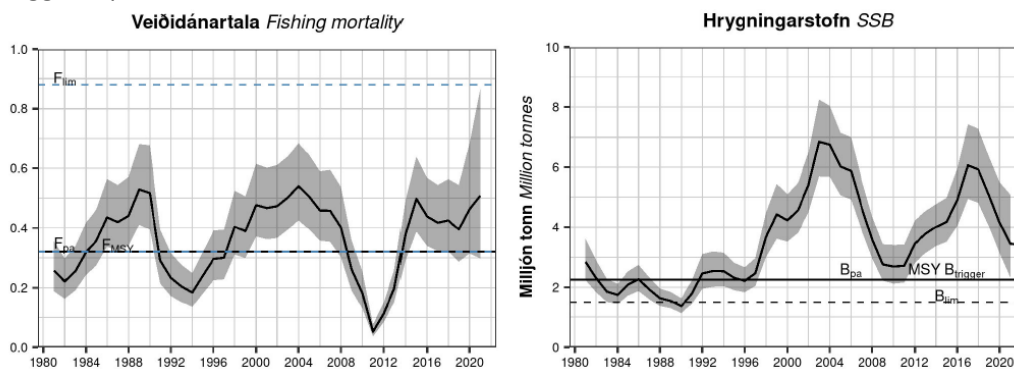


Figure 15. Blue whiting harvest rate and biomass.

LOÐNA – CAPELIN (*Mallotus villosus*)⁶²

According to the 2021 acoustic autumn survey, the SSB is estimated 1 833 000 tonnes. The harvest control rule (HCR) aims at leaving at least 150 000 tonnes (B_{lim}) of mature capelin at the time of spawning in March with 95% probability. Model projections show that with maximum catch of 904 200 tonnes during the fishing season 2021/2022, the HCR goal will be achieved. The index of immature capelin (age 1 and 2) was the third highest in the time series.

⁶⁰ <https://www.hafogvatn.is/en/harvesting-advice>

⁶¹ https://www.hafogvatn.is/static/extras/images/kolmunni_20211278352.pdf

⁶² <https://www.hafogvatn.is/static/extras/images/lofnahaust20211278547.pdf>

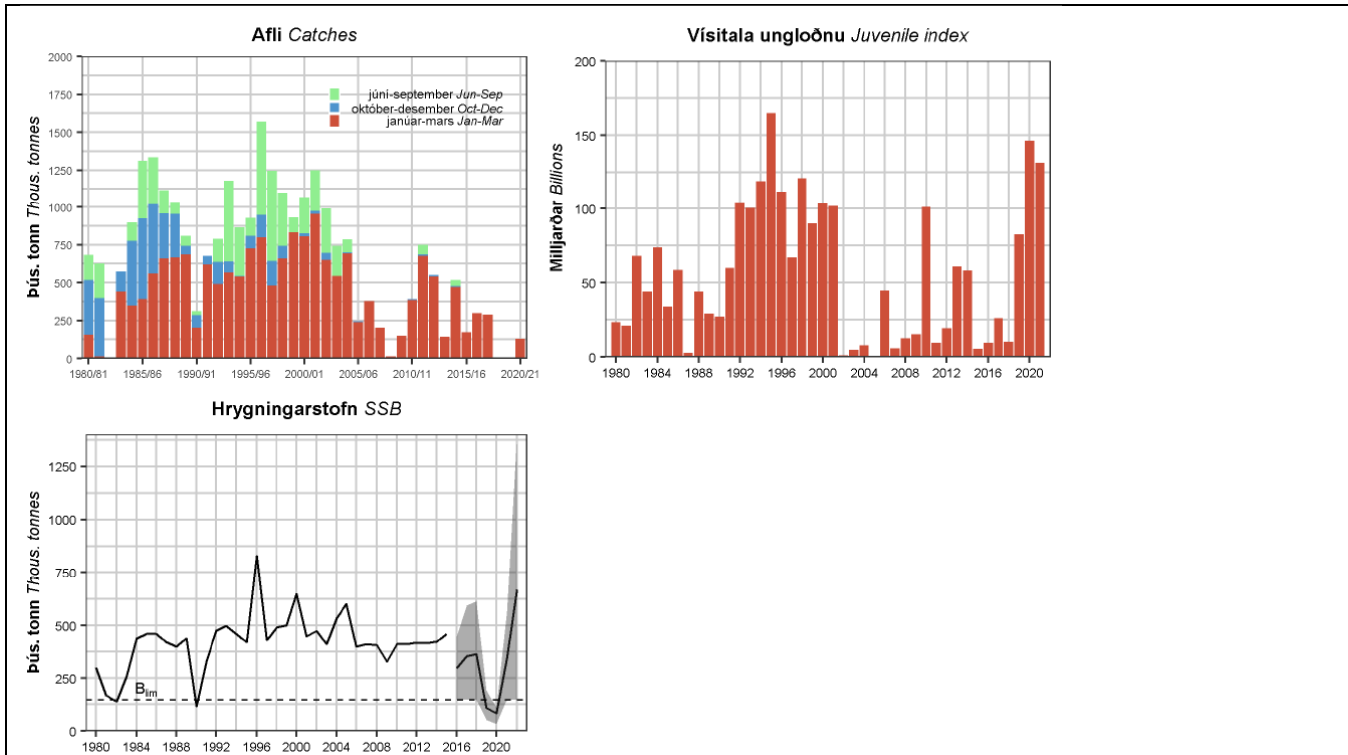


Figure 16. Capelin. Catches, acoustic index for immatures from autumn surveys, and SSB at spawning time after harvesting (with 90% confidence limits since 2016). The SSB value for 2016 and onwards is not directly comparable to historical values because it is based on different assumptions about natural mortality.

MAKRÍLL – MACKEREL (*Scomber scombrus*)⁶³

The spawning-stock biomass (SSB) is estimated to have increased since 2007, reaching a maximum in 2014, and has been declining since then. It has, however, remained above MSY Btrigger since 2008. Fishing pressure on the stock is below FMSY and spawning-stock size is above MSY Btrigger, Bpa, and Blim.

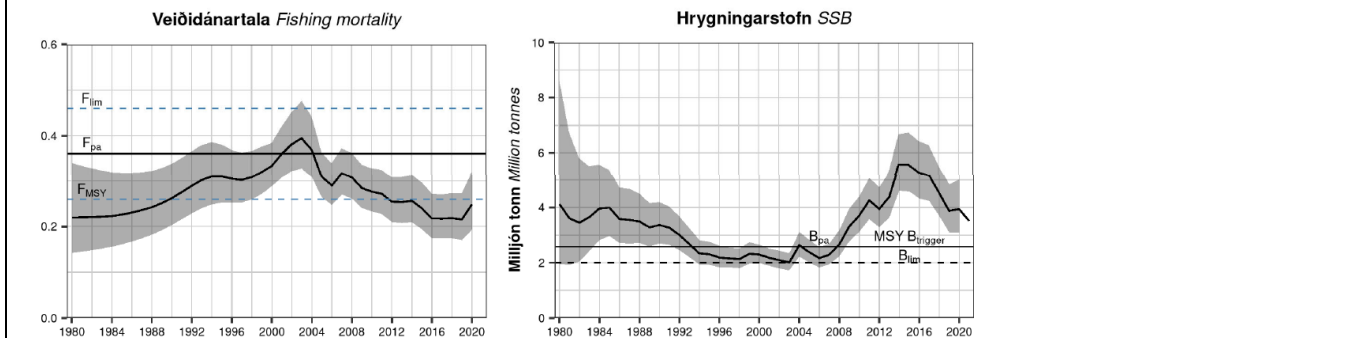


Figure 17. Mackerel harvest rate and biomass.

NORSK-ÍSLENSK VORGOTSSÍLD NORWEGIAN SPRING-SPAWNING HERRING (*Clupea harengus*)⁶⁴

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.

⁶³ https://www.hafogvatn.is/static/extras/images/makrill_20211278360.pdf

⁶⁴ https://www.hafogvatn.is/static/extras/images/sild-ni_20211278350.pdf

Fishing pressure on the stock is above FMSY but beneath Flim. Spawning-stock size is above MGT Btrigger, Bpa, and Blim.

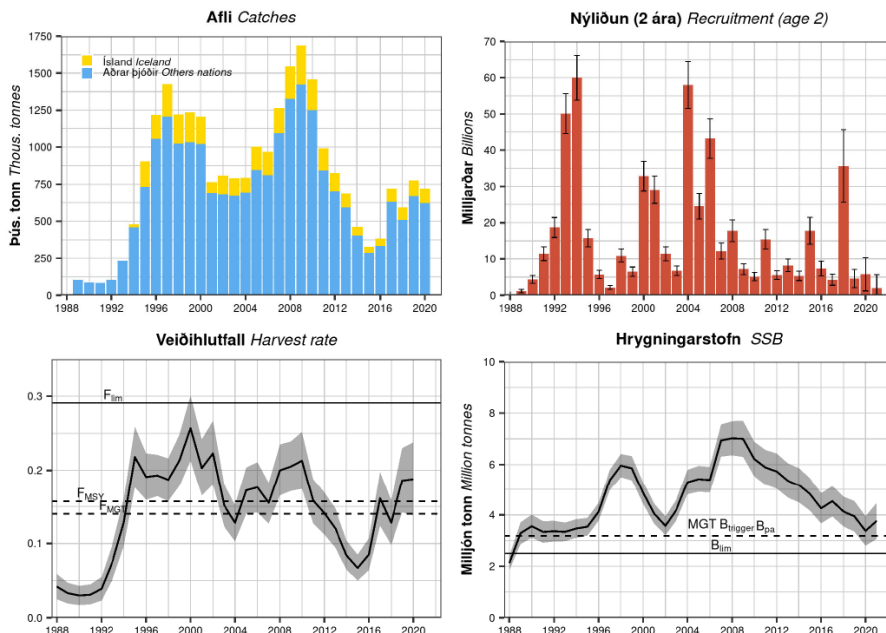


Figure 18. Catches, recruitment at age 2, fishing mortality and spawning stock biomass (SSB). Assessment run starts in 1988, when the stock has started to rebuild after collapse in the 1960s.

Endangered, Threatened and Protected (ETP) and vulnerable species interactions

The discard prohibition only applies to commercially important species and protected species including Atlantic halibut (*Hippoglossus hippoglossus*)⁶⁵ and porbeagle (*Lamna nasus*), basking shark (*Cetorhinus maximus*) and spurdog (*Squalus acanthias*)⁶⁶ unless they are captured alive in which case they must be released and systematic recording of non-commercial by-catch has not occurred. Measures have been taken in recent years to extend the inspector programme to cover by-catch such as elasmobranchs (pers. comm. MFRI, site visit) and records for by-catch species including skate (*Dipturus batis*), Atlantic halibut, dogfish, Greenland shark (*Somniosus microcephalus*) and porbeagle (*Lamna nasus*) can be seen in the catch data available via the Directorate website (<http://www.fiskistofa.is/english/quotas-and-catches/catches-in-individual-species/>). These are seen to be either vulnerable or endangered, threatened or protected (ETP) species. However, these species are unlikely to interact significantly with the gears used in the ISS herring fishery and in the last 5 year, there were no landings of these species reported in pelagic gears (2017 to 2021) based on Fiskistofa records.

⁶⁵ Regulation 470/2012. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302>

⁶⁶ Regulation 456/2017. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017>

ISS herring is important for killer whale (*Orcinus orca*) which in Iceland mainly prey upon herring and mackerel. There are on-going studies documenting this association (Sammara *et al.*, 2017 cited in⁶⁷). Fishermen report that killer whale are generally not seen during trawling for ISS herring. They are frequently observed during the purse seine fishery but fishermen report that interactions with the gear are rare. Adult killer whales are generally able to make their own way out of the net but can cause significant damage if they are caught and need to be cut free. If it looks likely that a killer whale will be caught the gear is released to prevent damage to it (pers. com. site visit). In relation to understanding of their population and its status, the last review of killer whales in the North Atlantic dates from 1987. The NAMMCO Scientific Committee recommended in their last meeting that a review be undertaken of all available information and current research activities on abundance, stock structure, and movements of killer whales in the North Atlantic in readiness for their next meeting. Initial abundance estimates for Icelandic waters range from 4,000-6,847 killer whales but these estimates may include killer whales from several populations over large areas. A recent study identified a minimum of 314 individuals regularly using the waters off the southern and west coasts of Iceland (Tavares *et al.*, 2016 cited in⁶⁸) and the MFRI, through their long-term killer whale project, have published a catalogue containing over 400 killer whale individuals identified between 2006 and 2015 on their website in 2017. Killer whale research continues in Iceland and is documented in the NAMMCO 2019 Iceland progress report.⁶⁹ New abundance estimates for killer whales in Icelandic and adjacent areas were published in 2020 (MFRI). The species is listed as 'Least Concern' on the Icelandic (2018) and Norwegian (2015) national red lists and as 'Data Deficient' on the IUCN Red List for both the European and global stock in the most recent assessments (2007 and 2017, respectively)⁷⁰.

Although evidence of the degree to which ISSH fisheries and marine mammals interact is sparse, available evidence would indicate that, in Icelandic waters, direct mortality of marine mammals as a result of interactions with pelagic fishing gears used in the fishery is likely to be low and unlikely to have detrimental effects at the population level.

Notwithstanding the above we provide here below some updates on vulnerable and ETP species bycatch that have a bearing on information availability from the Icelandic fleets and risk from the most important gear types (gillnet and longline).

Harbour Porpoises (*Phocoena phocoena*)

Harbour porpoises are classified as Least Concern in the IUCN Red List⁷¹ (population trend unknown, last assessed in 2020). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)⁷². Annual estimates of harbour porpoise by-catch have decreased in recent years as gillnet effort has decreased, from a high of 7,300 animals in 2003 to about 1600 animals in 2009–2013⁷³ and down to about 750 animals in 2014-2015.

⁶⁷ NAMMCO (2017). North Atlantic Marine Mammal Commission. Report of the 24th Scientific Committee meeting, 14-17 November 2017. <https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf>

⁶⁸ NAMMCO <https://nammco.no/topics/killer-whale/#1475844082849-433d5060-e5a9>

⁶⁹ <https://nammco.no/wp-content/uploads/2020/03/npr-is-national-progress-report-2019-iceland-nammco28-20205.pdf>

⁷⁰ <https://nammco.no/topics/killer-whale/>

⁷¹ <https://www.iucnredlist.org/species/17027/50369903>

⁷² <https://www.ni.is/node/27406>

⁷³ Pálsson ÓK, Gunnlaugsson Th, and Ólafsdóttir D. 2015. By-catch of seabirds and marine mammals in Icelandic Fisheries. Marine Research no 178. <https://www.hafogvatn.is/static/research/files/fjolrit-178pdf>

The latest Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise (19-22 March 2019)⁷⁴ reported the following about the Icelandic harbour porpoise population.

After reviewing the assessment and noting the recent decline in by-catch, the WG agreed that there was no specific cause for concern for harbour porpoises in Iceland. However, they also concluded that the lack of time and expertise meant they were not in a position to provide management advice on sustainable removals.

An aerial survey in Iceland is planned for harbour porpoise in 2023.

Harbour seals

The MFRI 2021 advice for harbour seals⁷⁵ indicates that the 2020 harbour seal census resulted in a population estimated of 10,319 animals (95% confidence intervals: 6,733-13,906). The current population estimate is 69% lower than the first abundance estimate from 1980 and the estimate is 14% under the management objective of 12 thous. Animals (Hafransóknastofnun 2021). In 2019, new regulation regarding seal hunting in Iceland was enacted (Atvinnuvega- og nýsköpunarráðuneytið 2019). All seal hunting is banned, but it is possible to obtain an exemption for traditional hunt. It is also forbidden to sell Icelandic seal products. Bycatch in gillnets is probably the highest mortality risk for harbour seals in Iceland currently. Limited data are available on seal bycatch, but data collected by on-board observers of the Directorate of Fisheries, and in the MFRI gillnet survey, indicate that on average, 1389 (coefficient of variation, CV=35) harbour seals have been bycaught annually in the lumpfish fishery between 2014 and 2018. Bycatch in cod gillnet fishery and bottom trawls is less common and more uncertainty associated with the bycatch estimates in those fisheries. Between 2014 and 2018, it has been estimated that annually, 15 harbour seals were bycaught in cod gillnet fisheries (CV=102) and 17 harbour seals in bottom trawls (CV=100) (Hafransóknastofnun, 2019). Negative effects from the cod gillnet fisheries (and associated fisheries that land fish in those nets) are considered to be very limited.

Other marine mammals

The MFRI confirmed that no interaction with Blue whales and Northern right whales recorded in recent years.

There are no further updates from NAMMCO or the MFRI in relation to other marine mammal species (i.e. seals), aside from what we reported in the previous surveillance report.

Pingers testing

The MFRI has been conducting pinger/acoustic device testing in gillnet fisheries for several years now, with mixed results. The last device tested in 2019-2020 showed promise, and publication on the results and possible larger scale trials were planned for 2021 (MFRI, personal communication, November 4th 2021).

Gulper sharks

Some catch of leaf scale gulper sharks has been recorded, last in 2016. Survey trends are presented below.

⁷⁴ https://nammco.no/wp-content/uploads/2019/02/final-report_hpwg-2019.pdf

⁷⁵ <https://www.hafogvatn.is/static/extras/images/radgjof-landselur20201286028.pdf>

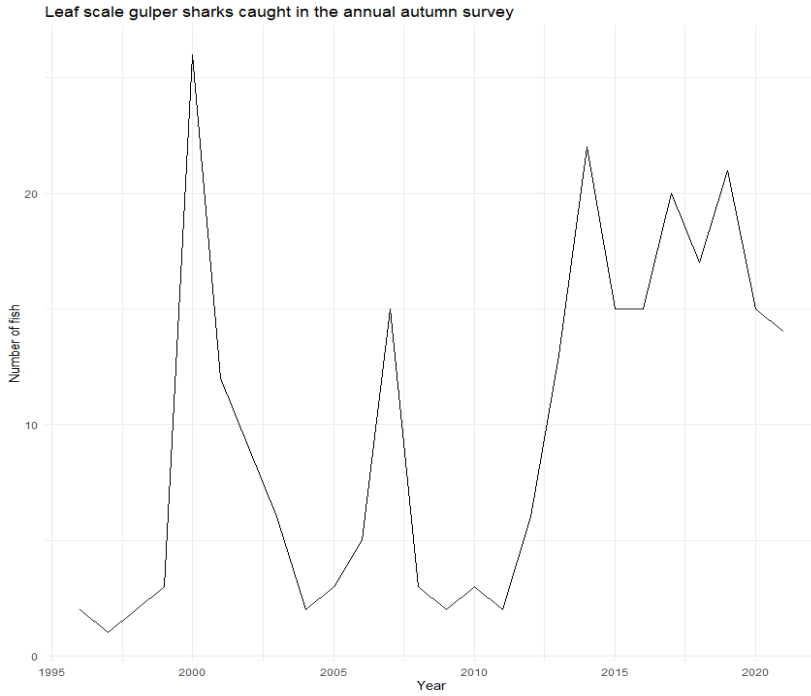


Figure 19. Leaf scale gulper shark caught in the annual autumn survey, from 1995 to 2021.

Grey skate (*Dipturus flossada / batis*) landed catch in 2019 was 194 t, and 160 t in 2020. Survey abundance is variable but has been on average relatively stable in recent years.

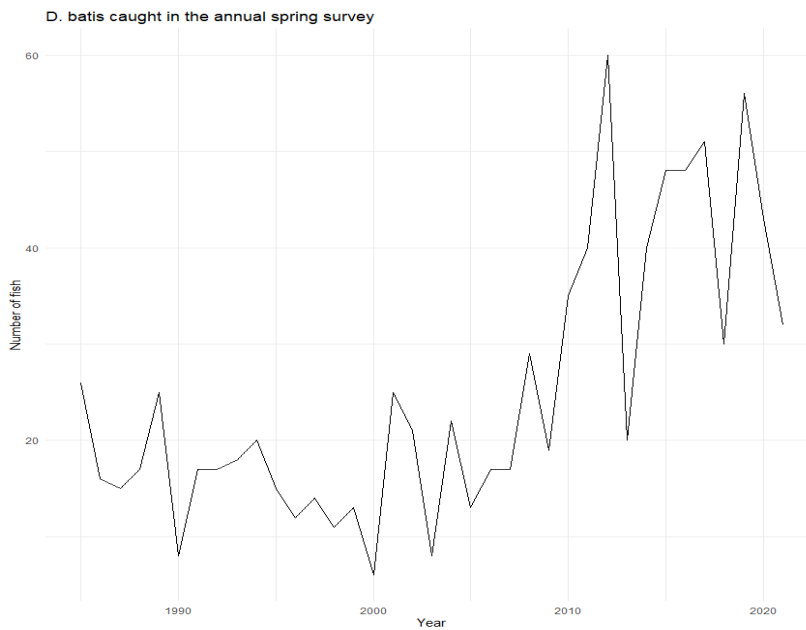


Figure 20. D. batis caught in the annual spring survey, from 1985 to 2021.

Landed catch of dogfish (*Squalus acanthias*) was 1 t in 2019 and 3 t in 2020. Survey trends are very sporadic.

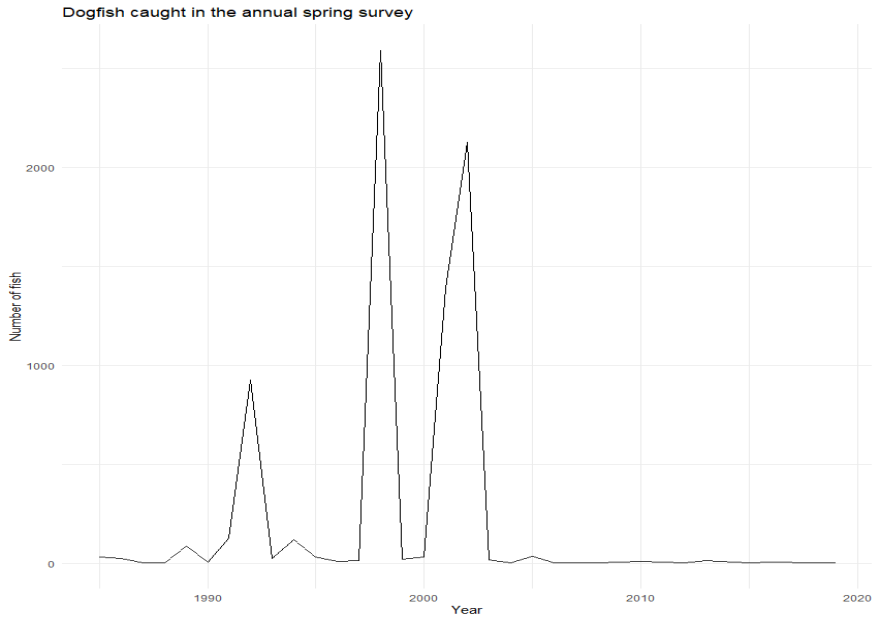


Figure 21. Dogfish caught in the annual spring survey, 1985 to 2021.

Landed catch of Greenland shark (*Somniosus microcephalus*) was 6 t in 2019 and 2 t in 2020. Survey trends are also very sporadic.

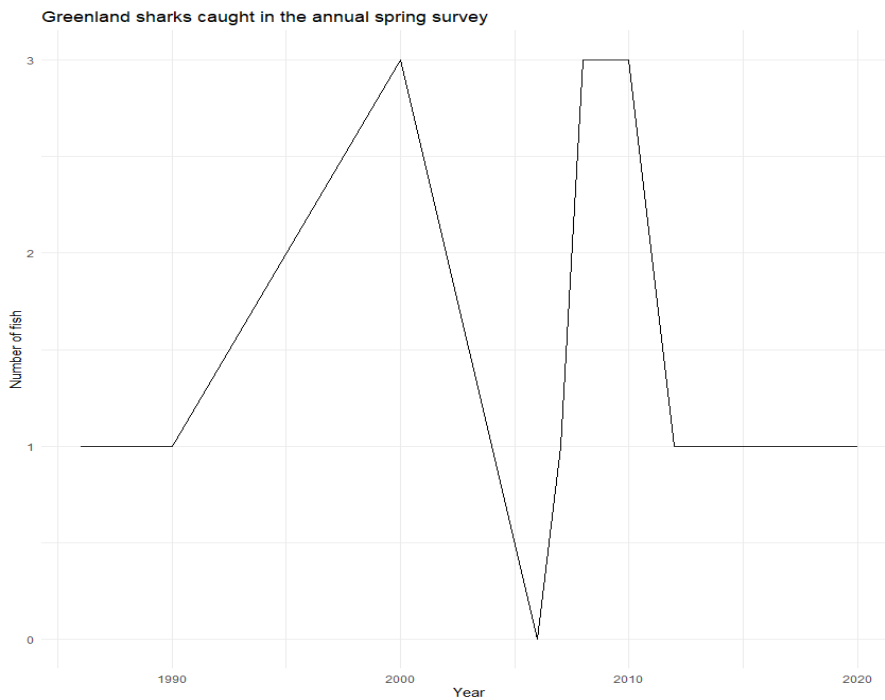


Figure 22. Greenland shark caught in the annual spring survey.

Landed catch of porbeagle in 2019 was 2.6 t and 3.6 t in 2020.

Porbeagles (*Lamna nasus*) are rarely caught in surveys, but two were caught in the autumn survey in 2021 and one in the gillnet survey in 2019.

Trawl effort spatial extent

The ICES 2020 Icelandic ecosystem overview report⁷⁶ indicates that within the ecoregion, abrasion caused by bottom trawls has been shown to impact fragile three-dimensional biogenic habitats in particular (e.g. sponge aggregations, coral gardens, and coral reefs), with impacts happening mainly in deeper waters (> 200 m). Effects of bottom trawling on soft substrates in shallow waters have been shown to be minor. Other impacts involve overturning boulders, scouring the seabed, and direct removal of and/or damage to epifaunal organisms.

Using vessel monitoring system (VMS) and logbook data ICES estimates that mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category have been deployed over approximately 132,485 km² of the ecoregion in 2018, corresponding to ca. 17.5 % of the ecoregion's spatial extent. A map of spatial distribution of bottom trawl effort is shown below. The Icelandic bottom trawl fleet consists of about 50 vessels (30–80 m length) fishing mainly for cod, haddock, saithe, redfish, and Greenland halibut.

The herring fishery, however, is not considered to affect bottom sea habitats in any significant way.

Foodweb considerations

In Icelandic waters herring are both a major predator of zooplankton and an important prey species with numerous species of fish, marine mammals and seabirds all being major predators of herring. Herring therefore, are an important part of the ecosystem with many trophic connections. However, the Icelandic marine ecosystem is not considered to be wasp-waisted due to the presence of several other abundant, high biomass, low trophic level stocks including capelin, mackerel and blue whiting. These other abundant high biomass stocks demonstrate similar levels of trophic connectivity and provide alternative pathways through which energy can be transferred to higher trophic levels. This was shown in a study by Stulodottir et al. in 2018⁷⁷ in an 'end-to-end' dynamic ecosystem model of Icelandic waters using the Atlantis framework. In addition, predators of herring are primarily highly mobile, opportunistic feeders that are not reliant exclusively on herring as a food source. The ISS herring stock biomass has been significantly above precautionary limits in recent years reaching its highest estimated levels in the late 2000s before falling recently due to high natural mortality caused by an *Ichthyophonus* infection and poor recruitment. Given the current management regime and based on the harvest strategy assumptions, there is little risk of Icelandic fisheries reducing herring stocks to the point where populations of dependent predators would be adversely affected. The stock is currently above MSY Btrigger as of 2021⁷⁸, and spawning stock biomass is expected to increase in the coming years due to better recruitment and large incoming year classes. Available evidence would suggest that indirect impacts of ISS herring fisheries are unlikely to have severe adverse impacts on dependent predators and the integrity of the stock's role in the marine ecosystem is most likely protected.

⁷⁶ https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/EcosystemOverview_IcelandicWaters_2020.pdf

⁷⁷ <https://www.sciencedirect.com/science/article/pii/S0165783618301620>

⁷⁸ <https://www.hafogvatn.is/static/extras/images/22-herring1259461.pdf>

7.6 Update on consistency to the fundamental clauses of the RFM Fishery Standard

This section includes a brief update on changes in the fishery relevant to the fundamental clauses of the IRF Fishery Standard and a statement of continuing consistency (or not) to those fundamental clauses.

Section 1. Fisheries Management

7.6.1 Clause 1.1 Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls

1.1	Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls including: <ul style="list-style-type: none"> – The fisheries management system – The fisheries management plan
Summary of relevant changes:	<p>Overview</p> <p>The fisheries management consists of a network of organisations and agencies with a legal basis in terms of a suite of laws and regulations. The Ministry of Industries and Innovation has the ultimate responsibility, the Directorate of Fisheries is the executive body, the Coast Guard does control and surveillance and the MFRI is the scientific institution that provides advice to the Ministry. Internationally, ICES organises and approves assessment and management plan evaluation. The legal basis for the management is a suite of laws and regulations. Laws are given by the Parliament (Althingi), regulations are given by the Ministry.</p> <p>The main regulations are quota regulations of the catches in an ITQ system, technical regulations (gear standards, mesh sizes etc), area closures (permanent and temporary, including short term closures), landing obligations in authorized ports where the catches have to be weighed by authorized staff⁷⁹ and a discard ban⁸⁰. There are rules for minimum landing size – smaller fish has to be landed but the fisher gets only a fraction of the payment. There are a range of special regulations for small coastal boats and regulation of tourist fishery (which also has quotas). Log books are compulsory, and recently, only electronic logbooks (or mobile phone apps) are accepted. The fishery for herring has a specific regulation.⁸¹ The fishing year in Iceland runs from 1st September - 31st August.</p> <p>All catches have to be accounted against quotas, and there is an active marked or selling and buying quotas as needed. There is some opportunity to transfer herring quotas between years.</p> <p>The management plan includes the measures noted above. It has a harvest rule for deriving the total quota from a stock assessment. The plan includes reference points for biomass and exploitation rate. Such plans are generally developed by Iceland, mostly by the MFRI, and evaluated and endorsed by ICES.</p>
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.

79 <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/20213>

80 <https://www.althingi.is/lagas/nuna/1996057.html>

81 Regulation 962/2019: <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662>

1.1 Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls including:	
– The fisheries management system	
– The fisheries management plan	
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

7.6.2 Clause 1.2 Research and Assessment

1.2 Research and Assessment	
Summary of relevant changes:	<p>Icelandic summer spawning herring is a local stock, that is distributed mostly in the Western and Southern part of the coast at locations that have varied over the years, but have been fairly stable for the last 7-8 years. It is assessed using an ADAPT type method from the NOAA assessment toolbox, tuned to an acoustic survey. The method was approved for assessing the herring by ICES in a benchmark process in 2011⁸² and has been used consistently since then. It was revisited and endorsed in 2017⁸³. Other methods have been applied in parallel for control, recently it was a separable model. The models give very similar results. A new benchmark is planned in 2023.</p> <p>The acoustic survey is split in two parts and is adapted to the current distribution. Catch numbers at age are obtained by splitting the total catch to catch in numbers at age using samples collected at sea by fishermen. Catches in the summer are mixed with Norwegian spring spawning herring, that is separated out by inspection of the gonads, that are quite different at that time. Infection by <i>Ichthyophonus hoferi</i> gives additional mortality, that is estimated from the prevalence of the disease in samples.</p> <p>The assessment has been problematic in periods in the past, but has been stable with satisfactory diagnostics in the last 7-8 years. After a long period with declining recruitment and stock biomass, both the 2017 and probably 2018 year classes are large. That leads to a recent rise in the SSB and allows increased quota recommendations. The harvest rate has fluctuated around the target value for the last 10 years. At present, it is slightly below the target.</p> <p>The main results are summarized in the figure below.</p>

82 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2011/WKBENCH%202011/WKBENCH_2011.pdf

83 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/Iceland.2017.09.pdf

1.2 Research and Assessment

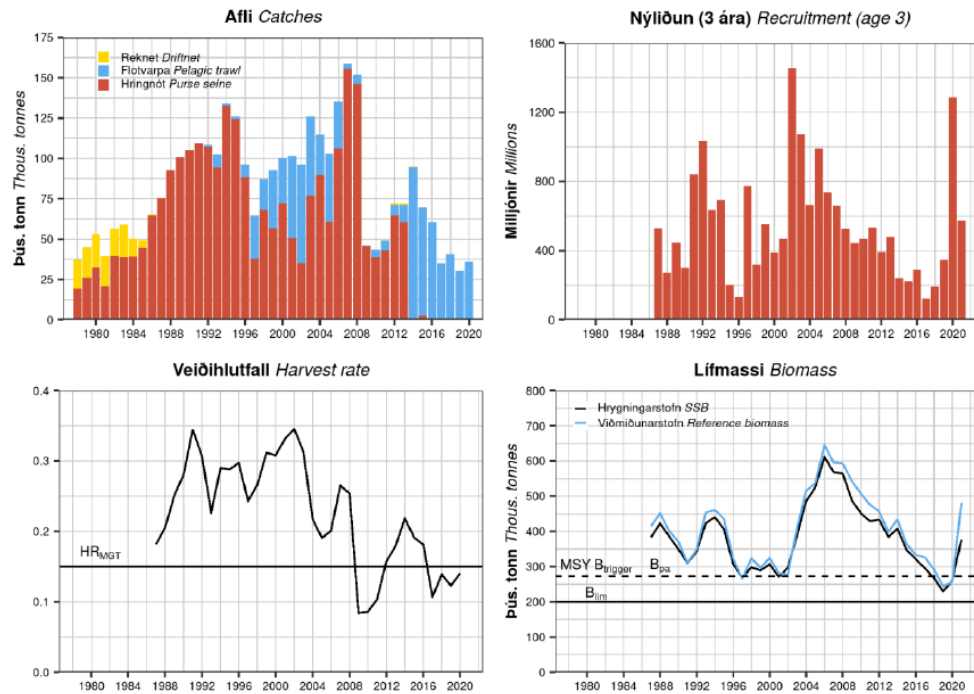


Figure 23. Catch by gear type, recruitment, harvest rate based on reference stock biomass, reference stock biomass (B4+) and spawning stock biomass (SSB). Source: 2021 MFRI stock assessment.⁸⁴

References: Please refer to the footnotes and references in the text above, the [summary/background section](#) and the [Reference section](#) at the end of this document.

Statement of continuing consistency to the IRF Fishery Standard

The fishery continues to remain consistent with the standard.

7.6.3 Clause 1.3 Stock under Consideration, Harvesting Policy and the Precautionary Approach

1.3 Stock under Consideration, Harvesting Policy and the Precautionary Approach including:

- 1.3.1 The precautionary approach
- 1.3.2 Management targets and limits
 - 1.3.2.1 Harvesting rate and fishing mortality
 - 1.3.2.2 Stock biomass
 - 1.3.2.3 Stock biology and life-cycle (structure and resilience)

Summary of relevant changes: The precautionary approach is implemented by following a harvest rule based on precautionary reference points.

Reference points were defined by ICES and adopted by Iceland in 2016-17. They are tabulated below.

⁸⁴ <https://www.hafogvatn.is/static/extras/images/22-herring1259461.pdf>

- 1.3 Stock under Consideration, Harvesting Policy and the Precautionary Approach including:
 - 1.3.1 The precautionary approach
 - 1.3.2 Management targets and limits
 - 1.3.2.1 Harvesting rate and fishing mortality
 - 1.3.2.2 Stock biomass
 - 1.3.2.3 Stock biology and life-cycle (structure and resilience)

Table 12. Reference points for herring.

Nálgun Framework	Viðmiðunarmörk Reference point	Gildi Value	Grundvöllur Basis
Aflaregla Management plan	MGT B _{trigger}	200 000 t	Aðgerðarmörk í aflareglu sem standast MSY viðmið ICES Trigger point in HCR considered consistent with ICES MSY framework
	HR _{MGT}	0.15	Slembireikningar í aflaregluhermun. Hlutfall af viðmiðunarstofni Stochastic HCR evaluation. Proportion of age 4+ biomass
MSY	MSY B _{trigger}	273 000 t	B _{pa}
	F _{MSY}	0.22	Slembireikningar í aflaregluhermun. Stochastic HCR evaluation
Varúðarnálgun Precautionary approach	B _{lim}	200 000 t	Stærð hrygningarstofns þar sem líkur eru á skertri nýliðun SSB beyond which recruitment becomes impaired
	B _{pa}	273 000 t	B _{lim} * e ^{-1.645σ} , σ = 0.19
	F _{lim}	0.61	F sem leiðir til B _{lim} miðað við meðal nýliðun F corresponding to B _{lim} with average recruitment
	F _{pa}	0.45	F _{pa} = F _{lim} × exp(-1,645 × σ), σ = 0.18

The limit biomass has been at 200 000 tonnes for decades, and recent revisions have not revealed strong reasons to change it. B_{pa} is defined as the 95-percentile of B_{lim} when assuming an assessment error with CV = 0.19. An F_{lim} is derived as the F having a 50% probability of leading below B_{lim}, and F_{pa} is at the 5-percentile of F_{lim} assuming a CV of 0.18.

There is a harvest rule in place, which was revised, approved by ICES and adopted by Icelandic authorities in 2017 for the next 5 years. The exploitation rate is defined in terms of a harvest rate (HR = Catch/Biomass aged 4+), rather than fishing mortality, which is in line with most Icelandic stocks.

The official formulation is:

According to the Harvest Control Rule (HCR) the TAC for the fishing year y/y+1 (1 September of year Y to 31 August of year y+1) as 15% (HRMGT) of the biomass of herring age 4 and older (B_{Ref,y}) in the assessment year (y) calculated as:

$$TAC_{y/y+1} = HRMGT * B_{Ref,y}$$

If the spawning stock biomass (SSB) falls below 200 000 tonnes (MGT B_{trigger}), the HCR dictates that harvest rate shall be reduced linearly to zero based on the ratio of the SSB estimated and MGT B_{trigger}, the TAC for the fishing year y/y+1 is then calculated as:

$$TAC_{y/y+1} = HRMGT * (SSB_y / MGT B_{trigger}) * B_{Ref,y}$$

Since the harvest rule limits the exploitation by applying a constant harvest rate, a biomass target is redundant and not included in the harvest rule. However, a requirement for

1.3 Stock under Consideration, Harvesting Policy and the Precautionary Approach including:	
1.3.1	The precautionary approach
1.3.2	Management targets and limits
1.3.2.1	Harvesting rate and fishing mortality
1.3.2.2	Stock biomass
1.3.2.3	Stock biology and life-cycle (structure and resilience)
	accepting the rule was that it implied a low (<5%) risk of bringing the SSB below Blim in simulations taking relevant uncertainties into account.
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

7.6.4 Clause 1.4 External Scientific Review

1.4 External Scientific Review	
Summary of relevant changes:	ICES ⁸⁵ is regarded as the relevant scientific body for external scientific review. It organizes stock assessments, performs evaluations of management plans and advises on a wide range of issues within marine science, including fisheries management. The assessment and the management plan for herring were evaluated and approved in 2017. The approved procedures have been followed since then.
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

7.6.5 Clause 1.5 Advice and Decisions on TAC

1.5 Advice and Decisions on TAC	
Summary of relevant changes:	Stock assessment and advice, including advice on harvest rules, TACs and reference points is provided by ICES. The process involves all relevant nations and the advice is for all areas. The advice is published on the MFRI website once it is ready ⁸⁶ . Normally, the MFRI advice follows the ICES advice. The Minister of Fisheries and Agriculture decides on the TAC of the herring stock for each fishing year (Sept –Aug) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned above. The minister will generally follow the advice from ICES and MFRI, but has the authority to deviate from the advice if needed. The Icelandic summer spawning herring is a local stock in Iceland.
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

85 <http://www.ices.dk>

86 <https://www.hafogvatn.is/static/extras/images/22-herring1259461.pdf>

Section 2. Compliance and Monitoring

7.6.6 Clause 2.1 Implementation, Compliance, Monitoring, Surveillance and Control

2.1 Implementation, Compliance, Monitoring, Surveillance and Control	
<p>Summary of relevant changes:</p>	<p>The Icelandic Directorate of Fisheries, or Fiskistofa⁸⁷, is an independent administrative body responsible to the Fisheries Minister, in charge of the day to day implementation of the Act on Fisheries Management and related legislation, for day-to-day management of fisheries and for supervising the enforcement of fisheries management rules. More specifically, the Directorate of Fisheries works in accordance with the following Acts, the Directorate of Fisheries Act (no. 36/1992)⁸⁸, the Fisheries Management Act (no. 116/2006)⁸⁹, the Act on Fishing in Iceland’s Exclusive Economic Zone (no. 79/1997), the Act concerning the Treatment of Commercial Marine Fish Stocks (no. 57/1996) and the Act on a Special Fee for Illegal Marine Catch (no. 37/1992). Accordingly, it issues fishing permits to vessels and allocates catch quotas, imposes penalties for illegal catches, supervises the transfer of quotas and quota shares between fishing vessels, monitors vessels using the VMS system e-logbooks, controls the reporting of data on the landings of individual vessels and monitors the weighing of catches⁹⁰. It also provides supervision on board fishing vessels and in ports of landing (i.e. shore based monitoring), which involves inspecting the composition of catches, fishing equipment and handling methods. It works closely with the Icelandic Coast Guard, which carries out fisheries inspection at sea, monitors the EEZ and receives required notifications from vessels, Port Authorities and the MFRI.</p> <p>The Icelandic Coast Guard⁹¹ is responsible for control at sea, both of the catches and the quality of the vessels. It performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters, and monitoring of fishing within the zone in consultation with the Marine and Freshwater Research Institute and Ministry of Industries and Innovation. The Coast Guard operates the Icelandic Maritime Traffic Service within its operations centre which has a key role in ensuring safety at sea, but can also take action if the behaviour of a fishing vessels is unusual.</p> <p>The Fisheries Management Act sets out penalties for the violation of its provisions, or rules adopted by virtue of it, which are provided in detail in the Act Concerning the Treatment of Commercial Marine Fish Stocks (Act No. 57 1996⁹²). Provisions of the Act on a Special Fee for Illegal Marine Catch⁹³ are also applied as appropriate. Penalties range from the issue of reprimands by the Directorate of Fisheries and the suspension of commercial fishing permits to fines and, in cases of serious or repeated deliberate violation, imprisonment for up to six years (Article 24 and 25 of Act No. 116/2006).</p> <p>Summary of relevant updates in 2021</p>

⁸⁷ <https://www.fiskistofa.is/umfiskistofu/>

⁸⁸ <https://www.althingi.is/lagas/149a/1992036.html>

⁸⁹ <https://www.ecolex.org/details/legislation/fisheries-management-act-1990-lex-faoc003455/>

⁹⁰ <http://www.fiskistofa.is/english/about-the-directorate/>

⁹¹ <http://www.lhg.is/english>

⁹² <https://www.althingi.is/lagas/149a/1996057.html>

⁹³ <https://www.althingi.is/lagas/149a/1992037.html>

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

Temporary/sudden closures (generally 2 weeks triggered by high juvenile abundance on fishing grounds) are announced by the Coastguard on VHF radio on a specified wavelength and on the radio before the news and weather (Fisheries Directorate pers. com. site visit November 2021). They are also published on the MFRI website. The short-term closure monitoring (and issuing of) was transferred to Fiskistofa in the fall of 2020. Some regulation regarding the short-term closures was also changed in 2020, whereby the trigger size limit was increased for cod, which led to significant decrease in the number of closures. An updated table as provided by the management authorities (MFRI and Fiskistofa) is shown below.

Table 13. Short term closures in Iceland for the years 2018-2021.

Year	Species	Number of closures
2018	Cod	90
2018	Saithe	4
2018	Shrimp	2
2018	Haddock	1
2019	Cod	50
2019	Haddock	1
2020	Cod	9
2020	Haddock	1
2020	Greenland halibut	1
2021	Sea cucumber	2
2021	Cod	3
2021	Haddock	1

Directorate Inspections at Sea

Days spent by Fisheries Directorate inspectors at sea inspecting vessels is shown in **Error! Reference source not found.**. The number has remained consistent with previous years.

Enforcement by Fiskistofa

The Directorate of Fisheries monitors compliance with laws and regulations which apply to fishing, handling of commercial stocks and treatment catch. In many cases, the Directorate of Fisheries is intended to respond to violations of laws and regulations through the application of administrative sanctions. Sanctions are intended to have a protective effect to reduce or prevent further violations. The main resources available to the Directorate of Fisheries for violations are reprimands and revocation of a fishing license. Alleged violations can also be prosecuted by the police and in some cases it is the only available remedy to respond to violations. Then the Directorate of Fisheries can in individual cases, deprive individuals of a fishing license to enforce law enforcement and rules.

Based on the latest available 2020 Fiskistofa report, in 2020, 164 cases were suspected of violations. **Error! Reference source not found.** contains information on the number of cases by category.

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

Error! Reference source not found. also contains information regarding the penalties for suspected violations. The information does not show whether the decision of the Directorate of Fisheries has been repealed or amended by a ruling of the industry and the Consumer Innovation Council. The information in the tables cannot be compared with each other. One case could deal with several types of offenses. This can result in penalties and correction of catch registration. In addition, several violations by the same party may have been merged into one case.

The Directorate of Fisheries sent 470 letters due to catch logbooks not being returned on time and 1,321 cases arose due to fishing in excess of catch quotas, which then must be rectified by purchasing additional quota to balance the books or no further fishing is permitted.

Enforcement by the Icelandic Coast Guard

At sea surveillance is primarily the remit of the Icelandic Coast Guard (IO043G). The Icelandic Coast Guard monitors commercial fishing vessels in Iceland's EEZ on a continuous basis. There are requirements surrounding the reporting of vessel position (manually or using VMS systems) and the reporting of catch on entering or leaving Icelandic waters, among others.

During the remote audit in November 2021 the ICG reported that surveillance in 2020 and 2021 was challenging due to the COVID 19 pandemic. By beginning of March 2020, severe restrictions on direct interactions between people were imposed. This restricted surveillance possibilities on board vessels for Maritime Surveillance and Control agency such as the Icelandic Coast Guard (ICG).

To meet the situation the ICG patrol vessels increased their visibility, using their boats to monitor the fisheries close to the fishing vessels. There was also increased support and cooperation with Directorate of Fisheries by operating DF drones for surveillance from ICG patrol vessels.

In spite of the Coast Guard efforts the pandemic has had its impact. Fewer inspections and boardings of vessels resulted in less measuring of fish, which was reflected in fewer Short Time Closures in 2020 and 2021 (see Table 7) and none based on Fisheries inspections by ICG. The overall number of inspections since 1988 is shown below.

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

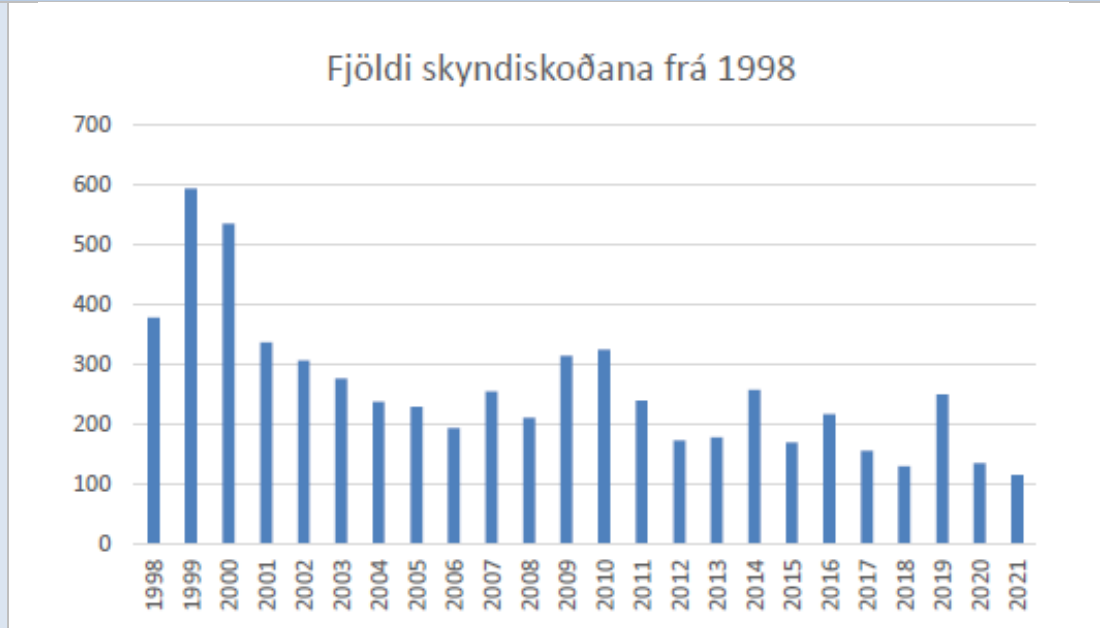


Figure 24. Overall number of ICG inspection from 1988 to 2021. Source: provided by the ICG during the remote audit, November 2021.

Also, we show here below a figure for the amount of air surveillance performed in 2021.

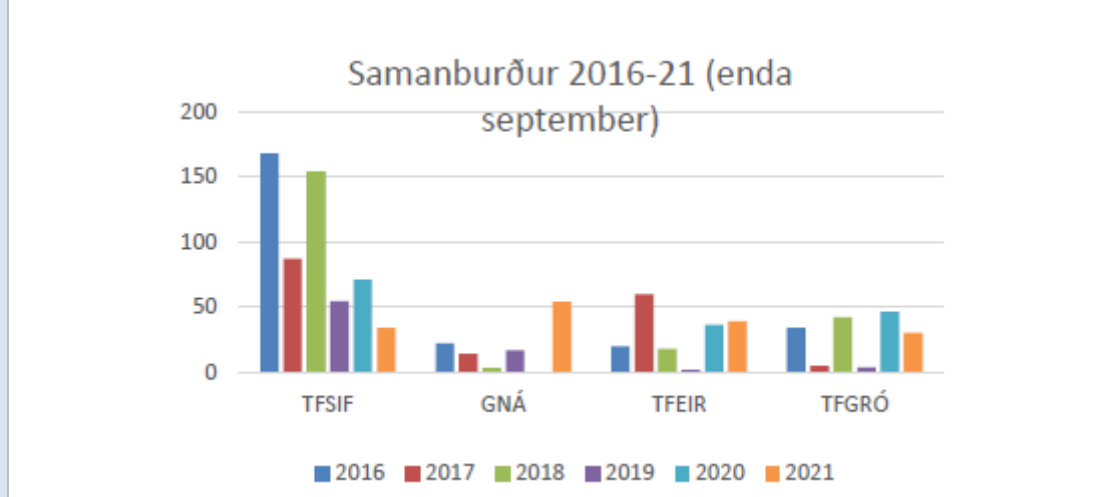


Figure 25. Air surveillance by four different Icelandic assets from 2016 to 2021. Samtals is the total. Source: provided by the ICG during the remote audit, November 2021.

Also, seven foreign flag vessels were inspected the ICG in 2021, three Faroese vessels of which one was a longliner and two capelin fishing vessels, and four Norwegian capelin fishing vessels, all within Icelandic EEZ.

In terms of overall infringements, 8 reports of apparent infringements were reported in 2021, noting however that not all reports are due to fishing infringements and one report can include more than one type of Apparent Infringement. The types of apparent

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

infringement in 2021, included: Lögskráningar/Crew registry, Veiðar /Fisheries, Veiðileyfi /Fishing permit, Ferilvöktun /Vessel monitoring, Farþegafjöldi /Passengers, Haffæri /Sea worthiness and a new addition Fyrimælum ekki fylgt /Instructions not obeyed. These are shown below (until the end of September 2021) compared to historical data up to 2016.

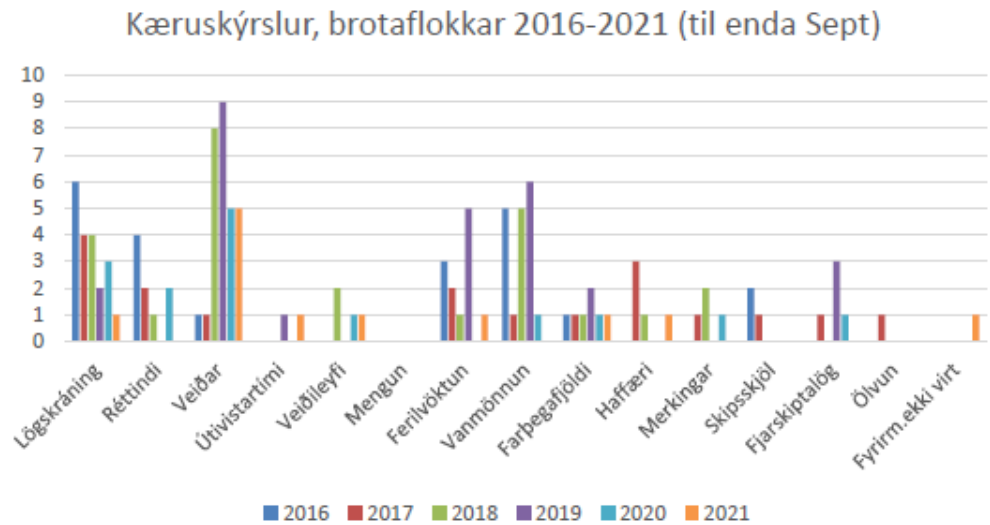


Figure 26. Overview of ICG infringement reports in 2016-2021. Source: provided by the ICG during the remote audit, November 2021.

From these eight reports, 12 apparent infringements were reported in 2021. For 2021, infringements on Veiðar /Fishing are the 5 most common, and adding Veiðileyfi /Fishing permit brings the total number of infringements specifically regarding fisheries to 6. No apparent infringement were reported in 2021 in the following categories; Réttindi /License, Mengun /Pollution, Vanmönnum /Manning , Merkingar /Markings, Skipsskjöl /Ships documents, Fjarskiptalög /Communications or Ölvun /intoxication. Of the 8 vessels that were reported for apparent infringements in 2021, up to end of September, 6 vessels are less than 24 meters in length; 2 are more than 24 meters in length, one of which is a passenger vessel.

References: Please refer to the footnotes and references in the text above, the [summary/background section](#) and the [Reference section](#) at the end of this document.

Statement of continuing consistency to the IRF Fishery Standard The fishery continues to remain consistent with the standard.

7.6.7 Clause 2.2 Concordance between actual Catch and allowable Catch

2.2 Concordance between actual Catch and allowable Catch

Summary of relevant changes: **Context** Catches and landings in Iceland are monitored and recorded in a number of complementary ways. Logbooks, either electronic (e-logs) or standard paper based, depending on the vessel, record landings at sea and these are verified and standardised through physical weighing at accredited weigh stations in landings ports throughout Iceland. Logbooks are

2.2 Concordance between actual Catch and allowable Catch

compulsory as required by Regulation No.746/2016⁹⁴. These must be electronic (e-logs). Small vessels used to use paper logbooks until late 2020 when regulation 298/2020⁹⁵ implemented the use of an electronic app. The App also called Afladagbókina or catch diary^{96 97} automatically records the location of the boat during fishing and the captains then records the catch, its condition and bycatch. Catch data must be entered on the e-log using a Fisheries Directorate-approved programme and all changes to entries must be visible and traceable. It is prohibited to start a fishing trip without a logbook on board. Vessel masters are required to record the following information in their logbooks:

- Ship name, ship registration number and call sign.
- Fishing gear, type and size.
- Location determination (latitude and longitude) and time when fishing gear is placed in the sea.
- Catch by quantity and species.
- Harvesting.
- Landing.
- Seabirds bycatch by species and species.
- Marine mammals' bycatch by number and species.

Landings must be weighed within 2 hours of landing by an official weigher using calibrated scales. Following allowances for ice the official weight is forwarded to the Directorate where it is compared with the relevant e-logbook entry before an appropriate deduction is made to that vessels remaining quota. The officially weighed catches are the official catch of record with e-log information being used as a secondary source to ensure accuracy. If a vessel does not have sufficient quota to cover it has a number of options available to it such as renting in additional quota or transferring quota between species; however, the landings must be fully covered within 3 working days as required by law (Act No. 57/1996). In Iceland, the time restrictions attached to landing, recording and rationalising catch and quota mean that while the system is not real time it is very close (circa. 24 hours)⁴⁶.

2021 updates

The Minister of Fisheries and Agriculture decides on the TAC of the cod stock for each fishing year (Sept –Aug) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned below. Before catch is allocated, proportions of the TAC of some species is removed for various reasons such as for the coastal fisheries which any small boat in possession of a licence may access, for research purposes or for chartered angling vessels. On average, catches are within Advice and TAC.

⁹⁴ <https://www.stjornartidindi.is/Advert.aspx?RecordID=42a16a67-60a7-4ae7-ad7c-0f53fc254654>

⁹⁵ <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

⁹⁶ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skrangu-afla>

⁹⁷ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

2.2 Concordance between actual Catch and allowable Catch

Table 14. TACs and actual catches, according to MFRI (source: MFRI, 2021 advice⁹⁸).

Fiskveiðíár Fishing year	Tillaga Recommended TAC	Aflamark National TAC	Afli Catches
2010/2011	40 000	40 000	43 533
2011/2012	40 000	45 000	49 446
2012/2013	67 000	68 500	71 976
2013/2014	87 000	87 000	72 058
2014/2015	83 000	83 200	94 975
2015/2016	71 000	71 000	69 729
2016/2017	63 000	63 000	60 403
2017/2018	38 712 ⁴⁾	39 000	35 034
2018/2019	35 186 ⁴⁾	35 186	40 683
2019/2020	34 572 ⁴⁾	34 572	30 038
2020/2021	35 490 ⁴⁾	35 490	36 100
2021/2022	72 239 ⁴⁾		

⁴⁾ 15% aflaregla. 15% harvest control rule.

References: Please refer to the footnotes and references in the text above, the [summary/background section](#) and the [Reference section](#) at the end of this document.

Statement of continuing consistency to the IRF Fishery Standard The fishery continues to remain consistent with the standard.

7.6.8 Clause 2.3 Monitoring and Control

- 2.3 Monitoring and Control including:
- 2.3.1 Vessel registration and catch quotas
 - 2.3.2 Fishing vessel monitoring and control systems
 - 2.3.3 Catches are subtracted from relevant quotas
 - 2.3.4 Rules are enforced
 - 2.3.5 Analysis is carried out

Summary of relevant changes: Commercial vessels participating in the fishery require a permit issued by the Fisheries Directorate. This is a requirement of the Fisheries Management Act No.116/2006. These permits represent the initial legal requirement without which a vessel may not obtain the quota necessary to fish for Icelandic quota stocks. Quotas conform to the overall decision on TAC, through the individual vessel quota share and other allocations. The headline TAC for a species is determined first and all subsequent allocations are in effect subdivisions of that figure. As a result, the allocated catch quotas for a species (when quotas are initially allocated) are assigned in such a way that the combined quotas for that species conform to the currently effective decision on TAC.

Catches by vessel are monitored and recorded in near real-time in a central database maintained by the Fisheries Directorate⁹⁹. The official weight of the catch is subtracted from that vessels individual quota share for a particular species. The catch quota of each vessel

⁹⁸ <https://www.hafogvatn.is/static/extras/images/22-herring1259461.pdf>

⁹⁹ <http://www.fiskistofa.is/veidar/aflaheimildir/aflahlutdeildalisti/>

<p>2.3 Monitoring and Control including:</p> <p>2.3.1 Vessel registration and catch quotas</p> <p>2.3.2 Fishing vessel monitoring and control systems</p> <p>2.3.3 Catches are subtracted from relevant quotas</p> <p>2.3.4 Rules are enforced</p> <p>2.3.5 Analysis is carried out</p>	<p>or vessel group for each fish species and fishing year is available on the Fisheries Directorate website. For each vessel the information available for each species is:</p> <ol style="list-style-type: none"> 1. Allocated quota (initial allocation of quota from the overall TAC based on no. of shares) 2. Compensations (quota gained/lost through compensations) 3. Quota transferred from the previous year (this may be a negative balance) 4. Quota transferred between vessels (a negative balance indicates an outward transfer of quota (i.e. quota transferred to other vessels) while a positive balance indicates an inward transfer of quota (i.e. quota gained from other vessels) 5. Allowed catch (the sum of 1 to 4 above) 6. Catch (vessels landings in the season to date of that species) 7. Balance (Allowed catch - Catch) 8. Overfished <p>Specific data on each Icelandic quota species, its allocation to ITQ holders, transfer information, balances and catches to date is available at http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en. Registered catches are based on information from ports of landing and information on catches exported unprocessed. The catch statistics are published, subject to change, once they have been compared to submitted logbooks and reports from buyers, and are available on the Fisheries Directorate website. Accordingly, information on the size and composition of the fleet of fishing vessels is available and documented, and the catch quota of each vessel or vessel group, along with the fishing year is recorded in the official central database (GAFL) in a transparent manner and is publicly accessible.</p> <p>The Icelandic Coast Guard, working closely with the Fisheries Directorate, administers an integrated monitoring, control and surveillance system which covers the activities of Icelandic and foreign fishing vessels, using VMS for all Icelandic vessels and for all foreign vessels. Fishing gear is subject to inspection, as well as the composition of the catch and its handling onboard the fishing vessels. At-sea inspections are undertaken during boardings by the Coast Guard and on fishing trips accompanied by the inspectors of the Fisheries Directorate. The Coast Guard undertakes unannounced inspections at sea and check logbooks during these boardings. Fisheries Directorate inspectors also make unannounced checks of logbooks during port inspections. The Coast Guard uses several different but complementary electronic vessel monitoring systems including satellite-based systems comprising VMS and use of satellite imagery, the monitoring of coastal activity through a dedicated land-based very high frequency (VHF) system and the use of the Automatic Identification System (AIS), and more recently drones.</p>
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- 2.3 Monitoring and Control including:
 - 2.3.1 Vessel registration and catch quotas
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 - 2.3.4 Rules are enforced
 - 2.3.5 Analysis is carried out

Deviations and flexibility measures

Data related to landings are processed in the Directorate’s database and catches are subtracted from vessels’ quotas. The system is designed such that reports are received in near real-time so that the Directorate can act quickly if vessels are approaching the end of their quotas. In addition, vessels are aware or can easily check online their current quota status for a particular species. Deviations where they occur can sometimes be rectified using the flexibility within the system (e.g. by using inter-annual, inter-vessel or inter-species transfers to cover catches of a species for which the vessel did not already have quota, or by purchase of additional quota if possible). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines¹⁰⁰.

In addition to the landing, weighing and registration system for catches, export documentation provides an independent comparative check on catch quantities. Analysis of catches includes the comparison of reported catches with the amount of sold or exported products to verify independently that reported landings aligned accurately with those reported. If comparison reveals discrepancies in reported and actual landings received from quayside weighing by registered weighers corrective action is taken as appropriate and Fiskistofa can send inspectors to verify for issues.

Updates for 2021

During the November remote site visit Fiskistofa reported that a new data department has been created to allow for further data analysis relating to catch recording and day to day implementation of management measures, ultimately to improve the ability to detect discrepancies and enforce regulations.

Aside from the above, the monitoring and control systems remain largely unchanged since the previous surveillance. The only other update for 2021 relates to the progress to address the minor non-conformance raised against Clause 2.3.2.4 .

Non-conformance #1 (Clause 2.3.2.4: Minor Non-conformance). Although required by legislation, there is some evidence of non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be fully confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks.

¹⁰⁰ <http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Vidurlog>

- 2.3 Monitoring and Control including:
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One important development in terms of corrective action is the development and use of an app to facilitate catch and bycatch recording in smaller vessels. Fiskistofa, the MFRI and the Client group representative confirmed that starting in September 2020, smaller Icelandic vessels are required to log their catches in a phone/tablet app (essentially an e-logbook) which contains information on catch and bycatch, including that of marine mammals and seabirds. This follows regulation 298/2020¹⁰¹. The App also called Afladagbókina or catch diary^{102 103} automatically records the location of the boat during fishing and the captains then records the catch, its condition and by-catch, in a very simple way. The app replaces paper logbooks in the small boat sector, with an electronic catch recording system.

As of November 2021, the system continues to be used in the small vessel sector and catch and bycatch data is being collected by Fiskistofa and the MFRI for management purposes. MFRI staff reported that data from the App is in the process of being made available to the MFRI through MFRI/Fiskistofa IT staff collaboration. Fiskistofa has also reported as part of this 2nd surveillance audit that since the beginning of the App's implementation it has been mandatory to register all catch and bycatch according to regulation 298/2020 and the data is being received by the authorities. Their inspectors have been busy training fishermen and captains at the quaysides during landing, and their helpline was quite busy in the beginning of the coastal fleet season. Also, one physical meeting was held in Akranes with coastal fishermen. A tutorial video on the use of the App was also published on the Fiskistofa website <https://www.fiskistofa.is/ymsaruppl/tilkynningar/afladagbocarapp-myndband> and on the Fiskistofa facebook site¹⁰⁴.

Furthermore, a traceability component to the App has been implemented in April 2021 which is being used to further help with the detection of discrepancies in catch records and to allow better traceability across the supply chain. This traceability component is currently subject to further development.

Status: Open, Corrective Actions in place to be reviewed annually in subsequent audits. Corrective actions are deemed to be on track.

A corrective action plan against this non-conformance has been provided under the [Non Conformances and Corrective Action Section](#) of this report. Please refer to it for further detail on the non-conformance, the corrective action plan and the corrective evidence supplied during this audit.

¹⁰¹ <https://www.reglugerid.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹⁰² <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skrangu-afla>

¹⁰³ <https://www.mbl.is/200milur/frettir/2020/08/31/oll-aflaskraning-rafraen-fra-og-med-morgundeginum/>

¹⁰⁴ <https://www.facebook.com/Fiskistofa-1151844504903713/videos/304666984614930/>

2.3	Monitoring and Control including: 2.3.1 Vessel registration and catch quotas 2.3.2 Fishing vessel monitoring and control systems 2.3.3 Catches are subtracted from relevant quotas 2.3.4 Rules are enforced 2.3.5 Analysis is carried out
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

Section 3. Ecosystem considerations

7.6.9 Clause 3.1 Guiding Principle

3.1 Guiding Principle

Summary of relevant changes: **Associated species catch and bycatch to the fishery**
 The fishery has been dominated by pelagic trawls in recent years, but both purse seine and pelagic trawls are considered ‘clean’ fisheries with relatively little bycatch. The bycatch species /associated catch to the ISS herring fishery are blue whiting, capelin, mackerel and Norwegian spring spawning herring. The status of these species has been updated and is shown below.

Status of bycatch and associated species in the ISS herring target and non-target fisheries as identified during the full assessment from historic average catches for each relevant gear type. All data and information is derived from the MFRI Advice page¹⁰⁵ for each individual species.

KOLMUNNI – BLUE WHITING (*Micromesistius poutassou*)¹⁰⁶

Fishing pressure on the stock is above FMSY and between Fpa and Flim; spawning-stock size is above MSY Btrigger, Bpa and Blim.

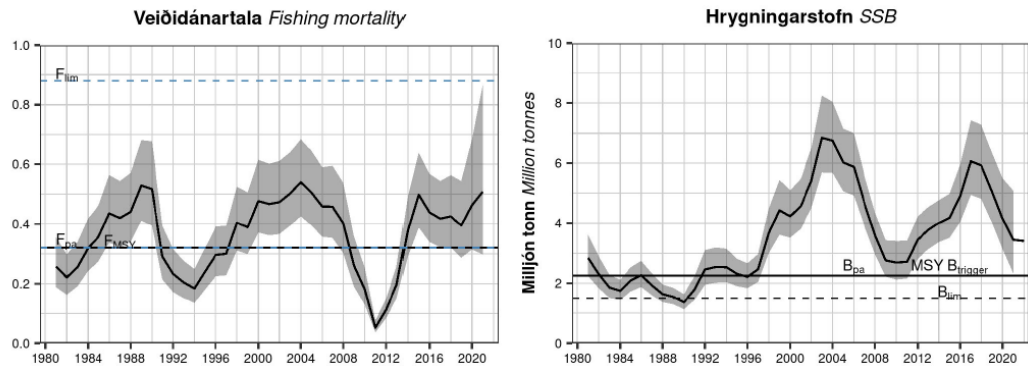


Figure 27. Blue whiting harvest rate and biomass.

LOÐNA – CAPELIN (*Mallotus villosus*)¹⁰⁷

According to the 2021 acoustic autumn survey, the SSB is estimated 1 833 000 tonnes. The harvest control rule (HCR) aims at leaving at least 150 000 tonnes (Blim) of mature capelin at the time of spawning in March with 95% probability. Model projections show that with maximum catch of 904 200 tonnes during the fishing season 2021/2022, the HCR goal will be achieved. The index of immature capelin (age 1 and 2) was the third highest in the time series.

¹⁰⁵ <https://www.hafogvatn.is/en/harvesting-advice>

¹⁰⁶ https://www.hafogvatn.is/static/extras/images/kolmunni_20211278352.pdf

¹⁰⁷ <https://www.hafogvatn.is/static/extras/images/lodnahaust20211278547.pdf>

3.1 Guiding Principle

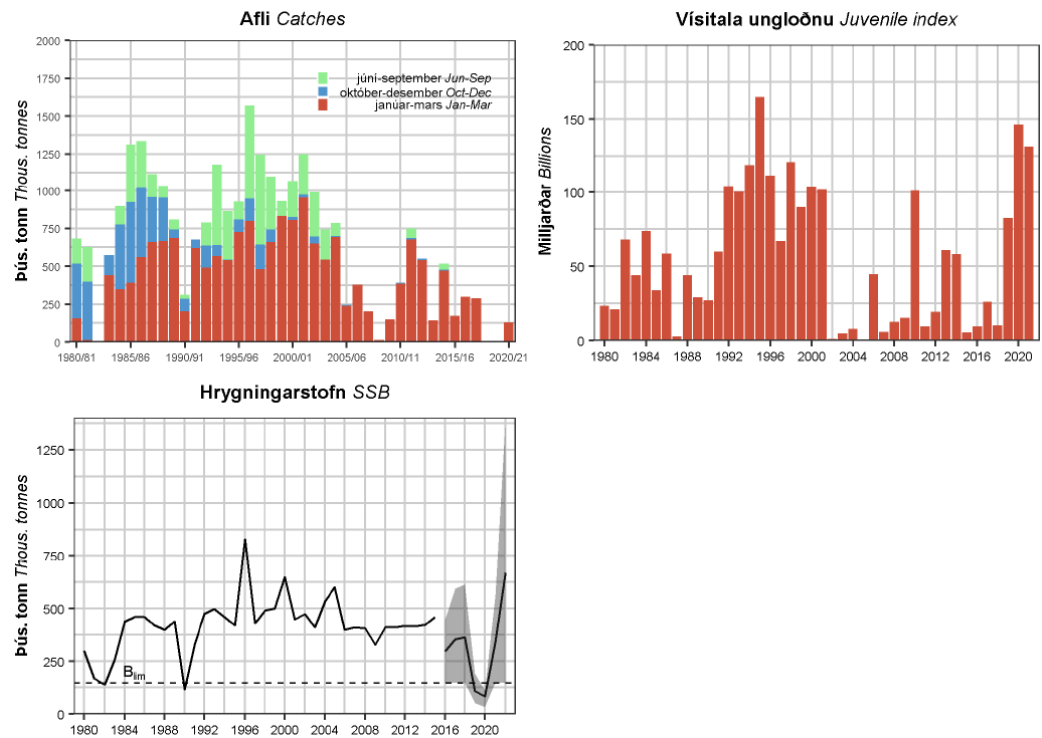


Figure 28. Capelin. Catches, acoustic index for immatures from autumn surveys, and SSB at spawning time after harvesting (with 90% confidence limits since 2016). The SSB value for 2016 and onwards is not directly comparable to historical values because it is based on different assumptions about natural mortality.

MAKRÍLL – MACKEREL (*Scomber scombrus*)¹⁰⁸

The spawning-stock biomass (SSB) is estimated to have increased since 2007, reaching a maximum in 2014, and has been declining since then. It has, however, remained above MSY Btrigger since 2008. Fishing pressure on the stock is below FMSY and spawning-stock size is above MSY Btrigger, Bpa, and Blim.

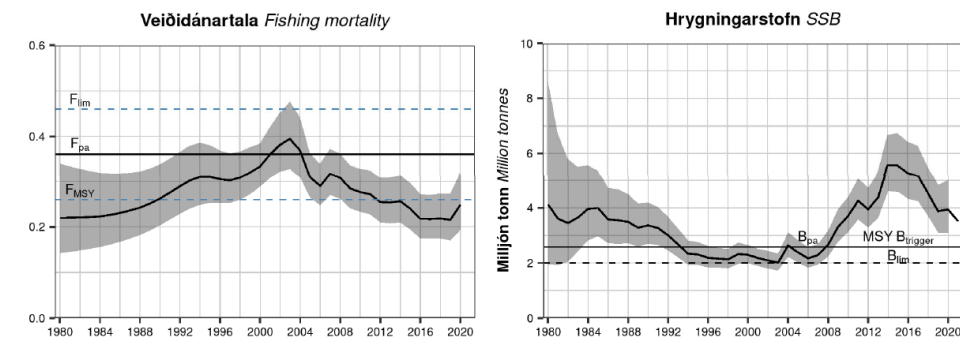


Figure 29. Mackerel harvest rate and biomass.

¹⁰⁸ https://www.hafogvatn.is/static/extras/images/makrill_20211278360.pdf

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NORSK-ÍSLENSK VORGOTSSÍLD NORWEGIAN SPRING-SPAWNING HERRING (*Clupea harengus*)¹⁰⁹

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. Fishing pressure on the stock is above FMSY but beneath Flim. Spawning-stock size is above MGT B trigger, Bpa, and Blim.

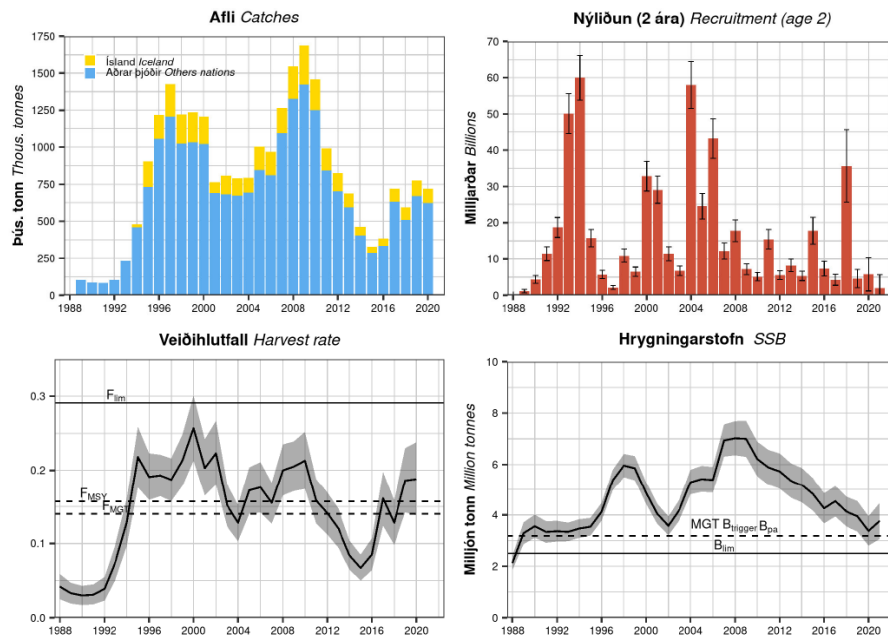


Figure 30. Catches, recruitment at age 2, fishing mortality and spawning stock biomass (SSB). Assessment run starts in 1988, when the stock has started to rebuild after collapse in the 1960s.

Endangered, Threatened and Protected (ETP) and vulnerable species interactions

The discard prohibition only applies to commercially important species and protected species including Atlantic halibut (*Hippoglossus hippoglossus*)¹¹⁰ and porbeagle (*Lamna nasus*), basking shark (*Cetorhinus maximus*) and spurdog (*Squalus acanthias*)¹¹¹ unless they are captured alive in which case they must be released and systematic recording of non-commercial by-catch has not occurred. Measures have been taken in recent years to extend the inspector programme to cover by-catch such as elasmobranchs (pers. comm. MFRI, site visit) and records for by-catch species including skate (*Dipturus batis*), Atlantic halibut, dogfish, Greenland shark (*Somniosus microcephalus*) and porbeagle (*Lamna nasus*) can be seen in the catch data available via the Directorate website (<http://www.fiskistofa.is/english/quotas-and-catches/catches-in-individual-species/>).

These are seen to be either vulnerable or endangered, threatened or protected (ETP)

¹⁰⁹ https://www.hafogvatn.is/static/extras/images/sild-ni_20211278350.pdf

¹¹⁰ Regulation 470/2012. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302>

¹¹¹ Regulation 456/2017. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017>

3.1 Guiding Principle

species. However, these species are unlikely to interact significantly with the gears used in the ISS herring fishery and in the last 5 year, there were no landings of these species reported in pelagic gears (2017 to 2021) based on Fiskistofa records.

ISS herring is important for killer whale (*Orcinus orca*) which in Iceland mainly prey upon herring and mackerel. There are on-going studies documenting this association (Sammara *et al.*, 2017 cited in¹¹²). Fishermen report that killer whale are generally not seen during trawling for ISS herring. They are frequently observed during the purse seine fishery but fishermen report that interactions with the gear are rare. Adult killer whales are generally able to make their own way out of the net but can cause significant damage if they are caught and need to be cut free. If it looks likely that a killer whale will be caught the gear is released to prevent damage to it (pers. com. site visit). In relation to understanding of their population and its status, the last review of killer whales in the North Atlantic dates from 1987. The NAMMCO Scientific Committee recommended in their last meeting that a review be undertaken of all available information and current research activities on abundance, stock structure, and movements of killer whales in the North Atlantic in readiness for their next meeting. Initial abundance estimates for Icelandic waters range from 4,000-6,847 killer whales but these estimates may include killer whales from several populations over large areas. A recent study identified a minimum of 314 individuals regularly using the waters off the southern and west coasts of Iceland (Tavares *et al.*, 2016 cited in¹¹³) and the MFRI, through their long-term killer whale project, have published a catalogue containing over 400 killer whale individuals identified between 2006 and 2015 on their website in 2017. Killer whale research continues in Iceland and is documented in the NAMMCO 2019 Iceland progress report.¹¹⁴ New abundance estimates for killer whales in Icelandic and adjacent areas were published in 2020 (MFRI). The species is listed as 'Least Concern' on the Icelandic (2018) and Norwegian (2015) national red lists and as 'Data Deficient' on the IUCN Red List for both the European and global stock in the most recent assessments (2007 and 2017, respectively)¹¹⁵.

Although evidence of the degree to which ISSH fisheries and marine mammals interact is sparse, available evidence would indicate that, in Icelandic waters, direct mortality of marine mammals as a result of interactions with pelagic fishing gears used in the fishery is likely to be low and unlikely to have detrimental effects at the population level.

Notwithstanding the above we provide here below some updates on vulnerable and ETP species bycatch that have a bearing on information availability from the Icelandic fleets and risk from the most important gear types (gillnet and longline).

Harbour Porpoises (*Phocoena phocoena*)

¹¹² NAMMCO (2017). North Atlantic Marine Mammal Commission. Report of the 24th Scientific Committee meeting, 14-17 November 2017. <https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf>

¹¹³ NAMMCO <https://nammco.no/topics/killer-whale/#1475844082849-433d5060-e5a9>

¹¹⁴ https://nammco.no/wp-content/uploads/2020/03/npr-is_national-progress-report-2019-iceland_nammco28-20205.pdf

¹¹⁵ <https://nammco.no/topics/killer-whale/>

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Harbour porpoises are classified as Least Concern in the IUCN Red List¹¹⁶ (population trend unknown, last assessed in 2020). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)¹¹⁷. Annual estimates of harbour porpoise by-catch have decreased in recent years as gillnet effort has decreased, from a high of 7,300 animals in 2003 to about 1600 animals in 2009–2013¹¹⁸ and down to about 750 animals in 2014-2015.

The latest Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise (19-22 March 2019)¹¹⁹ reported the following about the Icelandic harbour porpoise population.

After reviewing the assessment and noting the recent decline in by-catch, the WG agreed that there was no specific cause for concern for harbour porpoises in Iceland. However, they also concluded that the lack of time and expertise meant they were not in a position to provide management advice on sustainable removals.

An aerial survey in Iceland is planned for harbour porpoise in 2023.

Harbour seals

The MFRI 2021 advice for harbour seals¹²⁰ indicates that the 2020 harbour seal census resulted in a population estimated of 10,319 animals (95% confidence intervals: 6,733-13,906). The current population estimate is 69% lower than the first abundance estimate from 1980 and the estimate is 14% under the management objective of 12 thousand. Animals (Hafrannsóknastofnun 2021). In 2019, new regulation regarding seal hunting in Iceland was enacted (Atvinnuvega- og nýsköpunarráðuneytið 2019). All seal hunting is banned, but it is possible to obtain an exemption for traditional hunt. It is also forbidden to sell Icelandic seal products. Bycatch in gillnets is probably the highest mortality risk for harbour seals in Iceland currently. Limited data are available on seal bycatch, but data collected by on-board observers of the Directorate of Fisheries, and in the MFRI gillnet survey, indicate that on average, 1389 (coefficient of variation, CV=35) harbour seals have been bycaught annually in the lumpfish fishery between 2014 and 2018. Bycatch in cod gillnet fishery and bottom trawls is less common and more uncertainty associated with the bycatch estimates in those fisheries. Between 2014 and 2018, it has been estimated that annually, 15 harbour seals were bycaught in cod gillnet fisheries (CV=102) and 17 harbour seals in bottom trawls (CV=100) (Hafrannsóknastofnun, 2019). Negative effects from the cod gillnet fisheries (and associated fisheries that land fish in those nets) are considered to be very limited.

Other marine mammals

¹¹⁶ <https://www.iucnredlist.org/species/17027/50369903>

¹¹⁷ <https://www.ni.is/node/27406>

¹¹⁸ Pálsson ÓK, Gunnlaugsson Th, and Ólafsdóttir D. 2015. By-catch of seabirds and marine mammals in Icelandic Fisheries. Marine Research no 178. <https://www.hafogvatn.is/static/research/files/fjolrit-178pdf>

¹¹⁹ https://nammco.no/wp-content/uploads/2019/02/final-report_hpwg-2019.pdf

¹²⁰ <https://www.hafogvatn.is/static/extras/images/radgjof-landselur20201286028.pdf>

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The MFRI confirmed that no interaction with Blue whales and Northern right whales recorded in recent years.

There are no further updates from NAMMCO or the MFRI in relation to other marine mammal species (i.e. seals), aside from what we reported in the previous surveillance report.

Pingers testing

The MFRI has been conducting pinger/acoustic device testing in gillnet fisheries for several years now, with mixed results. The last device tested in 2019-2020 showed promise, and publication on the results and possible larger scale trials were planned for 2021 (MFRI, personal communication, November 4th 2021).

Sharks

Generally speaking, landed catches of sharks remain quite small. Some catch of leaf scale gulper sharks has been recorded, last in 2016. Grey skate (*Dipturus flossada / batis*) landed catch in 2019 was 194 t, and 160 t in 2020. Survey abundance is variable but has been on average relatively stable in recent years. Landed catch of dogfish (*Squalus acanthias*) was 1 t in 2019 and 3 t in 2020. Survey trends are very sporadic. Landed catch of Greenland shark (*Somniosus microcephalus*) was 6 t in 2019 and 2 t in 2020. Survey trends are also very sporadic. Landed catch of porbeagle in 2019 was 2.6 t and 3.6 t in 2020. Porbeagles (*Lamna nasus*) are rarely caught in surveys, but two were caught in the autumn survey in 2021 and one in the gillnet survey in 2019.

Trawl effort spatial extent

The ICES 2020 Icelandic ecosystem overview report¹²¹ indicates that within the ecoregion, abrasion caused by bottom trawls has been shown to impact fragile three-dimensional biogenic habitats in particular (e.g. sponge aggregations, coral gardens, and coral reefs), with impacts happening mainly in deeper waters (> 200 m). Effects of bottom trawling on soft substrates in shallow waters have been shown to be minor. Other impacts involve overturning boulders, scouring the seabed, and direct removal of and/or damage to epifaunal organisms.

Using vessel monitoring system (VMS) and logbook data ICES estimates that mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category have been deployed over approximately 132,485 km² of the ecoregion in 2018, corresponding to ca. 17.5 % of the ecoregion's spatial extent. A map of spatial distribution of bottom trawl effort is shown below. The Icelandic bottom trawl fleet consists of about 50 vessels (30–80 m length) fishing mainly for cod, haddock, saithe, redfish, and Greenland halibut.

However, the herring fishery, given the gear used is not considered to cause any significant damage to marine habitats.

Foodweb considerations

¹²¹ https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/EcosystemOverview_IcelandicWaters_2020.pdf

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	In Icelandic waters herring are both a major predator of zooplankton and an important prey species with numerous species of fish, marine mammals and seabirds all being major predators of herring. Herring therefore, are an important part of the ecosystem with many trophic connections. However, the Icelandic marine ecosystem is not considered to be wasp-waisted due to the presence of several other abundant, high biomass, low trophic level stocks including capelin, mackerel and blue whiting. These other abundant high biomass stocks demonstrate similar levels of trophic connectivity and provide alternative pathways through which energy can be transferred to higher trophic levels. This was shown in a study by Stulodottir et al. in 2018 ¹²² in an ‘end-to-end’ dynamic ecosystem model of Icelandic waters using the Atlantis framework. In addition, predators of herring are primarily highly mobile, opportunistic feeders that are not reliant exclusively on herring as a food source. The ISS herring stock biomass has been significantly above precautionary limits in recent years reaching its highest estimated levels in the late 2000s before falling recently due to high natural mortality caused by an <i>Ichthyophonus</i> infection and poor recruitment. Given the current management regime and based on the harvest strategy assumptions, there is little risk of Icelandic fisheries reducing herring stocks to the point where populations of dependent predators would be adversely affected. The stock is currently above MSY Btrigger as of 2021 ¹²³ , and spawning stock biomass is expected to increase in the coming years due to better recruitment and large incoming year classes. Available evidence would suggest that indirect impacts of ISS herring fisheries are unlikely to have severe adverse impacts on dependent predators and the integrity of the stock’s role in the marine ecosystem is most likely protected.
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

7.6.10 Clause 3.2 Specific Criteria

3.2 Specific Criteria including:	
	3.2.1 Information gathering and advice
	3.2.2 By-catch and discards
	3.2.3 Habitat Considerations
	3.2.4 Foodweb Considerations
	3.2.5 Precautionary Considerations
Summary of relevant changes:	Context and updates Information is available on the legal specification of fishing gear in the Icelandic groundfish fishery. The primary aim of fishing gear regulations is size selectivity with a secondary aim being species selectivity. Gears are regulated in several ways to regulate both size and species selectivity. The MFRI provide advice for 40 fish stocks in Iceland as well as advice for harvest of marine mammal species (e.g. fin whale and common minke whale). Their most

¹²² <https://www.sciencedirect.com/science/article/pii/S0165783618301620>

¹²³ <https://www.hafogvatn.is/static/extras/images/22-herring1259461.pdf>

- 3.2 Specific Criteria including:
 - 3.2.1 Information gathering and advice
 - 3.2.2 By-catch and discards
 - 3.2.3 Habitat Considerations
 - 3.2.4 Foodweb Considerations
 - 3.2.5 Precautionary Considerations

recent advice(i.e. 2021), which include results of routine monitoring and assessment efforts is available online at <https://www.hafogvatn.is/en/harvesting-advice>. The Directorate of Fisheries monitors catches of a larger suite of species (many of them non-target species) including starry ray/thorny skate, common skate, dogfish, Greenland shark, Porbeagle shark, Atlantic halibut, orange roughy, shagreen ray, etc... Catch records for over 50 species can be retrieved on their website.¹²⁴

There have been no changes in the gear used in Icelandic waters. Fiskistofa and the Client group confirmed that longliners use night settings and lasers of sounds cannons to keep birds off the longlines, while trawlers use semi-pelagic trawl doors and rock hoppers to decrease drag on the seabed to save fuel and decrease gear habitat contact. Gillnetters are mainly restricted through area closures.

The status of bycatch and associated species has been detailed in the previous clause. Vulnerable species effects are considered generally limited and not significantly affecting any of the species listed by OSPAR, or the marine mammals and seabirds regularly caught in the gillnet fisheries (mostly in lumpfish).

According to section 2 of Act no. 57/1996, concerning the treatment of commercial marine stocks, discard of catches (although with minor exceptions) is prohibited, hence the very vast majority if not all catches are landed. Actual discards are illegal and considered relatively small in Icelandic waters. Discarding violations are subject to penalty ranging from ISK 400K to 8M. One feature of this ban is that it has some inbuilt flexibility, as a small percentage of catches from a fishing trip (called VS catch), irrespective of fish species or size, may be excluded from quota restriction (which means that VS catches are additional to the TAC). On sale of VS catches in public fish markets 20% of the revenue generated is paid to the vessel with the remaining 80% going to a designated research and development fund (the VS fund, under the auspices of the Ministry). A maximum of 20% return on VS catches means that there are limited incentives for fishermen to land such catches.

Habitat considerations are listed in the yearly ICES ecosystem report for the Icelandic waters, the last of which was published in December 2020¹²⁵. The effects of the herring fishery are not considered to be significant as the gear does not generally come in contact with the seabed.

¹²⁴ <http://www.fiskistofa.is/veidar/aflastada/aflastodulisti/>

¹²⁵ https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/EcosystemOverview_IcelandicWaters_2020.pdf

<p>3.2 Specific Criteria including:</p> <ul style="list-style-type: none"> 3.2.1 Information gathering and advice 3.2.2 By-catch and discards 3.2.3 Habitat Considerations 3.2.4 Foodweb Considerations 3.2.5 Precautionary Considerations 	
	<p>Foodweb considerations</p> <p>In Icelandic waters herring are both a major predator of zooplankton and an important prey species with numerous species of fish, marine mammals and seabirds all being major predators of herring. Herring therefore, are an important part of the ecosystem with many trophic connections. However, the Icelandic marine ecosystem is not considered to be wasp-waisted due to the presence of several other abundant, high biomass, low trophic level stocks including capelin, mackerel and blue whiting. These other abundant high biomass stocks demonstrate similar levels of trophic connectivity and provide alternative pathways through which energy can be transferred to higher trophic levels. This was shown in a study by Stulodottir et al. in 2018¹²⁶ in an ‘end-to-end’ dynamic ecosystem model of Icelandic waters using the Atlantis framework. In addition, predators of herring are primarily highly mobile, opportunistic feeders that are not reliant exclusively on herring as a food source. The ISS herring stock biomass has been significantly above precautionary limits in recent years reaching its highest estimated levels in the late 2000s before falling recently due to high natural mortality caused by an <i>Ichthyophonus</i> infection and poor recruitment. Given the current management regime and based on the harvest strategy assumptions, there is little risk of Icelandic fisheries reducing herring stocks to the point where populations of dependent predators would be adversely affected. The stock is currently above MSY Btrigger as of 2021¹²⁷, and spawning stock biomass is expected to increase in the coming years due to better recruitment and large incoming year classes. Available evidence would suggest that indirect impacts of ISS herring fisheries are unlikely to have severe adverse impacts on dependent predators and the integrity of the stock’s role in the marine ecosystem is most likely protected.</p>
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

¹²⁶ <https://www.sciencedirect.com/science/article/pii/S0165783618301620>

¹²⁷ <https://www.hafogvatn.is/static/extras/images/22-herring1259461.pdf>

8 Update on compliance and progress with non-conformances and agreed action plans

This section details compliance and progress with non-conformances and agreed action plans including:

- a) A review of the performance of the Client specific to agreed corrective action plans to address non-conformances raised in the most recent assessment or re-assessment or at subsequent surveillance audits including a summary of progress toward resolution.
- b) A list of pre-existing non-conformances that remain unresolved, new nonconformances raised during this surveillance, and non-conformances that have been closed during this surveillance.
- c) Details of any new or revised corrective action plans including the Client’s signed acceptance of those plans.
- d) An update of proposed future surveillance activities.

During the full assessment audit¹²⁸ of this fishery in 2019 (of the first certification cycle), all clauses but one was found to be in full conformance. In this respect, one minor non-conformance was identified against clause 2.3.2.4 of the IRFM Standard (V2), relating to the appropriate recording of marine mammal and seabird bycatch data in fishing logbooks. Progress against the NCs for this 2nd Surveillance is shown below. No new non-conformances were identified during the current Surveillance.

Non-conformance 1 (of 1)	
Clause:	2.3.2.4. Catch amounts by species and fishing area shall be estimated and continually recorded in fishing logbooks on-board the fishing vessels
Non-conformance level:	Minor Non-conformance
Non-conformance:	Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks.
Rationale:	<p>The recording of marine mammals and seabirds by number and species is required by Icelandic regulation¹²⁹. Despite the implementation of new mandatory logbook reporting procedures for seabird and marine mammal bycatch, available evidence suggests that far fewer incidences of seabird and marine mammal bycatch are reported via the electronic logbook system than would be expected given the levels reported by onboard observers. This suggests significant levels of under-reporting and/or non-reporting of seabird and marine mammal bycatch. Examples of available evidence to support this conclusion include the findings of Pallson <i>et al.</i> 2015¹³⁰ and the March 2018 MFRI report titled: “Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017”.</p> <p>Pallson <i>et al.</i> 2015 highlighted the fact that their bycatch estimates were based on limited data that needed to be increased and improved with a functioning reporting system for the fishery and better follow up.</p>

¹²⁸ <https://www.responsiblefisheries.is/media/1/form-11.2-iceher-initial-assessment-final-report-and-determination.pdf>

¹²⁹ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967>

¹³⁰ <https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf>

	<p>The MFRI 2018 report found that although reported bycatch in E-logbooks by the fleet has increased (suggesting better compliance with reporting requirements) the overall bycatch rates are still much lower than observed in the trips by inspectors. Overall, the marine mammal and seabird bycatch rate during inspector trips was around four times higher than reported by the fleet in 2017¹³¹.</p> <p>Furthermore according to a 2017 presentation to NAMMCO’s Working group on bycatch of marine mammals; <i>“logbooks have unfortunately proven unreliable”</i> and <i>“bycatch of birds and marine mammals is 18x higher when observer is present vs logbook records”</i>.</p> <p>While much of the evidence related to non-compliance with reporting requirements may relate to the lumpsucker fishery, this fishery is still part of the management system under review and in addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better.</p>
<p>Corrective Action Plan</p>	<p>In accordance with rules of the IRF Programme, the Client is required to submit a Corrective Action Plan (CAP) within 28 days.</p> <p>The Client submitted the following CAP in February 2019</p>

¹³¹ <https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf>



To whom it may concern

ÁTVINNUVEGA-OG
NÝSKÖPUNARRÁÐUNEYTIÐ

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Reykjavík February 15, 2019
Reference: ANR18030330/11.02.09

The Icelandic fisheries management system is based on responsible conservation and sustainable use of living marine resources and an integral part of the system is to manage ecosystem effects of fishing, including bycatches of commercial and non-commercial species. All management decisions are taken based on the best available science.

Effective control and enforcement is a pivotal element of a responsible fisheries management system. The Directorate of Fisheries monitors fisheries to ensure that rules are being followed. Real-time status of landings is delivered to a live database through a synchronized weight control system at all landing ports. The Directorate also carries out surveillance and inspections of the fishing operations, landing of catches and processing plants in close collaboration with the Icelandic Coast Guard, the Food and Veterinary Authority as well as accredited municipal harbor officials responsible for proper recording of the weight of the landed catch.

Icelandic law explicitly prohibits discards of commercial species, i.e. bycatches of unwanted species or undersized fish. There are certain flexibility options and incentives for compliance incorporated into the system, to make it function well in practice.

Incidental catch of non-commercial species such as seabirds and marine mammals is monitored by mandatory recordings in electronic logbooks. These measures are meant to maintain the delicate balance between effective harvesting and good environmental health to support sustainable fisheries.

The Marine and Freshwater Institute in Iceland issues reports on incidental bycatches of non-commercial species. One issue that is currently being addressed as a result of the recommendations of these reports is the need for further measures to encourage the reporting of these catches in logbooks to prevent the transition from paper-logbooks to electronic reporting from resulting in lower levels of reporting. According to the reports from the MFRI, bycatch of marine mammals and seabirds are most frequent in gillnet fisheries.

The Minister of Fisheries recently received a response to his request to the Committee for consultation on responsible management of living marine resources regarding addressing

non-commercial bycatches. On the basis of the conclusions of this committee, work has commenced to improve data recording, data availability and reliability and explore certain management measures to reduce bycatch of these species.

The committee comprises individuals from main stakeholder organizations in the fishing industry as well as the Marine and Freshwater Research Institute and the Ministry of Fisheries.

The Ministry will be working with the MFRI, the Directorate and the fishing industry in the next months with the aim of acquiring accurate and more detailed information on frequency of non-commercial bycatches, by fishing-gear, area and time. This information is essential for the MFRI as basis for recommendation on management actions to address any significant adverse impacts of fisheries on these species in question and the ecosystem health in general. These actions could include time and area closures and fishing gear amendments.

On behalf of the Minister of Fisheries and Agriculture



Brynhildur Benediktsdóttir

Further to the corrective action letter provided, the client also clarified that the Committee has recommended the following to the Ministry of Industries and Innovation:

- 1) Improvement of information collection and monitoring activities to gather reliable seabird and marine mammal bycatch information from vessel e-logbooks (and directly addressing the non-conformance) through technology development (e.g. mobile app in development by the Directorate), a species identification training program for fishermen and observers, and a general improvement in the quality of bycatch data (i.e. narrower confidence limits) and depth of information recorded (e.g. catch information on area, time, depth etc.) to help design mitigation measures that will result in appropriate industry acceptance and buy in;
- 2) Measures to reduce bycatch (e.g. potential spatial/temporal closures at sensitive times such as around seal pupping or bird breeding season); and
- 3) US Marine Mammal Protection Act importing requirements collectively dealt with through improvements in the previous two points (i.e. information gathering and management measures).

	<p>Accordingly, the Ministry is now considering further action with a view to determine what arrangements are realistically achievable and by when, potentially resulting in the following corrective action timelines:</p> <p>Year 1: Ongoing work to further refine the actions identified above in terms of specific deliverables with their accompanying timeline; Year 2: Initiate deliverable x, y, z identified in Year 1; Year 3: Fully implement and report on progress; Year 4: Continued implementation and reporting.</p>																														
<p>Assessment Team CAP response</p>	<p>The Assessment Team has accepted the Corrective Action Plan provided by the Client for the fishery under assessment.</p>																														
<p>Progress at 1st Surveillance (2021) – year 1</p>	<p>During the 2021 remote audit, Fiskistofa confirmed that starting in September 2020 smaller Icelandic vessels (including gillnetters that are responsible for most of the recognised bycatch of marine mammals and seabirds) are now required to log their catches in an app (essentially a e-logbook) which contains information on catch and bycatch, including that of marine mammals and seabirds. This follows regulation 298/2020¹³². The App was designed and trialled between 2018 and 2020. The App also called Afladagbókina or catch diary¹³³ automatically records the location of the boat during fishing and the captains then records the catch, its condition and by-catch, in a very simple way. The app replaces paper logbooks in the small boat sector, with an electronic catch recording system. It is expected that this app will make the recording of bycatch easier for the fleet.</p> <p>Additionally, the MFRI has provided the latest (available) reported bycatch from the fishing fleet by gear. They report that (as somewhat expected) logbook records were generally much lower than the estimated bycatch. As an example, the total bycatch of reported harbour porpoises in the gillnet fishery over the 4 years was 171 porpoises while the total observed by inspectors and in the MFRI cod gillnet survey (3.7% of total effort) was 119 porpoises (yearly).</p> <p>Bycatch of marine mammals and seabirds by gear type in 2016-2019 as reported by the fishing fleet. Source MFRI, January 2021.</p> <table border="1" data-bbox="381 1409 1219 1709"> <thead> <tr> <th colspan="6">Cod and Greenland halibut gillnets</th> </tr> <tr> <th>Species</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Harbour porpoise</td> <td>52</td> <td>45</td> <td>48</td> <td>26</td> <td>171</td> </tr> <tr> <td>White beaked dolphin</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>Harbour seal</td> <td>11</td> <td>12</td> <td>7</td> <td>8</td> <td>38</td> </tr> </tbody> </table>	Cod and Greenland halibut gillnets						Species	2016	2017	2018	2019	Total	Harbour porpoise	52	45	48	26	171	White beaked dolphin	1	0	0	1	2	Harbour seal	11	12	7	8	38
Cod and Greenland halibut gillnets																															
Species	2016	2017	2018	2019	Total																										
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¹³² <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹³³ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

¹³⁴ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

Grey seal	4	1	1	1	7
Harp seal	2	0	0	0	2
Ringed seal	0	0	0	1	1
Humpback whale	1	0	0	0	1
Northern bottlenose whale	0	0	1	0	1
Risso's dolphin	0	0	7	0	7
Total marine mammals	71	58	64	37	230
Common guillemot	32	40	35	38	145
Northern fulmar	0	2	0	0	2
Brünnich's guillemot	0	0	0	3	3
Black guillemot	0	2	0	26	28
Cormorants	0	1	2	4	7
Total seabirds	32	45	37	71	185
Demersal longline					
Species	2016	2017	2018	2019	Total
Northern fulmar	61	303	539	195	1098
Northern gannet	0	27	3	0	30
Seagull species	25	8	3	0	36
Total seabirds	86	338	545	195	1164
Demersal otter trawl					
Species	2016	2017	2018	2019	Total
Harbour seal	0	0	3	1	4
Unidentified dolphin	0	0	1	0	1
Total marine mammals	0	0	4	1	5
Northern gannet	0	0	0	3	3
Total seabirds	0	0	0	3	3

All in all, it is expected that the new App will facilitate more precise data collection from the (small boat) fleet. Further progress will be measured at each subsequent surveillance.

Assessment Team Determination on year 1, 1st Surveillance (2021) Corrective Evidence	<p>The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 1 and 2. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 2nd surveillance activities will review evidence that the corrective actions highlighted above have been carried out.</p>
Year 2 progress (2nd Surveillance, late 2021)	<p>As of November 2021, the App continues to be used in the small vessel sector and catch and bycatch data is being collected by Fiskistofa and the MFRI for management purposes. MFRI staff reported that data from the App is in the process of being made available to the MFRI through MFRI/Fiskistofa IT staff collaboration, although timelines for completion are unclear as of November 2021. Fiskistofa has also reported as part of this 2nd surveillance audit that since the beginning of the App's implementation it has been mandatory to register all catch and bycatch according to regulation 298/2020 and the data is being received by the authorities. Their inspectors have been busy training fishermen and captains at the quaysides during landing, and their helpline was quite busy in the beginning of the coastal fleet season. Also, one physical meeting was held in Akranes with coastal fishermen. A tutorial video on the use of the App was also published on the Fiskistofa website https://www.fiskistofa.is/ymsaruppl/tilkynningar/afladagbocarapp-myndband and on the Fiskistofa Facebook site¹³⁵.</p> <p>Furthermore, a traceability component to the App has been implemented in April 2021 which is been used to further help with the detection of discrepancies in catch records and to allow better traceability across the supply chain. This traceability component is currently subject to further development.</p>
Assessment Team Determination on Year-2 Corrective Evidence	<p>The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 2. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 3rd surveillance activities will review evidence of continuous implementation of the App in the small vessel sector.</p>

8.1.1 Update on Recommendations

Assessment Teams may make Recommendations in areas where conformity to the RFM Standard could be improved. While Recommendations do not require Corrective Action Plans, the issues highlighted in these recommendations may be reviewed at surveillance audits.

¹³⁵ <https://www.facebook.com/Fiskistofa-1151844504903713/videos/304666984614930/>

Recommendation 1 (of 1)	
Clause:	1.3.1.2
Recommendation:	At present, the management plan does not have an explicit revision clause; therefore, the Assessment Team recommends that a revision clause be incorporated in the management plan, to account for situations where SSB approaches B_{lim} . This is also important because the harvest rule does not specify a reduction in harvest rate before B_{lim} is reached, and simulations did not take into account declining recruitment in the last decade.
Rationale:	Reducing the harvest rate before B_{lim} is reached
Progress against Recommendation:	The assessment team is not available of any relevant progress.

9 Recommendations for continued certification

9.1 Certification Recommendation

Following this surveillance audit, the Assessment Team recommends that the fishery be awarded continuing certified against the IRF Responsible Fisheries Management Standard Revision 2.0.

9.2 Certification Committee Determination

The involvement of a Certification's Certification Committee is only required where one or more new non-conformances are raised during a Surveillance Audit.

As no new non-conformances were raised during this Surveillance Audit, the involvement of a Global Trust's Certification Committee is not required; therefore, the above recommendation of the assessment team constitutes a Determination.

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10.1 Appendix 1 – Assessment Team Bios

Based on the technical expertise required to carry out this assessment, an Assessment Team was selected as follows.

Vito Romito, Lead Assessor

Vito has 10 years of expertise in fisheries certification and is an ISO14001 Certified Lead Auditor and MSC FCR v.2.0 and FCP v.2.1 approved Fisheries Team Leader for SAI Global with extensive experience in ecosystems effects of fisheries. Vito received a BSc (Honours) in Ecology and a MSc in Tropical Coastal Management from Newcastle University (U.K.), in between which he worked for a year in Tanzania, carrying out comparative biodiversity assessments of pristine and dynamited coral reef ecosystems around the Mafia Island Marine Park. For five years he worked at Global Trust Certification/ later SAI Global as Lead Assessor for all the fishery assessments in Alaska, Iceland and Louisiana. Vito has also carried out several IFFO forage fisheries assessments in Chile, Peru, Europe and other various pre-assessments in Atlantic and Pacific Canada. To date, Vito has headed and conducted dozens of assessments involving 40+ different species including salmonid, groundfish, pelagic, flatfish, crustacean and cephalopod species in Europe, North and South America, and SE Asia. For three years, as a senior fisheries consultant and then manager with RS Standards Ltd., he was involved in the development and testing of a Data Deficient Fisheries framework and v.2.0 fisheries standard for the ASMI Alaska RFM Scheme, and IFFO RS Improver/FIP projects related to South East Asia multispecies bottom trawl fisheries. Vito re-joined the SAI Global Fisheries Team in 2018 and has since been involved in MSC and RFM fisheries assessments in Canada, New England, Iceland, Alaska and Louisiana, the Baltic Sea, Ireland and Italy.

Dankert Skagen, Assessor

Dankert retired from the Institute of Marine Research (IMR), Bergen in 2010, where he worked for 22 years. His responsibilities included stock assessment, multispecies work, in particular in the North Sea, work connected to the introduction of the precautionary approach in fisheries and more recently, on development of harvest control rules and management strategies.

He was leader of the IMR research program for population dynamics and multispecies investigations in 1996-97 and for the development of new assessment tools for North-East arctic cod in 1998-99 and the assessment package TASACS in 2007-08. In addition, he has developed several programs for simulating harvest control rules that are commonly used in fisheries management today. Within ICES, he has participated in a wide range of working groups and has been chairman of several of them, including the Study Group of Management Strategies. He was chairman of the Resource Management Committee for 3 years and member of ACFM for 7 years. Dankert has been involved with sustainability assessment of Icelandic fisheries for 10 years.