Iceland Responsible Fisheries (IRF) Certification Programme

1st Surveillance Assessment Report

Of The

Icelandic Summer Spawning Herring Commercial Fishery

Facilitated By

Iceland Responsible Fisheries Foundation (IRFF)

Assessors: **Vito Romito, Lead Assessor**
Dankert Skagen, Assessor

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ICELAND RESPONSIBLE FISHERIES
CERTIFIED

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i Summary and Recommendations

The Fisheries Association of Iceland on behalf of the Federation of Icelandic Fishing Vessel Owners (LÍÚ), the Federation of Icelandic Fish Processing Plants (SF) and the National Association of Small Boat Owners, Iceland (NASBO) requested an assessment of the Icelandic summer spawning herring (*Clupea harengus*) commercial fisheries to the FAO Based Icelandic Responsible Fisheries Management (IRF) Certification Programme. Certification was granted the 23rd August 2019. The purpose of the Programme is to provide the fishing industry with a "Certification of Responsible Fisheries Management" at the highest level of market acceptance. Certification to the Programme demonstrates a commitment that will communicate to customers and consumers the responsibility of fishermen and fisheries management authorities and the provenance of Icelandic fish. The Iceland Responsible Fisheries Foundation, established in February 2011, owns and operates the brand of Iceland Responsible Fisheries.

The Certification Programme is accredited to the international standard ISO/IEC 17065, confirming that consistent, competent and independent certification practices are applied. Formal ISO/IEC 17065 accreditation by an IAF (International Accreditation Forum) Accreditation body gives the Programme formal recognition (since September 2014) and a credibility position in the International marketplace and ensures that products certified under the Programme are identified at a recognised level of assurance. Demonstration of compliance is verified through a rigorous assessment by a competent, third party, accredited certification body, Global Trust Certification. The assessment was conducted by a team of Global Trust appointed Assessors comprising of internal staff and externally contracted fishery experts. Details of the assessment team are provided in Appendix 1.

The unit of certification includes the Icelandic summer spawning (ISS) herring commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls, and indirectly by gears from other Icelandic fisheries legally landing herring within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ).

This Assessment report comprises the 1st Surveillance Report (2021) for Icelandic summer spawning herring, following full assessment and certification in 2019[1]. Therefore, this report monitors for any changes in the management regime, regulations and their implementation, stock assessment and status, and wider ecosystem considerations since the previous audit in 2019. Ultimately, this assessment evaluates whether current practices in the management of the ISS herring fishery remain consistent with criteria contained in Revision 2.0 of the IRF Standard. The assessment was conducted according to the Global Trust procedures for FAO-Based IRFM certification using Version 2.0 of the IRFM Standard (July 2016).

The assessment team recommends that the management system of the applicant fishery, the Icelandic summer spawning (ISS) herring commercial fishery under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls, and indirectly by gears from other Icelandic fisheries legally landing herring within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), is granted continued certification.

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

Conformance against the IRFF Standard V2

During the full assessment audit[2] 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 1st Surveillance is shown in detail in Section 8 Performance specific to agreed corrective action plans.

No new non-conformances were identified during the 1st Surveillance audit.

The Assessment Team has also issued a formal Recommendation for consideration.

Recommendation 1 relevant to clause 1.3.1.2.
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.

[2] https://www.responsiblefisheries.is/media/1/form-11.2-iceher-initial-assessment-final-report-and-determination.pdf

ii Assessment Team Details

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1 Introduction

This surveillance assessment of the Icelandic summer spawning herring commercial fishery fulfils part of the procedure for the continuing certification of the fishery to the Iceland Responsible Fisheries Programme (hereafter IRF Programme). The IRF Programme is a voluntary program for Icelandic fisheries initially established by the Fisheries Association of Iceland (FAI) and now owned and administered by the Iceland Responsible Fisheries Foundation (IRFF). The IRFF was established in February 2011 and operates on a cost basis, as a non-profit organisation.

IRFF wishes to provide the Icelandic fishing industry with a "Certification of Responsible Fisheries Management" at the highest level of market acceptance. The purpose of the Programme is to provide Certification to requirements under the Programme that demonstrates a commitment that will communicate to customers and consumers the responsibility of fishermen and fisheries management authorities and the provenance of Icelandic fish.

This Surveillance Report comprises the 1st Surveillance Report for Icelandic ISS herring (year 2021). Therefore, this report monitors for any changes in the management regime, regulations and their implementation, stock assessment and status, and wider ecosystem considerations since the previous audit, the 2019 Full Assessment[3].

The assessment was conducted according to the Global Trust procedures for FAO-Based IRFM certification using Revision 2.0 of the IRFM Standard (July 2016). The IRFM Standard is based on the 1995 FAO Code of Conduct for Responsible Fisheries and on the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries adopted in 2005 and amended/extended in 2009, which in turn are based on the current suite of agreed international instruments addressing fisheries.

The Assessment is based on the 3 major Sections of responsible fisheries management, as outlined in Revision 2.0 of the IRFM Standard, namely:

Section 1: Fisheries Management
Section 2: Compliance and Monitoring
Section 3: Ecosystem Considerations

[3] https://www.responsiblefisheries.is/media/1/form-11.2-iceher-initial-assessment-final-report-and-determination.pdf

1.1. Recommendations of the Assessment Team

The assessment team recommends that the management system of the applicant fishery, the Icelandic summer spawning (ISS) herring commercial fishery under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls, and indirectly by gears from other Icelandic fisheries legally landing herring within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), is granted continued certification.

2 Fishery Applicant Details

Table 1. Fishery 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
E-mail Address		heidrun@sfs.is
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

3 Proposed Unit(s) of Assessment and Certification

The applicant Unit of Assessment (UoA) (i.e., what is to be assessed) is described by the following:

Table 2. Unit of Assessment (UoA).

Unit of Assessment (UoA) 1 – SS Herring		
Species:	**Common name:**	Atlantic herring/herring (Síld)
	Latin name:	*Clupea harengus*
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*

* Comprised of all other gears contributing <1% to total Icelandic landings of the target species.

The applicant Unit of Certification (UoC) (i.e., what is to be covered by the certificate if all Units of Assessment listed above meet the required standard) is described by the following:

Table 3. Unit of Certification.

Unit of Certification (UoC) 1 – SS Herring		
Species:	**Common name:**	Atlantic herring/herring (Síld)
	Latin name:	*Clupea harengus*
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*

* Comprised of all other gears contributing <1% to total Icelandic landings of the target species.

4 Surveillance Meetings

The remote audit for this fishery was conducted from the 11th to the 13th of January 2021. The video call with key Icelandic stakeholders was organized to cover all the certified fisheries under the Icelandic RFM program (concurrently), and included cod, haddock, saithe, Golden redfish, ling, tusk and ISS herring.

Table 4. 1st Surveillance remote audit meetings carried out for the cod, haddock, saithe, Golden redfish, ling, tusk and ISS herring fisheries.

Date	Organization and Location	Representative	Main Topics of Discussion
Monday January 11th2021, 10:00 am	Fisheries Iceland & IRFF Video call	The Client (opening meeting) Kristján Þórarinsson, Fisheries Iceland Finnur Gardarsson, IRF Foundation GT Assessment Team: Vito Romito Dankert Skagen	**1.** Brief review or key highlights of the 2019/2020 fishing season for cod, haddock, saithe, golden redfish, ling, tusk and ISS herring. **2.** Icelandic cod discards have increased trawl (highest on record). Reason? **3.** Any significant changes in the management system, key laws or regulations in the past 12-18 months? **4.** MFRI and ICES advice in 2020. **5.** Any updates from the day to day operations of the large and small fleet sectors? **6.** Plans for revisiting/updating Fishery Management Plans? **7.** Corrective Action relating to Non-Conformance 1: *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, what are the updates, new information or developments addressing the issue? **8.** Corrective Action relating to Non-Conformance 2: *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.* Regarding NC 2, what are the key developments regarding spotted wolffish and common loon? **9.** A smartphone app has been in development for some time by the Directorate of Fisheries to facilitate recording of marine mammal and seabirds' bycatch in smaller vessels. Updates on this item? **10.** Weighing (Fiskistofa). We highlighted in previous assessment reports key findings from the Icelandic National Audit Office (NAO) report from December 2018[4], noting 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. Are you aware of any updates or developments in the past 12-18 months relating to this item? **11.** 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? **12.** Any other changes or updates of mention for the 7 fisheries in question that may relate to day to day operations and industry activities,

[4] https://rikisendurskodun.is/wp-content/uploads/2019/01/Eftirlit-Fiskistofu-Stjornsysluuttekt.pdf

Date	Organization and Location	Representative	Main Topics of Discussion
			management, research, assessment and advice, or mitigation of eco-system effects of fisheries we should discuss?
Monday 11th January 2021, 1.00 pm	Iceland Coast Guard Video call	Iceland Coast Guard (ICG) Björgólfur H. Ingason: Chief Controller, Jón Árni Árnason: Controller GT Assessment Team: Vito Romito Dankert Skagen	**1.** 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? **2.** Has the level of resources and monitoring effort remained the same or has it changed in past 1-2 years? **3.** Have there been changes over 2019/2020 in the systems or patrolling vessels used for enforcement (i.e. new vessels or other)? **4.** How many airborne fisheries patrol hours have been conducted over the last fishing season? **5.** Any other updates regarding enforcement assets (e.g. drones)? Or use of other electronic reporting systems? **6.** Boardings rate and type/ number of violations recorded (in the 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? **7.** How many prosecutions and reprimands made against skippers did these activities (overall enforcement activities) result in? **8.** Are there many violations of fishermen fishing over their TAC? **9.** Enforcement of, and levels of compliance with, logbook reporting of interactions/bycatch between seabirds and marine mammal (especially in gillnets, longlines and trawl gear)? Updates and changes in the past 1-2 years? Any prosecutions for failing to report bycatch? **10.** Have there been any major changes in overall violation/compliance rate in the past 2-3 years? **11.** What is checked when vessels are boarded (gear specs, catch composition, logbook vs actual catches, other)? **12.** Reporting requirements and or issues with lost fishing gear (e.g. longline, gillnets)? **13.** Any changes to the range of monetary and operational penalties for infractions to fisheries regulations? Are there any repeating offenders in Icelandic waters? **14.** Any instances of serious IUU fishing by Icelandic or foreign vessels in the past 2-3 years?
Tuesday 12th January 2021, 2.00 pm	Marine and Freshwater Research Institute (MFRI) Video call	Marine and Freshwater Research Institute (MFRI) Bjarki Elvarsson: Providing stock assessment expertise; Guðjón Már Sigurðsson: Providing bycatch interactions expertise; Steinunn Hilma Ólafsdóttir: Providing ecosystem and benthic effects of fisheries expertise. GT Assessment Team: Vito Romito	**1.** Updates on perception of the state of the stocks (cod, haddock, saithe, redfish, ling, tusk, ISS herring) and performance of their management plans in the past 12-18 months **2.** Rules and regulations affecting these, in the same time period. **3.** Updates of new management regulations **4.** Short term (2/3 weeks) closures by year and species for cod, haddock, saithe, redfish, ling, tusk, herring. **5.** Stock identity: Anything new for any of the stocks (cod, haddock, saithe, redfish, ling, tusk, herring) on sub stock structure, stock units etc? New studies, plans or projects? **6.** Changes in area distributions of the 7 stocks and fisheries. New developments/information in distributions and in causes? **7.** Difference between bottom trawl surveys**:** For many stocks fitting to each of the surveys give different results. The problem exists for several stocks and has been raised on various occasions, but is something being done to understand the cause better? **8.** Retrospective errors. They still are there – this year the tusk is outstanding. Possible reasons? Are the present results more reliable than the past? i.e. is the tusk stock increasing or not? **9.** Sampling: Maps showing the location of catches and of samples are very useful but reveal that in some cases that important hot spots in the fishery apparently do not get covered by the sampling. In particular,

Date	Organization and Location	Representative	Main Topics of Discussion
		Dankert Skagen	that is the case in some long line fisheries, for example for cod (like we see in Figure 9 in the MFRI cod report), but also for other stocks. **10.** Is this a concern? Would that for example make the fitting to length distributions uncertain? Any thoughts about improvements? **11.** We are aware of the system where samples are requested more or less automatically when a certain amount has been caught. Does it always work? Does it operate on fleet basis or area basis or just on total catch? **12.** Adherence to the ICES stock annex (SA) procedures. Are there any other deviations from the latest approved SA than the extension of the age range in survey data for cod? **13.** Status of benchmarks and harvest rule revisions. An overview of plans for all the 7 stocks would be useful. If there already are plans for changes, that would be useful to know. **14.** Discards: We note the increasing trend, in particular for trawl. Why does this happen?? Any new information? Are there indications of trends after the last year examined (2017-2018)? Any plans for new approaches both to enforcement and to measurement. **15.** Spotted wolffish: Is the recruitment failure for that stock real? Is there some clear understanding of the causes? How strong is the need to protect the stock? Ideas for feasible measures to protect it? **16.** Non Conformances (NCs): 2 NCs were identified in previous IRF Full Assessments or carried over from the 4th Surveillance cycle in 2018. **17.** Non Conformance 1: *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? **18.** Non Conformance 2: *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.* Regarding NC 2, what are the key developments regarding spotted wolffish (e.g. relating to research activities and/or live releases in the fishery)? Furthermore, is the seabird bycatch information for 2017-2019 available for sharing? This item was mentioned as part of the *corrective action plan* provided to review the most current bycatch rates for common loon (which were said to show lower rates than previous estimates), and other seabirds. **19.** Any new studies or report on Endangered, Threatened and Protected (ETP) species interactions as it relates to the fisheries under assessment? **20.** Recent known interactions between the fisheries under assessment and the following: basking sharks and leafscale gulper sharks? **21.** Can the assessment team be provided with total catch in numbers of Grey skate (*Dipturus flossada / batis*) for the latest available MFRI survey? Any additional updates on the state of this endangered species / complex? **22.** What survey abundance or status updates can be provided regarding vulnerable/ETP species: 1) Atlantic halibut, 2) dogfish, 3) Greenland shark and 4) porbeagle shark? **23.** Have there been any recent interactions with Blue whales and Northern right whales for the fisheries under assessment? **24.** 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

Date	Organization and Location	Representative	Main Topics of Discussion
			what extent are such bycatch reduction devices / practices used in these fisheries? **25.** Harbour porpoise updates, status and management? The 2019 NAMMCO SC report[5] indicated that modelling work related to assessment of potential effects of by-catch on harbour porpoises (and coastal seals) around Iceland is being undertaken by an international expert group in relation to implementation of the US Marine Mammal Protection Act import provisions. Updates on this work? **26.** 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 the most recent 2-3 years in table/figure format? **27.** A smartphone app has been in development for some time by the Directorate of Fisheries to facilitate recording of marine mammal and seabirds' bycatch in smaller vessels? Updates? **28.** Any updated MFRI reports on the by-catch of seabirds and marine mammals in Icelandic fisheries (not relating to lumpfish)? **29.** Coral areas. Any updates or new closures in the past 12-18 months? **30.** Bycatch of sponges are recorded during bi-annual groundfish surveys allowing managers to estimate the distribution of mass sponge occurrences. Is there an index of past occurrence that can be provided to the assessment team? Any updates on management measures specific to conservation of sponge communities? **31.** Hydrothermal vents. Any updates or new closures in the past 12-18 months? **32.** 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 (see http://norden.diva-portal.org/smash/get/diva2:1304079/FULLTEXT02.pdf), have there been additional activities or plans to reflect and address the findings of the report? **33.** Any new studies, papers or reports on Icelandic marine ecosystem's structure or foodweb dynamics?
Wednesday 13th January 2021, 10.00 am	Directorate of Fisheries / Fiskistofa Video call	Fisheries Directorate Þorsteinn Hilmarsson, Head of Services and information Sævar Guðmundsson Department Manager GT Assessment Team: Vito Romito Dankert Skagen	**1.** Brief review or key highlights of the 2019/2020 fishing season for cod, haddock, saithe, golden redfish, ling, tusk and ISS herring. Any key issues or updates from a Fiskistofa perspective? **2.** Any significant changes in the management system, key laws or regulations in the past 12-18 months? **3.** Any changes or updates of mention within Fiskistofa in the past 12-18 months? **4.** Any changes or updates in technical measures and effort controls or controls for the demersal and pelagic fisheries under assessment (e.g. powers to spatially / temporally limit gear types and fishing areas, prevent fishing in areas with high catches of undersized fish, minimum legal sizes etc)? **5.** Any new or updated closed areas within the Icelandic EEZ in the past 12-18 months? **6.** Any changes to the Fiskistofa website or the way information, data and reports are presented online?

[5] https://nammco.no/wp-content/uploads/2017/01/final-report_sc26-2019_rev230120.pdf

Date	Organization and Location	Representative	Main Topics of Discussion
			7. Is there an update / substitute document for fishing regulations booklet http://vefbirting.oddi.is/raduneyti/fiskveidar2018 ? **8.** 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 / pelagic trawlers, longliners, gillnetters, purse seiners? **9.** Monitoring of less valued species including elasmobranchs – is this something you had planned for 2020?` **15.** Weighing. 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 shortcoming identified in the report, has there been progress and updates to deal with this issue in the past 18 months? **16.** 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 2019 and 2020? Are there examples of this? **17.** Overfishing of quotas/deviation from TAC: Over the years, we have got a fair understanding of how that is possible within the legal framework, but a fresh overview of the various transfers would be useful. That also includes catches outside the ordinary ITQ system. **18.** Corrective Action relating to Non-Conformance 1 (applicable to all certified fisheries): *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? Has the compliance of fishermen recording of such interactions in logbooks changed in the past 12-24 months? A smartphone app has been in development for some time by the Directorate of Fisheries to facilitate recording of marine mammal and seabirds' bycatch in smaller vessels? Has the app been rolled out? **19.** Corrective Action relating to Non-Conformance 2: *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.* Regarding Spotted wolffish: How can the quotas be overfished so much within the legal constraints? Is this an example of quota transfers hitting vulnerable stocks or are other mechanisms more important? Any plans for amending rules that allow overfishing? How far is it technically possible to avoid bycatches of spotted wolffish, in particular in the long line fishery? **20.** 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? **21.** Collaboration between the Coast Guard and Fiskistofa relating to fisheries monitoring and enforcement activities. Updates for the past 12-18 months? **22.** 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

Date	Organization and Location	Representative	Main Topics of Discussion
			fisheries? Updates? **23.** 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?

5 Conformity statement

The assessment team recommends that the management system of the applicant fishery, the Icelandic summer spawning (ISS) herring commercial fishery under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls, and indirectly by gears from other Icelandic fisheries legally landing herring within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), is granted continued certification.

6 Conformance Criteria Fundamental Clauses for Surveillance Reporting

7.1. Section 1: Fishery Management

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

Supporting Clauses:	1.1.1, 1.1.2, 1.1.3, 1.1.4, **1.1.5, 1.1.6**, 1.1.7, 1.1.8 and sub-clauses, 1.1.9 and sub-clauses, 1.1.10 and sub-clauses			
Important Note:	Clause 1.1.5 and Clause 1.1.6 are new to IRFM Standard v2.0 and are scored separately in Appendix 2. Text added to 1.1.10.5 in IRFM Standard v2.0: ***"…and relevant authorities."*** Clause 1.1.10.5 (minor change) – wording change only no change to intent of Clause.			
Clause Guidance:	***There shall be a structured and effective fisheries management system, with objectives including the limiting of total annual catches for the stock under consideration. Accordingly, appropriate management measures for the conservation and management of the stock shall be adopted and effectively implemented by the competent authorities. Fishing for the "stock under consideration "shall be managed by the competent authorities in accordance with a documented and publicly available Fisheries Management Plan.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Iceland has a well-established marine policy, specified in legislation, on the structure of fisheries management and in practical implementation. The Ministry of Industries and Innovation is the principal management organization responsible for Icelandic fisheries. The Directorate of Fisheries is responsible for the implementation of Fishery Regulations on behalf of the Ministry. The Icelandic Coast Guard 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 Marine and Freshwater Research Institute conducts a wide range of marine research and provides the Ministry with scientific advice. The ISS herring stock is managed according to a management plan, approved by ICES, that has been in place since 2017. The main management measures include TACs in an ITQ system, area closures to protect undersized and spawning fish, a discard ban and mesh size regulations. There is a specific law for the herring fishery.

EVIDENCE

Iceland has an established Marine Policy and a structured management system[6] covering all commercial species, including herring[7]. There is a principal Act *(last amendment No 116/2006)*[8] and a number of supporting Acts and Regulations for the management of the fishery.[9] 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*

6 http://www.fiskistofa.is/english/fisheries-management/
7 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/
8 https://www.althingi.is/lagas/nuna/2006116.html
9 https://vefbirting.prentmetoddi.is/raduneyti/stjorn_fiskveida_2020-21/66/

Iceland. Policies incorporate a number of International Agreements and declarations[10], including; UN Convention of the Law of the Sea, Agenda 21 of the Rio Declaration, FAO Code of Conduct for Responsible Fisheries and the International Plan of Action to prevent, deter and eliminate Illegal, Unregulated and Unreported Fishing.

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 Innovation[11] 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 (Althingi), and according to advice from the Marine and Freshwater Research Institute (MFRI). The ministry now (after 2012) covers all sectors of ordinary business and economic activity. Two ministers share the responsibilities, one for fisheries and agriculture and one for tourism, industry and innovation. Overall responsibilities in the fisheries sector include:

- Fisheries Management
- Research, conservation and utilization of fish stocks, other living marine resources of the ocean and the seabed and management of areas where these resources can be harvested
- Research and control of production and import of fisheries products
- Mariculture of marine species
- Supporting the research, development and innovation in the fisheries sector

The executive body is the **Fisheries Directorate (Fiskistofa)**[12], which is responsible for the implementation of Fishery Regulations on behalf of the Ministry. A large part of the at sea surveillance falls directly under the responsibility of the Icelandic Coast Guard. Key functions of the Directorate of Fisheries include:

1 Implementation of regulations
2 Collection and collation of fishery catch data
3 Supporting research, survey work
4 Supporting Coastguard and surveillance activities
5 Managing and policing the Icelandic ITQ system

The Icelandic Coast Guard[13] 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.

The **Marine and Freshwater Research Institute (MFRI)[14]** conducts a wide range of marine research and now provides the Ministry with scientific advice as Marine Research Institute (MRI) did previously. MFRI was established on July 1, 2016 as a result of a merger of two inveterate Icelandic research institutes, the Institute of Freshwater Fisheries (founded in 1946), and the MRI (founded in 1965).[15] MFRI has wide international cooperation in all major fields of marine science, as indicated by its publication record[16].

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 overall TAC is distributed on vessels

10 https://www.government.is/topics/business-and-industry/fisheries-in-iceland/international-policy/
11 http://eng.atvinnuvegaraduneyti.is/
12 http://www.fiskistofa.is/english
13 http://www.lhg.is/english
14 https://www.hafogvatn.is
15 http://www.althingi.is/lagas/nuna/2015112.html
16 https://www.hafogvatn.is/is/midlun/utgafa/ritaskra

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)[17]. The main elements are:

- Each vessel is assigned a quota share (%) in each stock, initially based primarily on catch history over a reference period.
- 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, and in some cases between species. Quota transfer is mainly intended to promote rationalisation and thus increase profitability in the industry.
- 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

A coastal fishery is permitted under quotas aside from the ITQ system: Coastal fishing allocations are[18] not based on vessels' quota share; have a limited amount and have a series of applicable provisions[19]. These are designed to support local communities. 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[20].

Supportive measures in general include area closures (temporary and permanent) and gear restrictions. There is extensive control and monitoring of landings. Discards are prohibited, as discussed in Section 1.2. The fishery of the summer-spawning herring is specifically regulated by regulations set by the Icelandic Ministry [21]. 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 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), according to standards approved by ICES in regular benchmark assessments. ICES provides advice, which is normally 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, Iceland skipped participation in NWWG and the ICES advisory process for all Icelandic stocks[22], including herring[23], and relied on assessments performed by the MFRI . The advice on herring was made by MFRI according to the management plan, following ICES standards.

There is a management plan in place for most commercial stocks, including herring. The general objective is 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*

17 https://www.althingi.is/lagas/nuna/2006116.html
18 http://www.fiskistofa.is/veidar/aflaheimildir/byggdakvoti/
19 http://www.fiskistofa.is/fiskveidistjorn/umfiskveidistjornunarkerfid/strandveidar/
20 https://www.sciencedirect.com/science/article/pii/S0308597X16302238
21 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662
22 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/NWWG/03%20NWWG%202020%20Report%20-%20Sec%2001%20Introduction.pdf
23 https://www.hafogvatn.is/static/extras/images/30-herring-11206946.pdf

yield (MSY) in the long term.[24] When harvest rules have been established, as for herring, the Ministry recognizes an obligation to set the TAC accordingly. The management plan for herring was introduced in 2017, after being examined and approved by ICES in 2017[25,] . The plan is publicly available [26]. Previously, the management target has been $F_{0.1}$ for more than 20 years. The present target is a harvest rate of 15%, which corresponds to a slightly lower fishing mortality.

24 https://www.government.is/topics/business-and-industry/fisheries-in-iceland/
25 http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/iceland.2017.11.pdf
26 https://www.government.is/topics/business-and-industry/fisheries-in-iceland/

Clause 1.2 – Research and Assessment

Supporting Clauses:	1.2.1, 1.2.2, 1.2.3, 1.2.4 and sub-clauses, 1.2.5, 1.2.6, 1.2.7			
Important Note:	Clause 1.2.1: Text added (**Bold**) in IRFM Standard v2.0: "*A competent research institute or arrangement shall collect and/or compile the necessary data and carry out scientific research and assessment of the state of fish stocks and the condition of the ecosystem.* ***Research results shall be made public in a timely and readily understood fashion."*** Minor change – Dissemination of research results addressed specifically below.			
Clause Guidance:	***The relevant data collected/compiled by the relevant authorities shall be appropriate to the chosen method of stock assessment and sufficient for its execution, in line with assessing the size and/or productivity of the fish stock(s) under consideration. The determination of suitable conservation and management measures shall include or take account of total fishing mortality from all sources (including discards, incidental mortality and catches in other fisheries). Furthermore, there shall be active collaboration with international scientific organizations for stock assessment activities and review, and, in cases where the stock under consideration is a shared stock or a straddling stock or a highly migratory stock, there shall be scientific cooperation at the relevant bilateral, regional or international level for obtaining data and/or conducting stock assessments and/or providing advice, as appropriate.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

There is an established assessment method for Icelandic herring, that has been used since it was approved following a benchmark assessment by ICES in 2011. The model operates on the commercial catches disaggregated by age, and an acoustic survey, and accounts for additional mortality caused by a fungal pathogen (*Ichthyophonus hoferi*). Discards are prohibited and assumed to be small. Herring from other herring stocks are landed and handled separately. Catch numbers at age are obtained by combining landings statistics with samples from the landings, obtained through an organized sampling regime. Normally, the assessment of the stock is done by the ICES North Western Working Group (NWWG) where all relevant nations are represented. ICES reviews the NWWG report and provides advice based on the report. This year, the assessment was done locally by the MFRI, but following standards approved by ICES. TACs are set according to scientific advice from ICES and MFRI. Summer spawning herring is regarded as a domestic Icelandic stock.

EVIDENCE

Catch data

The location of the fishery has varied over the years[27]. For a number of years, the main fishing grounds were in Breiðafjörður, and the fishery was by purse seine as trawl is prohibited in inshore waters. The last years, the fishery has moved to the Western shelf edge, and the catches are by pelagic trawl (Figures 1 and 2).

Catches in number at age are from catch data that at present are collected at sea by fishermen, according to regulations[28]. The calculation is done in strata confined by season and area and with two different age-

27 http://www.ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2019/her.27.5a_SA.pdf
28 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662

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.

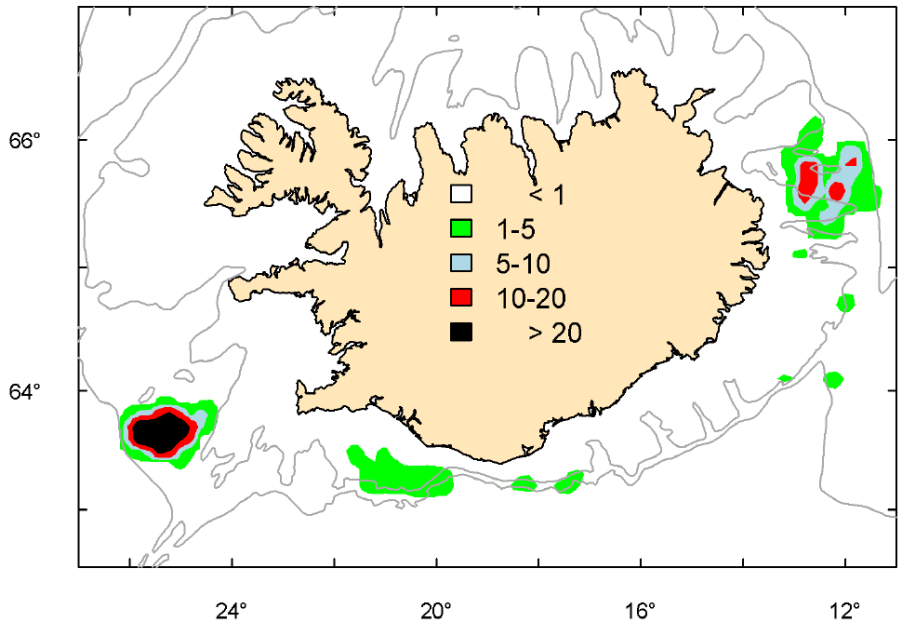

Figure 1. The distribution of the fishery (in tonnes) of Icelandic summer-spawning herring during the fishing season 2019/20, including the bycatch in the mackerel and Norwegian spring-spawning herring fishery in July-September 2019.

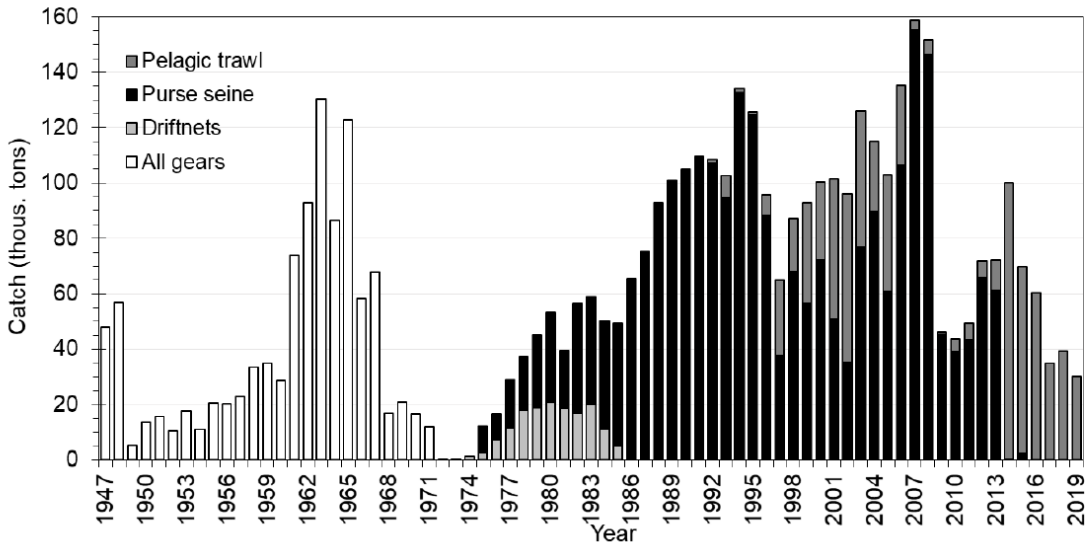

Figure 2. Icelandic summer-spawning herring. Seasonal total landings (in thousand tonnes) during 1947-2019, referring to autumns, by different fishing gears from 1975 onwards.

Survey data

The herring stock is measured in an acoustic survey. The survey area and timing is adaptive, according to the distribution of the herring. In 2019-2020 it was measured in two areas, West of Iceland in Kolluáll in the end of March (B3 in Figure 3) and , and south-east of Iceland in Breiðamerkurdjúp in Oct./Nov (B12). There is also a coverage of juveniles in the Western fjords (B11). The latter is not used directly in the assessment, but is useful as a measure of recruitment.

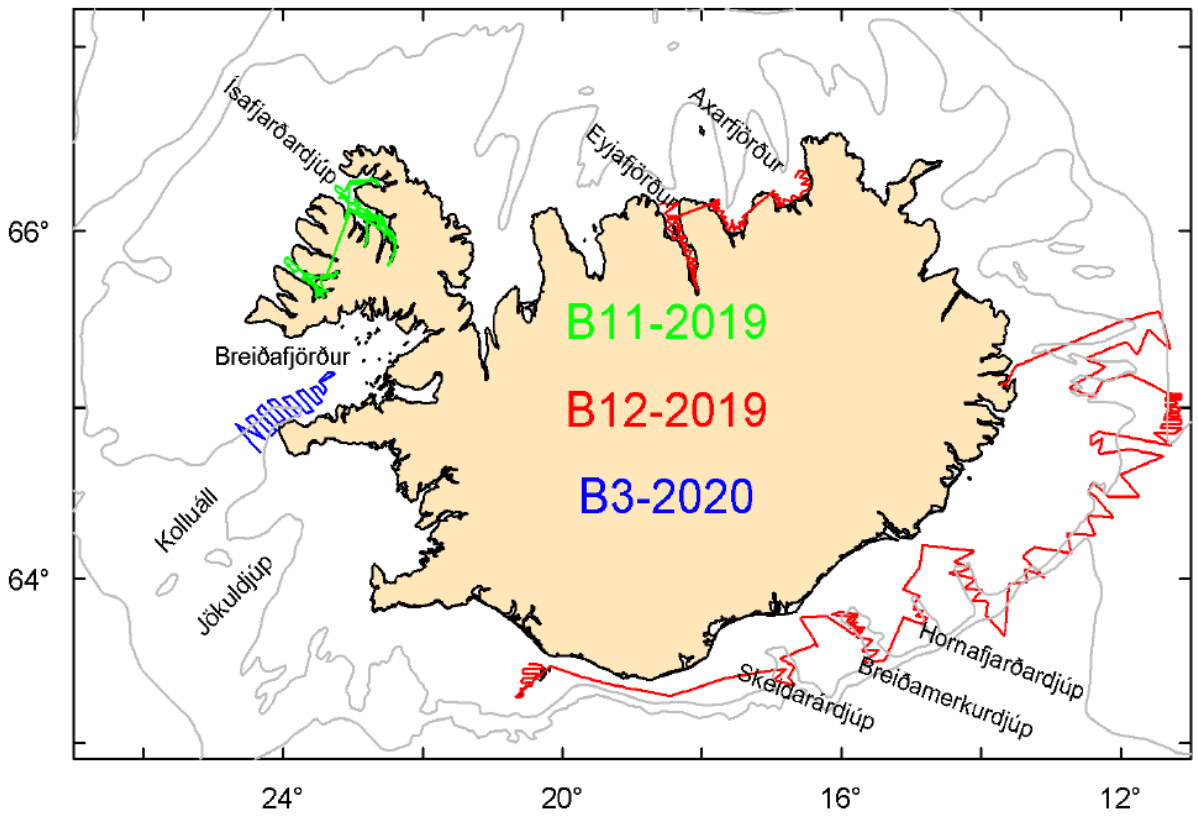

Figure 3. The survey tracks in the acoustic measurements of Icelandic summer-spawning herring in the north, east and south (B12-2019; juveniles and adults; red), in the west (B3-2020; adult; blue), and in the fjords north-west (B11-2019; juveniles; green).

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 2011[29] 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. The model operates on the commercial catches disaggregated by age, and an acoustic survey, and accounts for additional mortality caused by the pathogen *Ichthyophonus hoferi*.

In 2020, due to the Covid-19 epidemic, Iceland did not participate in the NWWG[30], but performed the assessment and provided advice on its own. The procedures approved by ICES were followed, so the assessment was an update of previous assessments.

Both recruitment and SSB have declined over the last 15 years, while the fishing mortality has fluctuated FMSY (Figure 4 and 5).

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

30 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/NWWG/03%20NWWG%202020%20Report%20-%20Sec%2001%20Introduction.pdf

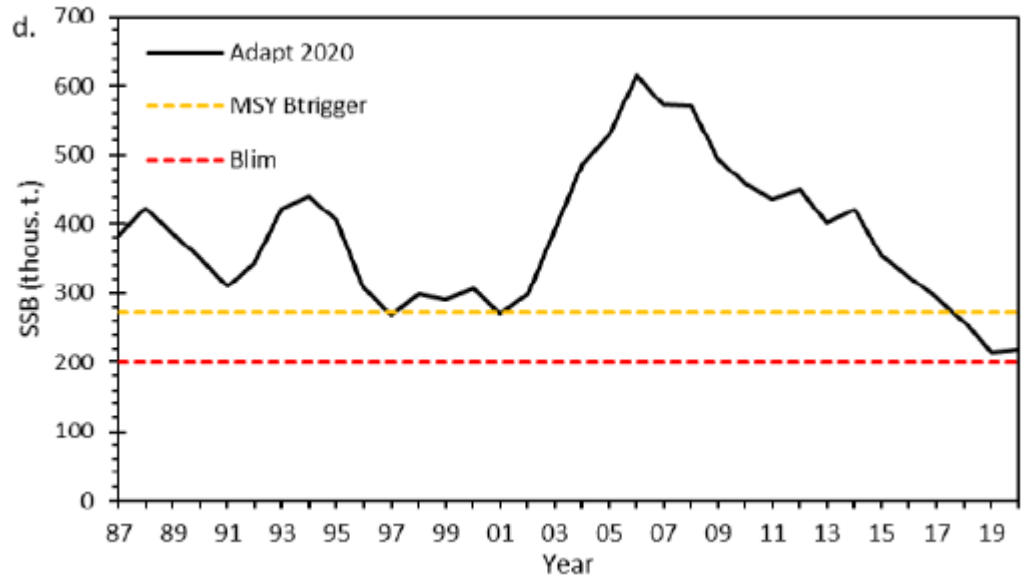

Figure 4. Estimates of SSB.

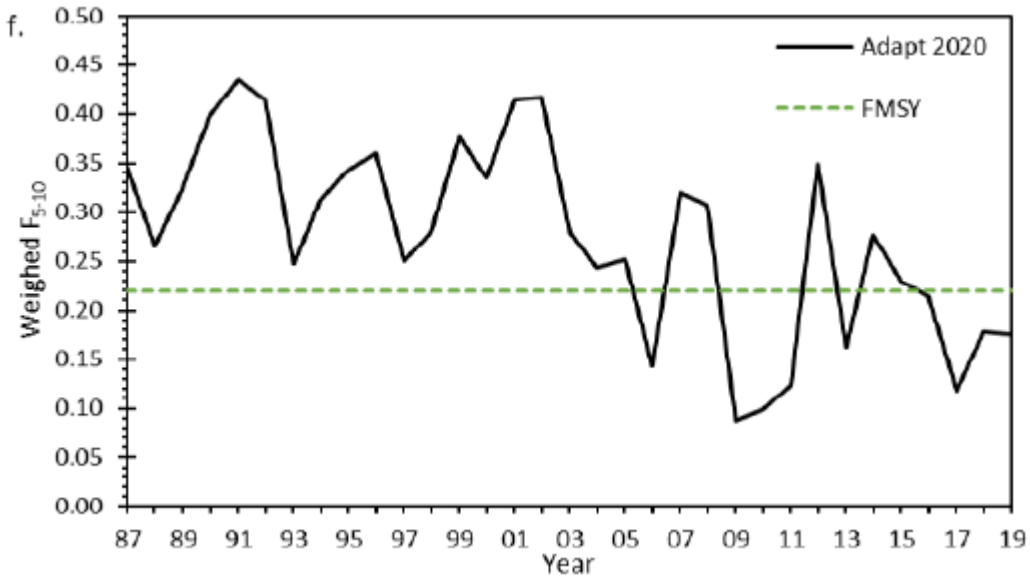

Figure 5. Estimates of fishing mortality.

Retrospective analyses indicate a consistency over the most recent six years, i.e. adding new data to the model does not change the present perception of the stock size much (Figure 6).

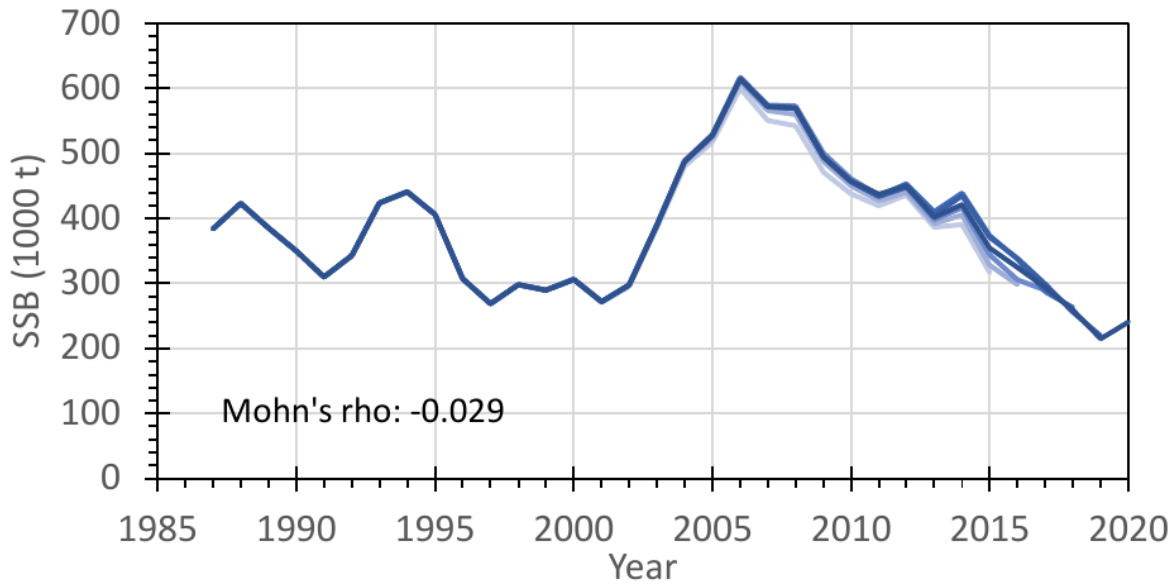

Figure 6. Retrospective pattern from NFT-Adapt in 2020 in spawning stock biomass.

There has been an outbreak of *Ichthyophonus* infection in the herring stock since 2008.[31] The cause is not clear, but it has been suggested that the occurrence of *Ichthyophonus* spores could be linked to the observed increased temperature off the south-west coast. Further research on the causes and origins of such an outbreak are ongoing at MFRI as an MSc student project. Preliminary results indicate that the source of the infection is widespread and is in various zooplankton groups and species. Recent analyses show that significant additional mortality took place only over the first three years. A new infection since the summer 2016 is expected to cause significant mortality again. For how long this outbreak will last is unknown.[32] The assessment estimates the added mortality and its impact on the stock abundance.

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 and the ICES advisory process for all Icelandic stocks[33], and relied on assessments performed by the MFRI[34]. The advice was made by MFRI following ICES standards, as approved in the benchmark-process at the most recent evaluation in ICES in 2011[35]. The harvest rule in the current management plan was evaluated and approved by ICES in 2017[36].

Iceland has broad international scientific cooperation through organisations such as the Northeast Atlantic Fisheries Commission (NEAFC)[37], the Northwest Atlantic Fisheries Organization (NAFO)[38], and the North

31 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. dx.doi.org/10.1139/cjfas-2017-0219.

32 https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf (Section 11)

33 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/NWWG/03%20NWWG%202020%20Report%20-%20Sec%2001%20Introduction.pdf

34 https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf

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

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

37 http://www.neafc.org/

38 http://www.nafo.int/

Atlantic Marine Mammal Commission (NAMMCO)[39]. 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.

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 website[40]. 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 website[41]. 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.

As noted above, the assessment and advice were made by MFRI alone this year, due to travel restrictions under the Covid 19 epidemic. No further changes were made to the standard procedures, including publishing the assessment and advice on MFRI's website.

39 http://www.nammco.no/
40 http://www.ices.dk
41 https://www.hafogvatn.is/is/veidiradgjof

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

Clause 1.3.1 – The Precautionary Approach

Supporting Clauses:	1.3.1.1, 1.3.1.2, 1.3.1.3, 1.3.1.4, 1.3.1.5, 1.3.1.6			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***The precautionary approach shall be implemented, as specified in the Fisheries Management Plan, to effectively protect the stock under consideration. Accordingly, relevant uncertainties shall be taken into account through a suitable method of risk assessment, appropriate reference points shall be determined, and specified remedial actions shall be taken if reference points are approached or exceeded.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

A target reference point for the harvest rate (Catch/Biomass aged 4 and older) as a proxy for fishing mortality is defined as part of a harvest control rule. The harvest control rule also has a trigger biomass below which the harvest rate is reduced. The harvest control rule is considered precautionary and is expected to give near maximum long term yield. With the current rule and historical recruitment dynamics, the probability of reaching the limit biomass should be low. If needed, there is the legal framework and a suite of control measures available to management to take further action.

EVIDENCE

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.[42] This is achieved by applying a harvest control rule (HCR) that has been evaluated by ICES and found to be consistent with the precautionary approach and to conform to the ICES MSY approach. 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.

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:

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

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:

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

ICES has defined precautionary reference points for Icelandic summer spawning herring, as well as reference points related to MSY (Table 5). The list was revised and extended by ICES in 2016, and is still recognized by Icelandic authorities[43]. Blim was an approximate breakpoint in the stock-recruit relation, originally from 2003 but verified in 2016 by ICES. Other PA reference points were derived (in 2016) from Blim in accordance with the ICES Technical Guidelines, assuming an assessment uncertainty with σ = 0.18

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

43 https://www.hafogvatn.is/static/extras/images/30-herring-11206946.pdf

Table 5. Icelandic summer spawning herring. Present reference points, values and their technical basis .

Nálgun *Framework*	Gátmörk *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	$B_{lim} * e^{1.645\sigma}$, 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}	0.43	$F_{pa} = F_{lim} \times \exp(-1{,}645 \times \sigma)$, σ = 0.18

The HCR is designed to carry a low risk (<5%) of bringing the stock down to the limit. Even when assessment bias is assumed, the lower 5-percentile for SSB with the adopted target harvest rate = 0.15 is about 300,000 t. In the evaluation of the harvest rule[44], the stock-recruit function was estimated from the long-term history as a hockey stick function (Figure 7) with log-normal variation and autocorrelation included. The risks were evaluated assuming that the recruitment behaves as in the past. The recent recruitments have declined over a long period and are now lower than indicated by the model. In the calculations, the assumption was that this trend would be broken in 2018 . The estimate of the last recruitment is higher, but the estimate of the most recent recruitment is often uncertain. If the recruitment and stock continue to decline, the risks for the future may be larger than estimated. At present, the management plan prescribes a reduced harvest rate if SSB is below Blim = 200 000 tonnes, but does not have an explicit revision clause to cover situations where the assumptions underlying the evaluation is violated.

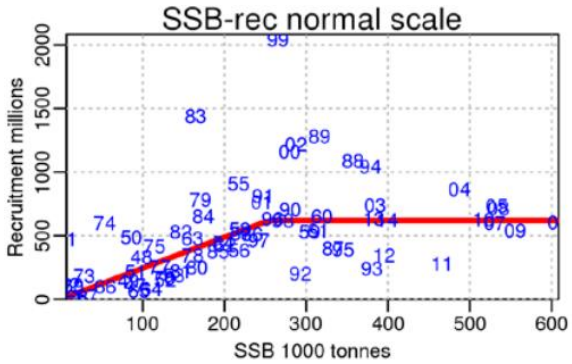

Figure 7. The hockey stick stock recruit function and the history of stock recruit data.

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

Clause 1.3.2 – Management targets and limits

Clause 1.3.2.1 – Harvesting rate and fishing mortality

Supporting Clauses:	1.3.2.1.1, 1.3.2.1.2			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***The management target for fishing mortality (or its proxy) and the associated limit reference point, as well as the management action to be taken when the limit reference point is exceeded, shall be stated in the Fisheries Management Plan. If fishing mortality (or its proxy) is above the limit reference point, management actions shall be taken to decrease the fishing mortality (or its proxy) below the limit reference point.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The management plan states a target harvest rate which is a proxy for a fishing mortality. A limit harvest rate is not included in the management plan. It is considered redundant as the existing rules, together with strong mechanisms for implementation and enforcement, are regarded as sufficient to protect against overfishing.

EVIDENCE

The management plan states a target harvest rate (15% of biomass 4 years and older), which is a proxy for a fishing mortality. There are no specific limit harvest rate defined, but the fishing mortality corresponding to the target harvest rate, which is in the order of 0.2, is far below the precautionary limits (Flim = 0.61 and Fpa = 0.43). Together with strong mechanisms for implementation and enforcement, this is regarded as sufficient to protect against overfishing.

Clause 1.3.2.2 – Stock biomass

Supporting Clauses:	1.3.2.2.1, 1.3.2.2.2, 1.3.2.2.3, 1.3.2.2.4			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***The long term management target for stock size (biomass), either explicit or implicit depending on management approach, and limit reference points consistent with the objective of promoting optimum utilization, shall be specified. Furthermore, limits or directions for stock size (or its proxy), consistent with avoiding recruitment overfishing shall be specified and should the estimated stock size approach B_{lim} (or its proxy), then appropriate management action shall be taken with the objective of restoring stock size to levels above B_{lim} (or its proxy) with high probability within a reasonable time frame.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

A target biomass has not been defined, as the primary management tool is a harvest rate, which should lead to near maximum catches in the long term. The SSB is now approaching Blim, which is the trigger in the rule. At present, there is no explicit revision clause.

EVIDENCE

There is no explicit management target for the stock biomass, as the management target is defined in terms of a mortality measure. The harvest rule has a trigger SSB equal to the precautionary limit biomass (200 000 tonnes SSB), below which the harvest rate shall be reduced in proportion to SSB/Btrigger. To what extent that will lead to rapid recovery depends on the cause of the decline. In the simulations, this has not been extensively tested as it appeared as an unlikely event. The SSB is now approaching Blim, which is the trigger in the rule. At present, there is no explicit revision clause.

Clause 1.3.2.3 – Stock biology and life-cycle (Structure and resilience)

Supporting Clauses:	1.3.2.3.1, 1.3.2.3.2, 1.3.2.3.3			
Important Note:	Old Clause 1.3.2.3.3 removed from Standard in IRFM Standard v2.0.			
Clause Guidance:	***Information on the biology, life-cycle and structure of the stock shall be taken into account and consideration shall be given to measures designed to avoid excessive exploitation of spawning components at spawning time, as appropriate, especially at times when biomass (SSB) may approach the level of the limit reference point (B_{lim}). Relevant gear selectivity properties for the protection of juvenile fish shall be specified, as appropriate. Consideration shall also be given to measures designed to limit fishing mortality of juvenile fish, e.g. through temporary closures to fishing of areas containing a high proportion of juveniles of stock under consideration, with the objective of reducing the likelihood of growth overfishing and increasing the contribution of year classes to the spawning stock.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The fishery is primarily for adult herring, and is presently concentrated well away from the nursery areas, which are mostly in the fjords in the North. There has been a minimum landing size in previous regulations, but not in the most recent revision.

EVIDENCE

Rules for the performance of the fishery for Icelandic herring are given in a specific regulation[45]. The rules have varied over the years, but at present, the fishing season is from the 1st of September to the 30th of April the next year, by which the spawning season is avoided. There is a minimum mesh size in gillnet fisheries for herring of 63 mm, but no mesh size regulations for pelagic trawls or nets. The fishery is primarily for adult herring, and is presently concentrated well away from the nursery areas, which are mostly in the fjords in the North. There has been a minimum landing size in previous regulations, but not in the most recent revision.

45 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662

Clause 1.4 – External Scientific Review

Supporting Clauses:	1.4.1, 1.4.2			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***For the stock under consideration the harvesting policy (including its consistency with the precautionary approach), stock assessments and advice shall be reviewed, by request from the fisheries management authorities at appropriate, regular intervals as well as when substantive changes are made in harvesting policy by an appropriate international scientific body or committee. Following external scientific review, the competent fisheries management authority shall review and/or revise the harvesting policy, taking into consideration the external review, as appropriate.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

ICES is regarded as the relevant scientific body. The assessment method for herring was evaluated and approved in 2011. The management plan was evaluated in 2017. The approved procedures have been followed since then.

EVIDENCE

ICES is regarded as the relevant scientific body. 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 method for herring was evaluated and approved in 2011. The management plan was evaluated in 2017. The approved procedures have been followed since then. No re-evaluations have been planned so far, but both the assessment and the harvest rule are considered too work satisfactorily.

As discussed in Clause 1.2, the assessment in 2020 was done by MFRI, but following the ICES protocol.

Clause 1.5 – Advice and Decisions on TAC

Supporting Clauses:	1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.7, 1.5.8, 1.5.9, 1.5.10			
Important Note:	Clause 1.5.1: Text added (**Bold**) in IRFM Standard v2.0: "*A competent scientific body, research institute, designated advisory body or arrangement shall provide the competent fisheries management authority with fisheries advice on the harvesting of the stock under consideration, **in a timely manner**.*" Minor change – Timeliness of fisheries advice addressed specifically below. Clause 1.5.9: Minor change to wording and text added (**Bold**). IRFM Standard v1.1: *Management agreements reached in the competent Regional Fisheries Management Organization(s) or arrangements, relevant to the stock under consideration, shall be implemented by states and effectively and uniformly executed.* IRFM Standard v2.0: *The competent fisheries management authorities **shall cooperate and actively participate** in competent Regional Fisheries Management Organisation(s) (RFMOs) or arrangement(s), relevant to the stock under consideration and management agreements reached shall be implemented by fisheries authority and effectively and uniformly executed.* Minor change – Management authorities' cooperation and participation in RFMOs or arrangements addressed specifically below.			
Clause Guidance:	***Appropriate scientific advice shall be provided to the competent fisheries management authority including on the appropriate value(s) for precautionary reference points. For shared stocks the setting of TAC shall take into consideration international agreements and scientific advice. Decisions on TAC shall be made and implemented in such a way as to ensure that the actual catch is as close to the intended catch as practically possible.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

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 the advice by MFRI. The MFRI advice is based on work and advice by ICES. On average, catches have been close to the TACs.

EVIDENCE

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 taken over by local authorities and published once it is ready on the MFRI website. The advice includes the reference points as shown in Clause 1.3.1. The Icelandic herring stock is a local stock confined to Icelandic waters, and is managed by Iceland alone. 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 the HCR and the advice mentioned above. For the last decade, both before and after the introduction of the HCR in 2017, the scientific advice has been according to the rule and quotas have been set according to the scientific advice with minor exceptions (Table 6 and Figure 8). The actual catch can deviate from the TAC, up to about 15% in both directions, A likely cause is the year-to-year flexibility that is permitted, as further discussed in Section 2. Over time, this levels out – the sums of catch and TAC over 10 years is almost equal.

Table 6. Recommended TAC, national TAC, and catches (tonnes). Catches represents sum of the winter catches and the summer catches in the preceding fishing year.

Fiskveiðiár *Fishing year*	Tillaga *Rec. TAC*	Aflamark *National TAC*	Afli *Catches*
2010/11	40 000	40 000	43 533
2011/12	40 000	45 000	49 446
2012/13	67 000	68 500	71 976
2013/14	87 000	87 000	72 058
2014/15	83 000	83 200	94 975
2015/16	71 000	71 000	69 729
2016/17	63 000	63 000	60 403
2017/18	38 712[1)]	39 000	35 034
2018/19	35 186[1)]	35 186	40 683
2019/20	34 572[1)]	34 572	30 038
2020/21	35 490[1)]		

[1)] 15% aflaregla. *15% harvest control rule.*

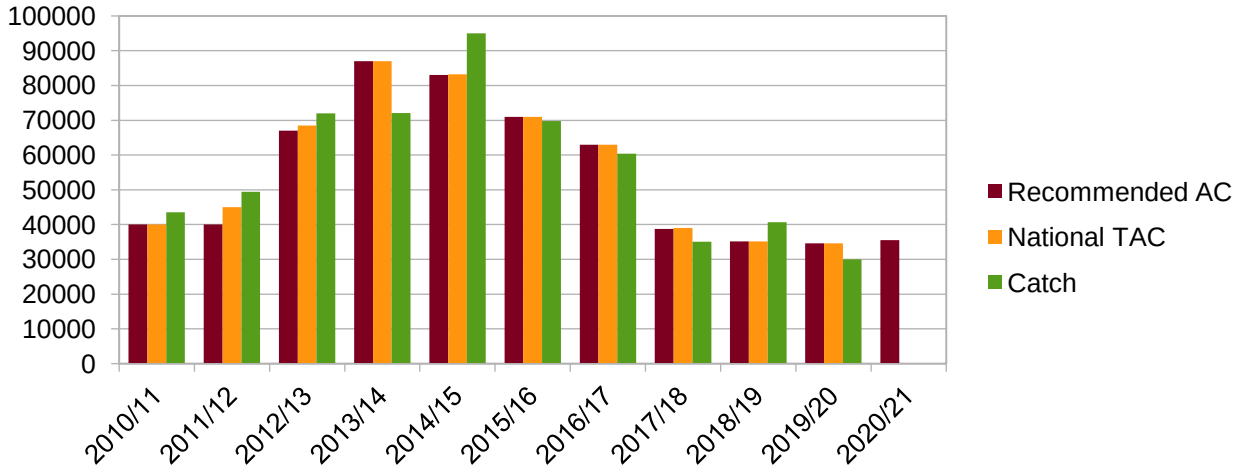

Figure 8. Recommended TAC, National TAC and Actual catch.

7.2. Section 2: Compliance and Monitoring

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

Supporting Clauses:	2.1.1, 2.1.2			
Important Note:	Clause 2.1.2 is new to IRFM Standard v2.0 and is scored separately in Appendix 2.			
Clause Guidance:	***An effective legal and administrative framework at the local, national or regional level, as appropriate, shall be established for the fishery, and compliance shall be ensured through effective mechanisms for monitoring, surveillance, control and enforcement.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

An effective legal and administrative framework exists which is implemented by the Fisheries Directorate, part of the Ministry of Industries and Innovation. The Directorate works closely with the Coast Guard and Port Authorities. Key legislation underpinning the framework comprises the Fisheries Management Act (No. 116/2006), the Act on Fishing in Iceland's Exclusive Economic Zone (no. 79/1997) and the Act concerning the Treatment of Commercial Marine Fish Stocks (no. 57/1996).

Acts and regulations concerning conservation and management measures are publicly available and effectively disseminated through a number of government websites including via an annual law gazette.

EVIDENCE

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)[46], the Fisheries Management Act (no. 116/2006), 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 catches[47]. 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 website[48] (see also the digital booklet for the 2020-2021 regulations at https://vefbirting.prentmetoddi.is/raduneyti/stjorn_fiskveida_2020-21/94/).

The primary legislative instrument relating to fisheries management in Iceland and the basis for the ITQ system is the Fisheries Management Act No.116/2006[49]. The fishery of the summer-spawning herring is

[46] https://www.althingi.is/lagas/149a/1992036.html
[47] http://www.fiskistofa.is/english/about-the-directorate/
[48] https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2020/09/01/Stjorn-fiskveida-2020-2021-Log-og-reglugerdir/
[49] https://www.ecolex.org/details/legislation/fisheries-management-act-1990-lex-faoc003455/

specifically regulated by regulations set by the Icelandic Ministry[50]. According to this regulation, the fishery of the Icelandic summer-spawning herring is limited to the period 1 September to 1 May each season. Several other regulations are enforced by the Ministry that affect the herring fishery. They involve protections of juvenile herring (27 cm and smaller) in the fishery where area closures are enforced if the proportion of juveniles exceeds 25% in number (no. 376, 8 October 1992). No such closures took place in the 2019/2020 fishing season. Another regulation deals with the quantity of bycatch allowed. Then there is a regulation that prohibits use of pelagic trawls within the 12 nautical miles fishing zone (no. 770, 8 September 2006), which is enforced to limit bycatch of juveniles of other fish species[51].

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 1996[52]). Provisions of the Act on a Special Fee for Illegal Marine Catch[53] 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 in on beard and when not, to detect discards. Some findings have been published in 2019[54] and 2020[55].

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 Resources[56].

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 2020 smaller Icelandic vessels 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 298/2020[57]. The App also called Afladagbókina or catch diary[58] [59]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

50 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662
51 https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf
52 https://www.althingi.is/lagas/149a/1996057.html
53 https://www.althingi.is/lagas/149a/1992037.html
54 http://www.fiskistofa.is/umfiskistofu/frettir/aflasamsetning-a-botnvorpu-og-dragnotarveidum
55 http://www.fiskistofa.is/umfiskistofu/frettir/aflasamsetning-i-thorskanetum-og-botnvorpu
56 https://www.stjornartidindi.is/Advert.aspx?RecordID=884be309-64a5-4367-9e4d-f5e7216b6f40
57 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887
58 http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla
59 https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

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)[60] 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. As a result, two more cases were detected in 2020. The results of this surveillance are published online to show the violations and deter other potential violators[61].

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 990/2020[62] 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 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.[63].

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

[60] https://rikisendurskodun.is/wp-content/uploads/2019/01/Eftirlit-Fiskistofu-Stjornsysluuttekt.pdf
[61] http://www.fiskistofa.is/umfiskistofu/frettir/hlutfall-kaelimidils-mai-til-agust
[62] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/22140
[63] http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

disseminated through an online law gazette which provides the most up to date versions of the legislation (i.e. incorporates latest amendments)[64].

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.[65]

All scientific advice is available online[66]. Harvest control rules are scrutinised on request by an independent scientific body (ICES) with reports being published online[67] .

Up-to-date maps of fisheries closures are available on-line on the Fisheries Directorate website[68]. Temporary/sudden closures (general 2-3 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 January 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. Regulation regarding the short-term closures was changed in 2020, and the trigger limit was increased for cod and haddock (but not other species such as herring), which led to significant decrease in the number of closures. Short term closures for juvenile herring (27 cm and smaller) in the fishery are implemented if the proportion of juveniles exceeds 25% in number (no. 376, 8 October 1992). No such closures took place in the 2019/2020 fishing season[69]. An updated table as provided by the MFRI is shown below.

Table 7. Short term closures in Iceland for the years 2018-2020.

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

For 2020, two closures were triggered by bottom trawl gear, one by longline and 8 by handline gear.

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 in 2017-2018 (Source: Directorate of Fisheries, January 2021 remote audit).

Season	Fishery type: Bottom Trawl	Fishery type: Longline	Fishery type: Gillnet (include lumpfish and cod)	Other Gears (e.g. pelagic gears used to catch herring)?

[64] https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2019/09/13/Stjorn-fiskveida-2019-2020-Log-og-reglugerdir/
[65] http://www.fiskistofa.is/
[66] https://www.hafogvatn.is/static/extras/images/30-herring-11206946.pdf
[67] https://www.government.is/news/article/2018/05/15/Haddock/
[68] http://www.fiskistofa.is/fiskveidistjorn/veidibann/reglugerdarlokanir/
[69] https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf

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

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
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.

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 Report[70].

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
Framhjálöndun / 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

Error! Reference source not found. 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

[70] http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

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 retuned 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 Report[71].

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
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
framhjálöndun / 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 ólögmæts sjávarafla: / Imposition of a fee for illegal fishing	1323

[71] http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

Enforcement by the ICG

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 January 2021 the ICG reported that surveillance in 2020 was challenging due to the COVID 19 pandemic. These restrictions were lessened for a while during the summer, but for the majority of the year there were some kind of restrictions imposed. To meet the situation the ICG patrol vessels increased their visibility, using their boats to monitor the fisheries close to the fishing 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 (see Table 7) and none based on Fisheries inspections by ICG. The overall number of inspections since 1988 is shown below.

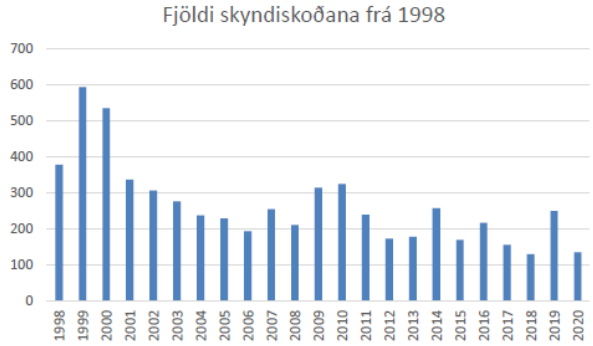

Figure 9. Overall number of ICG inspection from 1988 to 2020**.** Source: provided by the ICG during the remote audit, January 2021.

Also, we show here below a figure for the amount of air surveillance performed in 2020.

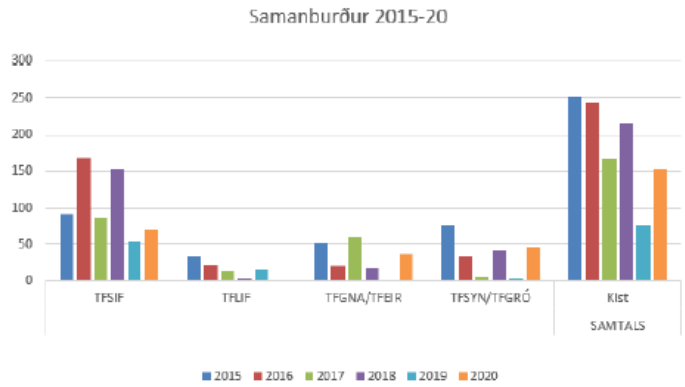

Figure 10. Air surveillance by four different Icelandic assets from 2015 to 2020. Samtals is the total. Source: provided by the ICG during the remote audit, January 2021.

Also, three foreign flag vessels were inspected the ICG in 2020, one longliner and one jigger vessels from the Faroese, and one Norwegian longliner, all within Icelandic EEZ. No capelin fisheries quota was issued within the IEEZ in 2020. As a result, no NOR, FRO or GRO flagged vessels were fishing for that stock and consequently
did not require inspection by the ICG. In terms of overall infringements, 15 reports of apparent infringements were reported in 2020, 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 2020, were: Lögskráningar /Crew registry, Réttindi /License, Veiðar /Fisheries, Veiðileyfi /Fishing permit, Vanmönnun /Manning, Farþegafjöldi /Passengers, Merkingar /Markings and Fjarskiptalög / Communications. These are shown below compared to historical data up to 2015.

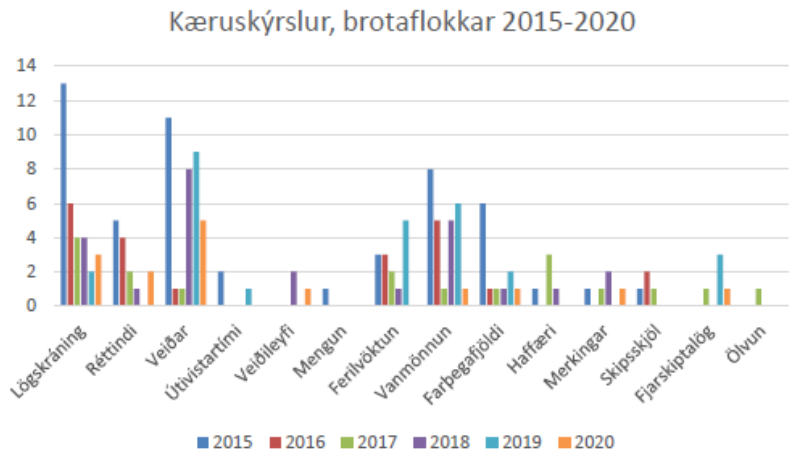

Figure 11. Overview of ICG infringement reports in 2015-2020. Source: provided by the ICG during the remote audit, January 2021.

Clause 2.2 – Concordance between actual Catch and allowable Catch

Supporting Clauses:	2.2.1, 2.2.2, 2.2.3, 2.2.4 and sub-clauses			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***Concordance between the Total Allowable Catch (TAC) and actual total catch from the stock under consideration shall be ensured through monitoring, control, enforcement, documentation and correction and verification activities. Accordingly, all participating companies engaged in fishing operations shall take responsibility and operate in compliance with the relevant rules and regulations.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Landings must be recorded in logbooks at sea and these are verified and standardised through physical weighing at accredited weigh stations in landings ports throughout Iceland. Registered weights for each landing are sent to the Fisheries Directorate, recorded on their catch registration database (GAFL), and the appropriate amount is subtracted from the vessels quota. ITQ transfers are also monitored to ensure that vessels either have or source sufficient quota to cover the entirety of their catch within 3 days of landing. Compliance is checked through at-sea and on-land monitoring by the Coast Guard and Fisheries Directorate inspectors with enforcement action taken where non-compliance occurs (detailed in clause 2.1.1).

EVIDENCE

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 compulsory as required by Regulation No.746/2016[72]. These must be electronic (e-logs) except for smaller vessels which are permitted to still use paper logbooks. 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.

The e-logs in use are developed and serviced by TrackWell, an Icelandic electronic systems service company; which also provide satellite Vessel Monitoring Systems (VMS) and electronic reporting systems. These systems generate mandatory reports to the Directorate, with data on catches and landings available

[72] https://www.stjornartidindi.is/Advert.aspx?RecordID=42a16a67-60a7-4ae7-ad7c-0f53fc254654

in near real-time providing a valuable management reporting system for fleet management. The vessel logbook system requires that the operator of a vessel reports information for each haul of the fishing gear to the Directorate including; haul number, date, time, latitude, longitude, catch by species, zone, water depth, seafloor, wind direction, wind speed, gear used, as well as other information. There are also other elements of the system which allow fishing companies to compile the data from their vessel(s) to facilitate better targeting of fishing activity in terms of area, species or size class of product dependent on the market demands at the time and also to ensure better traceability of product. Information is fed from a secure central server to a shared database that is accessible by both the Directorate (for management/ enforcement purposes) and the MFRI (for scientific purposes).

Logbooks are verified at sea by Fisheries Directorate inspectors and by the Coastguard and also on land by inspectors and through physical weighing at accredited weigh stations in landings ports.

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)[56].

The Minister of Fisheries and Agriculture decides on the TAC of the herring stock for each fishing year (Sept –May) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned below. For the last decade, both before and after the introduction of the HCR in 2017, the scientific advice has been according to the rule and quotas have been set according to the scientific advice with minor exceptions (Table 11 and Figure 12). The actual catch can deviate from the TAC, up to about 15% in both directions, A likely cause is the year-to-year flexibility that is permitted. Over time, this levels out – the sums of catch and TAC over 10 years is almost equal.

Table 11. Recommended TAC, national TAC, and catches (tonnes). Catches represents sum of the winter catches and the summer catches in the preceding fishing year. Source: 2020 MFRI Advice on ISS herring.[73]

Fiskveiðiár *Fishing year*	Tillaga *Rec. TAC*	Aflamark *National TAC*	Afli *Catches*
2010/11	40 000	40 000	43 533
2011/12	40 000	45 000	49 446
2012/13	67 000	68 500	71 976
2013/14	87 000	87 000	72 058
2014/15	83 000	83 200	94 975
2015/16	71 000	71 000	69 729
2016/17	63 000	63 000	60 403
2017/18	38 712[1)]	39 000	35 034
2018/19	35 186[1)]	35 186	40 683
2019/20	34 572[1)]	34 572	30 038
2020/21	35 490[1)]		

[1)] 15% aflaregla. *15% harvest control rule.*

[73] https://www.hafogvatn.is/static/extras/images/30-herring-11206946.pdf

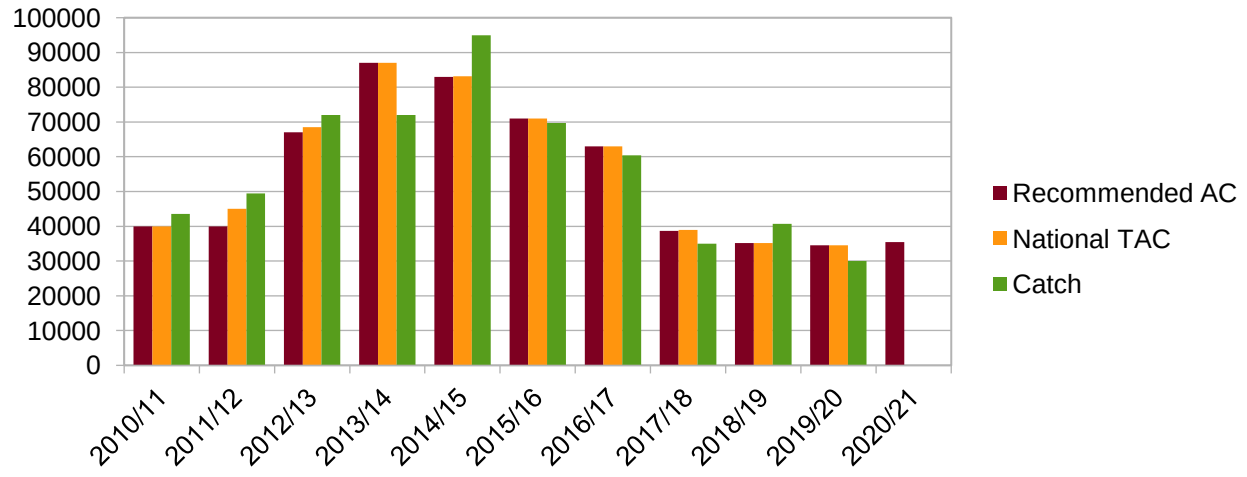

Figure 12. Recommended TAC, National TAC and Actual catch.

Clause 2.3 – Monitoring and Control

Clause 2.3.1 – Vessel registration and catch quotas

Supporting Clauses:	2.3.1.1, 2.3.1.2, 2.3.1.3, 2.3.1.4			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***Allocated catch quotas by species to registered vessels are assigned in such a way that the combined quotas conform to the currently effective decision on TAC. Accordingly, information on the size and composition of the fleet of fishing vessels shall be available and documented, and the catch quota of each vessel or vessel group for each fish species and fishing year shall be recorded in the official central database in a transparent manner.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

As the share of the TAC allocated to vessels is based on the number of shares for that particular species that the vessel owns the overall value of quota allocated cannot in the first instance exceed the TAC set by the Icelandic authorities (i.e. the currently effective decision on TAC). Note that within fishing seasons additional inter-annual, inter-species and/or inter-vessel transfers may cause the amount a particular vessel is allowed to catch to increase or decrease.

EVIDENCE

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 Directorate[74]. The official weight of the catch is subtracted from that vessels individual quota share for a particular species.

Should a vessel not have sufficient quota to cover its landings it may:

- rent in quota,
- transfer quota between species based on the cod equivalent values of each species,
- land the catch and keep 20% of the value of the overage (to cover for fuel/crew costs) while forfeiting the remainder 80% to scientific research or,
- transfer a limited amount to the following fishing season where it is taken off that vessels individual quota share for that species.

The catch quota of each vessel 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:

[74] http://www.fiskistofa.is/veidar/aflaheimildir/aflahlutdeildalisti/

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

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.

Coastal fishing

A total of 677 boats were licensed for coastal fishing in 2020 which is an increase of 48 licenses between years. Permit for coastal fishing are subject to conditions subject to the total allowable catch per day (650 kg cod equivalent) and the duration fishing trips (14 hours a day). The Directorate of Fisheries monitors by respecting these conditions, electronically[75]. Starting 2020 these smaller vessels have been using an app or e-logbook to record and submit all their catch and bycatch[76]. Each inshore fishing boat is authorized to engage in inshore fishing for 12 fishing days within each month.

[75] http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf
[76] http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla

Clause 2.3.2 – Fishing vessel monitoring and control systems

Supporting Clauses:	2.3.2.1, 2.3.2.2, 2.3.2.3, 2.3.2.4, 2.3.2.5, 2.3.2.6, 2.3.2.7, 2.3.2.8, 2.3.2.9, 2.3.2.10, 2.3.2.11, 2.3.2.12, 2.3.2.13, 2.3.2.14, 2.3.2.15, 2.3.2.16, **2.3.2.17**			
Important Note:	Clause 2.3.2.17 represents a new Clause in IRFM Standard v2.0 and is scored separately in Appendix 2.			
Clause Guidance:	***A program for the monitoring and control of fishing vessel activities shall be operated and enforcement shall be in place to prevent fishing by unauthorised vessels. Closed areas shall be monitored, the fishing gear and fishing logbooks shall be subject to inspection, as well as the composition of the catch and its handling onboard the fishing vessels. Catch amounts by species and fishing area shall be estimated and continually recorded in fishing logbooks on-board the fishing vessels. Discarding of catch from the stock under consideration shall be prohibited, those that may occur shall be monitored and all catches shall be landed in authorised fishing ports where harbour officials and fisheries inspectors shall monitor the correct weighing and registration of the catch. Accordingly, vessels must comply with all relevant National Fishery Management measures.***			
Evidence Rating:	Low ☐	Medium ☑		High ☐
Non-conformance:	Critical ☐	Major ☐	Minor ☑	None ☐

SUMMARY EVIDENCE

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. 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.

Discarding is monitored, by comparing the catches of vessels fishing in the vicinity of each other and, where unusual activity is detected, implementing closer surveillance of the vessel/s involved.

Data related to landings are processed in the Directorate´s database and catches are subtracted from vessels' quotas. 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). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines.

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, resulting in a Minor Non-conformance against supporting clause 2.3.2.4. Following the issuance of this non-conformance, and in accordance with rules of the IRF Programme, the Client has submitted a Corrective Action Plan (CAP) to address the non-conformance raised within a defined period. Updates on corrective action are presented here.

EVIDENCE

The Icelandic Coast Guard administers the VMS for all Icelandic vessels and for all foreign vessels (including fishing vessels) that enter Icelandic waters as part of an integrated monitoring, control and surveillance system. The purposes of the system are numerous, and it incorporates several related services including

maritime traffic control, marine search and rescue, fisheries enforcement, coastal radio and border control in a single Operations Centre[77]. The Directorate of Fisheries produce a risk analysis for the Coast Guard, enabling a strategic, risk-led approach to surveillance and best use of available resources over the large area monitored. The fisheries MCS system in Iceland has at its core the effective use of available technology meaning relatively small staff numbers can achieve extensive monitoring of the Icelandic fishing industry.

The integrated system uses all available data such as identification of the vessel, its movements, IUU lists, notifications, reports, fishing licenses, permits, port State control reports, etc. and has proved to be effective in combating and eliminating IUU fishing in the EEZ and the North Atlantic Ocean. Bilateral tracking agreements are in place with Greenland, Faroe Islands, Norway and Russia whose vessels must follow automatic procedures and report catches daily.

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). The assessment team has visited the Operation Centre and witnessed these systems in use.

The VHF and AIS systems have a range of 30 – 60 nautical miles while the satellite-based VMSs can be used anywhere in the world. The use of complementary systems ensures that the limitations that arise when any one system is used in a standalone capacity are mitigated. These electronic MCS systems are further backed up by more traditional methods of surveillance such as patrol vessels and aircraft; indeed, the use of electronic systems in the effective targeting of traditional surveillance methods increases the efficiency of these systems. Recently satellite imagery has been added to the list of surveillance methods (80 images are taken each month) which can be used for example in detection of the uncommon occurrence of vessels not using VMS.

Starting in 2020 (as communicated during the remote audit conference call), the ICG started using drones, initially to monitor coastal and salmon fisheries. Through the HD cameras on board they can monitor the activities of the coastal fleet including gillnetters, and compare catches between nearby boats to check for discards. This is done in the context of risk assessment, especially for areas where road access is problematic. The use of drone is intended as a preventative measure to discourage potential violators, and for monitoring purposes.

Emphasis is placed on data analysis including the use of VMS data in conjunction with other sources (e.g. IUU vessel lists, vessel registries, fishing licences, permits, port State control reports). The schematic below outlines the main inputs which make up the integrated MCS system in Iceland.

[77] http://www.lhg.is/media/LHG80/Landhelgisgasla_Islands_enska2_.pdf

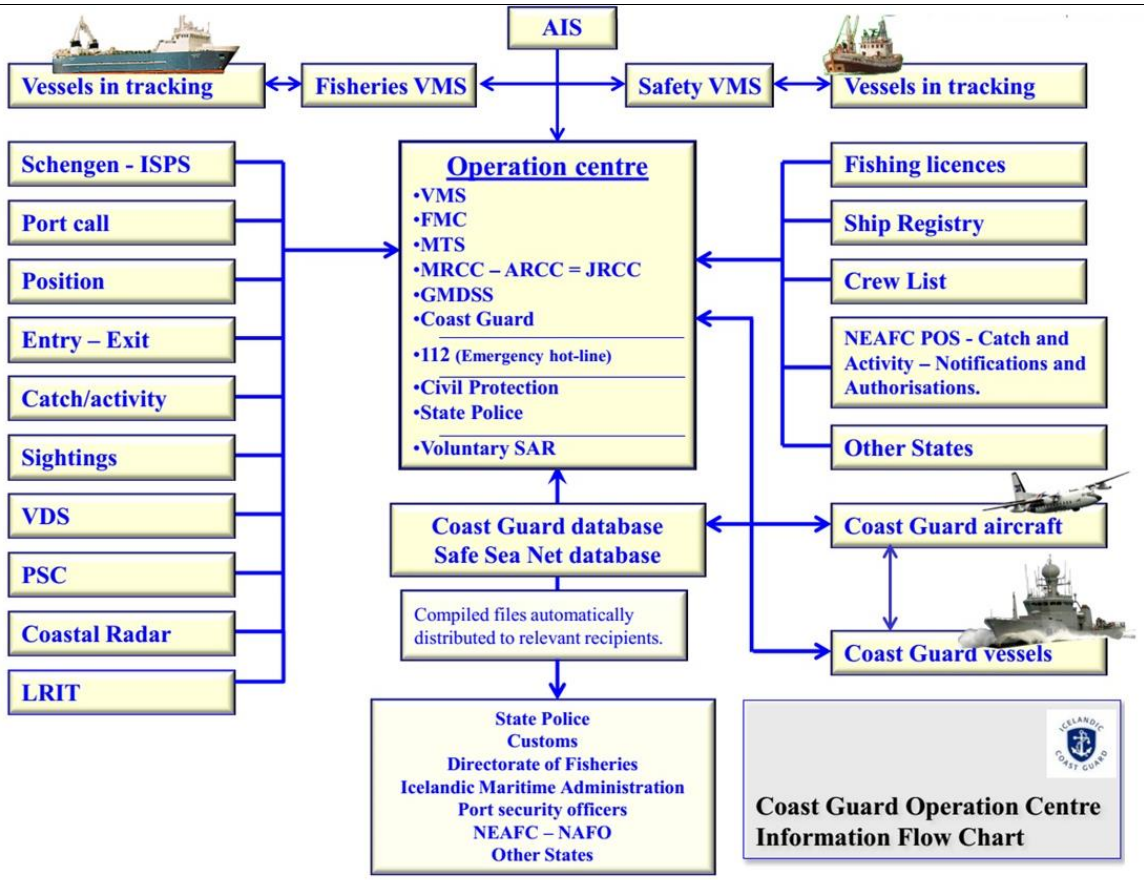

Figure 13. Schematic outlining the inputs which make up the integrated Monitoring, Control and Surveillance (MCS) system in Iceland (Source: presentation entitled Iceland's application for membership of the EU. Chapter 13, 28 February Icelandic Coast Guard ERS/VMS/AIS[78]).

The Coastguard conduct unannounced at-sea vessel boarding's in order to inspect gear, catch and catch records including logbooks as well as to perform inspections of mandatory safety equipment. The Coast Guard is currently investigating additional means to enhance detection of discarding to enhance the confidence of current discard estimates.

Inspectors of the Fisheries Directorate also accompany fishing vessels at sea during which they check fishing methods and catches, including gear configuration, mesh sizes, validity of fishing permits, correct recording in logbooks, the weighing and recording of catches as well as the species and size composition of the catch. The catch of vessels that are permitted to fully process catches on board is converted into a live weight based on the measured utilisation of the catch. The inspectors check that samples taken to monitor this process are correctly taken and accurately reflect the processing utilisation[79] [80]. It is a legal requirement that vessels give inspectors of the Fisheries Directorate and the Coast Guard access to their logbooks (see Article 8 of regulation on logbooks No. 746/2016)[81].

[78] https://slideplayer.com/slide/4644333/

[79] The Icelandic Directorate of Fisheries – Responsibilities and main tasks. Page 8. http://www.fiskistofa.is/media/utgefid_efni/DOF.pdf

[80] Fiskistofa Annual Report, 2017. Maritime surveillance chapter. http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-sjo/

[81] https://www.stjornartidindi.is/Advert.aspx?RecordID=42a16a67-60a7-4ae7-ad7c-0f53fc254654

Clause 2.3.2.4 – Minor Non-Conformance

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.

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. During the 2021 remote audit, 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 298/2020[82]. The App also called Afladagbókina or catch diary[83] [84] 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.

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.

Short term closures

Closures can be short-term (sudden closures) or long-term (regulatory closures)[85] and are primarily monitored and enforced by the Icelandic Coast Guard using the VMS system[86]. Vessels fishing in proximity to closed areas are monitored at the Coast Guard Operation Centre and vessels are directly contacted if they approach or encroach on prohibited areas; this is the first point at which the Coast Guard operator may issue a warning to the vessel and decide to escalate if necessary.

Data on Fiskistofa and ICG enforcement activities, including short term closures for the past year has been provided in Clause 2.1. Short term closures for juvenile herring (27 cm and smaller) in the fishery are implemented if the proportion of juveniles exceeds 25% in number (no. 376, 8 October 1992). No such closures took place in the 2019/2020 fishing season[87].

Discards

Discarding of commercial species is prohibited by law in Iceland (Article 2 of the Act Concerning the Treatment of Commercial Marine Fish, No. 57/1996) and this includes herring, although discards in this fishery are considered negligible[88], and none were reported in 2019/2020[89]. This means that if vessels do not have sufficient quota to cover the species they have caught they are required to attain quota through the quota transfer system. Consequently, if vessels do not have sufficient catch quotas for their probable catches they must suspend all fishing activities. Discarding is subject to penalty[90] (400,000 to 8,000,000 ISK or about 3,000 to 60,000 EUR). As noted in previous clauses, catches are monitored and should the composition of the catch (species, size) or its quality differ from other vessels fishing in the vicinity, the

[82] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887
[83] http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla
[84] https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/
[85] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Krokaaflamarksbatar
[86] http://www.lhg.is/media/LHG80/Landhelgisgasla_Islands_enska2_.pdf
[87] https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf
[88] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/her.27.5a.pdf
[89] https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf
[90] https://www.althingi.is/altext/pdf/131/s/0982.pdf

Fisheries Directorate has powers to place the vessel under closer surveillance by placing an inspector on board for one day or fishing trip. The vessel must pay the Directorate's costs (e.g. inspector wages) if this occurs more than once in a fishing year (Article 13 of Act No. 57/1996).

The discard ban has some inbuilt flexibility, as any 5% of demersal 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 Fisheries Commission Project or 'VS fund', under the auspices of the Ministry). The maximum of 20% return on VS catches means that there are limited incentives to land it; however, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, preventing discards, improving the treatment of the fishery resource and promoting responsible fishing practices.

A discard project has been established by the Fisheries Directorate, in collaboration with the MFRI, to examine and evaluate discarded fish under a specific length and with a specific fishing gear. The project focuses on cod and haddock. Discards of ISS herring are considered negligible. The results of the research are published in Fiskistofa's annual report[91].

Landings

All Icelandic catches from Icelandic waters must be landed and weighed in registered Icelandic ports. Exceptions are made for special circumstances e.g. serious engine failure in which case the Fisheries Directorate may authorise landings abroad (Article 5 of Act No. 57/1996).
Separation by species (if not already done on board), weighing and recording of the catch must occur within two hours of landing. Weighing is undertaken on official port scales certified by the Fisheries Directorate and operated by individuals authorised by the Directorate.

As required by Article 10 of Regulation No. 745/2016, each landing generates a weighing receipt[92,93] recording:

- Vessel name, registration number and district number;
- Landing port and date of landing;
- Name of seller, buyer and recipient of the catch;
- Official weight by species of catch;
- Proportion of undersize fish in catch;
- Number, type and weight of tubs/boxes/barrels;
- Fishing gear used;
- Total number of pallets of platforms;
- Registration number and tare of transport vehicle;
- Whether catch is to be re-weighed;
- Whether any of the catch is un-gutted and needs to be either weighed after gutting or converted to a gutted weight using coefficients provided by Directorate.

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. Monitoring of weighing license holders is risk-based with the aim of directing surveillance where it is most needed. Assessment of risk is based on various factors such as the quantity weighed, number of weighings, the number of vessels that land with the licensee concerned, etc. Recently,

[91] http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2016/
[92] https://www.fmis.is/blank
[93] http://www.unuftp.is/static/fellows/document/pan09prf.pdf

attention has been focussed on the percentage of ice measured during weighing of catches by weighing licensees. After gross weighing on the port scale, it is permissible to send catch for re-weighing in fish processing companies or on a fish market which has been authorized for re-weighing catch. The catch is then either balanced or sampled according to certain rules, ice is separated, and the net weight of the fish is found.

During the 2021 remote audit, Fiskistofa confirmed that they worked on this issue by increasing surveillance. As a result, two more cases were detected in 2020. The results of this surveillance are published online to show the violations and deter other potential violators[94].

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 990/2020 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 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.[95].

Deviations and flexibility measures

As noted in clause 2.1.1, 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. All processors purchasing fish, be it directly or at auction, are obliged to submit monthly reports to the Directorate. In addition, the fish auction reports all sales of fish directly to the Directorate.

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). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines[96].

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.

Gear loss and marking

[94] http://www.fiskistofa.is/umfiskistofu/frettir/hlutfall-kaelimidils-mai-til-agust
[95] http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf
[96] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Vidurlog

There are a number of initiatives and regulations in place to avoid the loss of fishing gear and subsequent ghost fishing of lost and abandoned gear. Where the Fishing Directorate finds and recovers lost or abandoned gear they recover the cost of recovery from the gears' owner. The Coastguard also reports any buoys it feels might represent lost or abandoned fishing gear to the Directorate. All regulations relating to fishing gear may be found in the various Articles of Fisheries Management 2020/2021 Laws and regulations[97]. During the November 2018 site visits and the current remote audit in 2021, the directorate confirmed that gear loss (e.g. longlines, gillnets) and as such ghost fishing is not considered an issue in Iceland, in part because of the ITQ system, and that reporting lost gear is compulsory. Another important factor that contributes to low levels of lost fishing gear is the high price of that gear. This means that fishers are careful to avoid losing their gear. In the case of trawls the majority of vessels carry special grapples onboard that allow them to retrieve lost gear even when both towing warps have parted, which is a rare situation. The Icelandic ITQ system allows for a slower paced fishery than would be expected if there was only an overall TAC with all boats fishing against it. The system allows fishers to target their efforts in optimum weather conditions leading to decreased rates of lost fishing gear.

[97] https://vefbirting.prentmetoddi.is/raduneyti/stjorn_fiskveida_2020-21/94/

Clause 2.3.3 – Catches are subtracted from relevant quotas

Supporting Clauses:	2.3.3.1, 2.3.3.2, 2.3.3.3, 2.3.3.4, 2.3.3.5			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***Landed catches shall be subtracted from the relevant quotas (allowable catch) of the vessel or vessel group. Limited allowance may be made for the use of quota for one species to count against landings of another species, with the objective of providing the necessary minimum flexibility and discouraging discards. Transfer of quota between vessels shall take effect only after it has been authorised and recorded to the official central data base and information on each vessels catch quota and quota use shall be updated regularly and made public and accessible to all on the official website, thus ensuring transparency.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Landed catches are subtracted from the relevant quotas (allowable catch) of the vessel or vessel group. Vessels must weigh catch within two hours of landing. The official weighed catch for each vessel is then submitted by the Port Authority to the Fisheries Directorate's catch registration system and deducted from the vessel's quota. Comparison of the official weighed catch is made with the vessels logbook as part of this process. Transfers of quota to meet any shortfall are also monitored to ensure any additional quota required is secured. Processed at sea catch is also monitored, including its conversion to live weights which are then deducted from the vessel's quota.

Some flexibility occurs in the quota management system so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels and to discourage discarding. This includes provision for some limited quota transfer between different species using 'cod-equivalents'.

EVIDENCE

As noted in clause 2.1, information from fresh fish landings is collected through the portside official weighing system which is carried out by official staff and calibrated systems. Vessels must weigh catch within two hours of landing on the quay. The system is developed to standardise weights and tares for ice and tubs (a standard tub is used throughout Iceland for fresh fish and has a capacity of 280-300 kg). The weight registration document for each vessel is transmitted to the Directorate which also receives the e-logbook information. These two sets of information are then compared, and the appropriate reduction is made to the vessel quota. Any transfer under the ITQ system for each vessel is also monitored to ensure that any additional quota requirements are rented from other vessels within a 3-day period as required by law (Act No. 57/1996). The reporting system is near real time (circa. 24 hours).

The officially weighed catches are the official catch of record on which subsequent deductions from vessels' quota is based with e-log information being used as a secondary source to ensure accuracy.

Processed at sea catch is 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.

Cod equivalents

The determination of cod equivalent coefficients is based on Article 19. Act no. 116/2006 on fisheries management:
The Ministry shall calculate the cod equivalent before 15 July each year for each species that is subject to a decision on fisheries management, cf. Article 20, and take into account a twelve-month period beginning on 1 May of the previous year and ending on 30 April. Cod equivalents shall be calculated as the proportion of the value of individual species that are subject to a decision on the management of fishing of the value of gutted cod. The value calculation shall be based on the total catch volume and the total value of these species according to information from the Directorate of Fisheries. When fish is sold fresh abroad, 88% of its sales value shall be used. In the case of demersal fish, with the exception of redfish, gutted fish shall be used.

The following factors are in accordance with the decisions of the Ministry of Fisheries on the value ratios of individual species and apply to the relevant fishing year. The cod equivalent coefficients of several species are based on calendar years, e.g. 2001/2002 = 2002, 2000/2001 = 2001 etc. This applies to Norwegian-Icelandic herring, Arctic cod, blue whiting, redfish and shrimp in the Flemish Basin. Figures for cod equivalents are available at http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/.

All transfers of quota must be authorised by the Fisheries Directorate. The Directorate of Fisheries must be notified of the transfer of quota and must receive this no later than 15 days after the end of the fishing season. Application forms for the transfer of quota are available online[98] and must be transmitted directly to the Directorate for authorisation of the transfer. Information on the catch quota, including quota transfers, of each vessel or vessel group, is recorded in the official central database (GAFL) (see evidence presented in clause 2.3.1.3).

[98] http://www.fiskistofa.is/eydublod/flutningurveidiheimilda/

Clause 2.3.4 – Rules are enforced

Supporting Clauses:	2.3.4.1			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	**Surveillance and enforcement of rules are carried out by the Icelandic Coastguard, the Marine Research Institute and the Fisheries Directorate. There are various penalties for serious infractions depending on the nature of the infraction and the number of times the offender has contravened the regulations.**			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Rules are enforced by the Icelandic Coast Guard and Fiskistofa. The overall level of compliance appears to be adequate.

EVIDENCE

There is a clearly established legal framework which sets out rules and regulations relating to fishing activity within Icelandic waters and gives powers to the Ministry, the Fisheries Directorate, the Coast Guard and the MFRI to monitor fishing activities and enforce these rules. The penalties for violation of the laws and regulations have been described in clause 2.1 and range from the issue of reprimands by the Directorate of Fisheries and the suspension of commercial fishing permits to confiscation of gear and catch, fines and, in cases of serious or repeated deliberate violation, imprisonment for up to six years (for example, Articles 24 and 25 of Act No. 116/2006[49]; Articles 15-17 of Act No. 79/1997[Error! Bookmark not defined.]; Chapter 4 of Act no. 57/1996[52]).

Rules are enforced by the Icelandic Coast Guard and Fiskistofa. The overall level of compliance appears to be adequate. Please refer to the information, tables and figures provided under clause 2.1.

Clause 2.3.5 – Analysis is carried out

Supporting Clauses:	2.3.5.1, 2.3.5.2, 2.3.5.3			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***Analysis shall be carried out with the aim of detecting any deviations that may occur of the actual total catch from the Total Allowable Catch (TAC). Measures are available and are adopted when indicated. Anyone purchasing and/or selling catches shall be obligated to present reports to the appropriate authorities, containing information on the purchase, sale and other disposition of fish catches.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Analysis shall be carried out with the aim of detecting any deviations that may occur of the actual total catch from the Total Allowable Catch (TAC). Measures are available and are adopted when indicated.

EVIDENCE

Given the fact that all catches are recorded on the central database any deviations between actual total catch and the TAC for a particular species are easily detectable. Note that deviations may be attributable to the legitimate inter-species, inter-vessel or inter-annual quota transfers but, in any case, where there are anomalies analysis is carried out to determine the root cause of the deviation. Reasons for deviations include the following:

- Transfer of quotas between years, which is legal within bounds.
- Transfer of quotas between species is possible to some extent, but quotas of other species cannot be used to cover cod catches.
- The smallest boats have a different system for limiting catches, which is essentially an effort control system. Predicted catches in that system were accounted for when setting the general TAC in the ITQ system, but the catches tended to exceed predictions. The current effort control system for the small boats that started in 2009, includes TAC constraint so catches should not exceed TAC by large amount (1-2%).
- There are some fisheries outside the general quota system, see Clause 1.1.3
- Catches that would be illegal to sell (for example undersized fish) shall still be landed and sold, but the vessel gets only a minor part of the payment. The rest goes to a fund to support research. The amount is only partially subtracted from the quota.
- The Faroes and Norway have some small fishing rights in Icelandic waters which in some, but not all years have been accounted for when setting the national quota.

For the last decade, both before and after the introduction of the HCR in 2017, the scientific advice has been according to the rule and quotas have been set according to the scientific advice with minor exceptions (Figure 14). The actual catch can deviate from the TAC, up to about 15% in both directions, A likely cause is the year-to-year flexibility that is permitted. Over time, this levels out – the sums of catch and TAC over 10 years is almost equal.

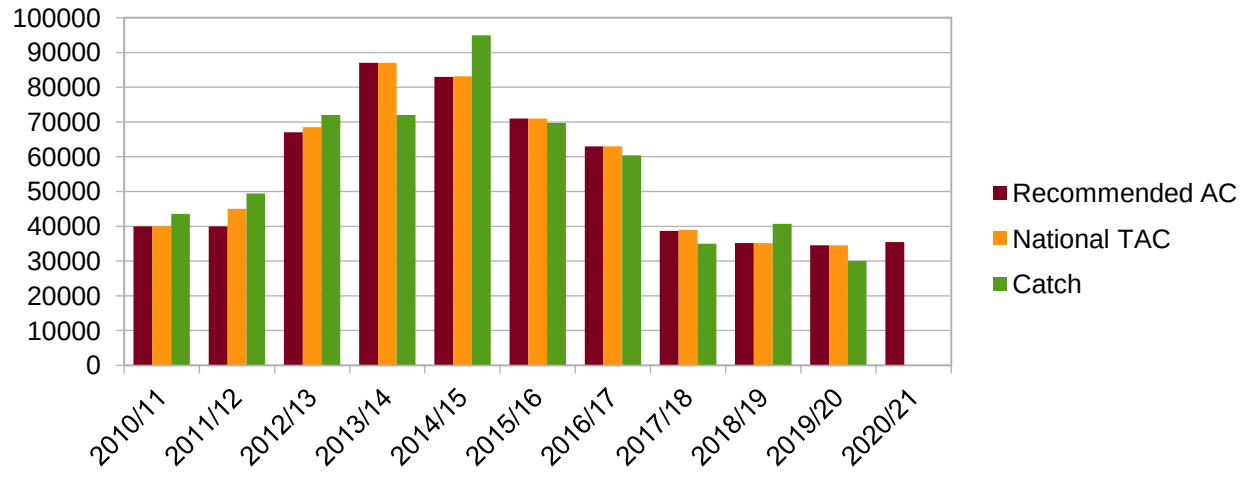

Figure 14. Recommended TAC, National TAC and Actual catch.

7.3. Section 3: Ecosystem Considerations

Clause 3.1 – Guiding Principle

Supporting Clauses:	3.1.1, 3.1.2			
Important Note:	Clause 3.1.1: Text added (**Bold**) in IRFM Standard v2.0: *Adverse impacts of the fishery on the ecosystem shall be considered and appropriately assessed and effectively addressed,* ***consistent with the precautionary approach***[99]*.* Clause 3.1.1 (minor change) – consistency with precautionary approach specifically addressed below.			
Clause Guidance:	***Adverse impacts of the fishery on the ecosystem (e.g. bycatch, ETP species interactions, habitat and foodweb interactions etc.) shall be considered, appropriately assessed and effectively addressed. Those impacts that are likely to have serious consequences shall be addressed. This may take the form of an immediate management response or further analysis of the identified risk.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Most commercially fished species in Iceland, target or non target, are now part of the ITQ system and as such they are retained and accounted for within the catch accounting system operated by Fiskistofa. 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. Discarding is prohibited. There are vulnerable and /or Endangered, Threatened and Protected (ETP) species occurring in Icelandic waters according to OSPAR.

E-logbooks recording of all marine mammals and seabirds catches (by species and numbers) is a legal requirement (Reg. 126/2014). A smartphone App has been deployed by the Directorate of Fisheries to make both reporting and identification of bycatch easier for small boat operators in the fishery. Interactions between fishing gears and the seabed are highly dependent on gear type with towed bottom gears such as demersal trawls and dredges having a greater impact than static gear such as longlines, set nets or pots.

It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; coldwater corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Large areas within the Icelandic EEZ are closed, either temporarily or permanently, to fishing for a variety of reasons; these include the protection of juveniles, spawning fish and VMEs. Cumulatively, a large portion of Icelandic shelf area within which fishing activities occur is closed to bottom trawling.

EVIDENCE

99 In this context refer to 2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries, Article 31: Adverse impacts of the fishery on the ecosystem should be appropriately addressed. Much greater scientific uncertainty is to be expected in assessing possible adverse ecosystem impacts of fisheries than in assessing the state of target stocks. This issue can be addressed by taking a "risk assessment/risk management approach". For the purpose of development of ecolabelling schemes, the most probable adverse impacts should be considered, taking into account available scientific information, and traditional, fisher or community knowledge provided that its validity can be objectively verified. Those impacts that are likely to have serious consequences should be addressed. This may take the form of an immediate management response or further analysis of the identified risk....

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 page[100] for each individual species.

KOLMUNNI – BLUE WHITING (*Micromesistius poutassou*)[101]

Fishing mortality (F) is estimated to be above FMSY since 2014. Spawning-stock biomass (SSB) has been decreasing since 2018; however, it is estimated to remain above MSY Btrigger. Recruitment (R) from 2017 to 2020 is estimated to be low, following a three-year period of high recruitment.

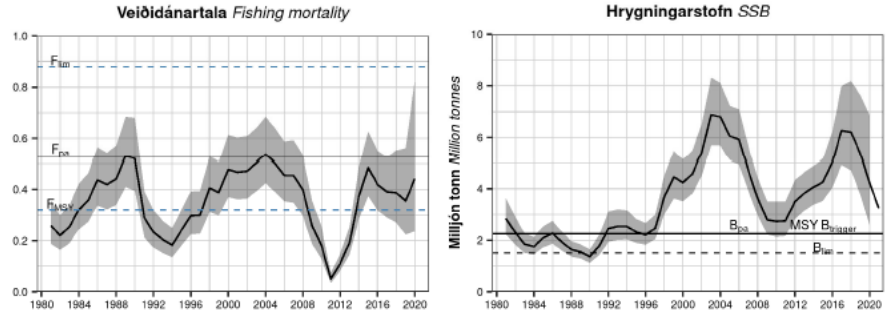

Figure 15. Blue whiting harvest rate and biomass.

LOÐNA – CAPELIN (*Mallotus villosus*) [102]

According to an acoustic survey in latter half of January 2020, the SSB was estimated 650 000 tonnes, combined. The harvest control rule (HCR) aims at leaving with 95% probability at least 150 000 tonnes (Blim) of mature capelin at the time of spawning in March when accounting for predation. Model projections show that with maximum catch of 127 300 tonnes the HCR expectations will be achieved.

[100] https://www.hafogvatn.is/en/harvesting-advice
[101] https://www.hafogvatn.is/static/extras/images/kolmunni_20201214680.pdf
[102] https://www.hafogvatn.is/static/extras/images/lodna4febr20211236376.pdf

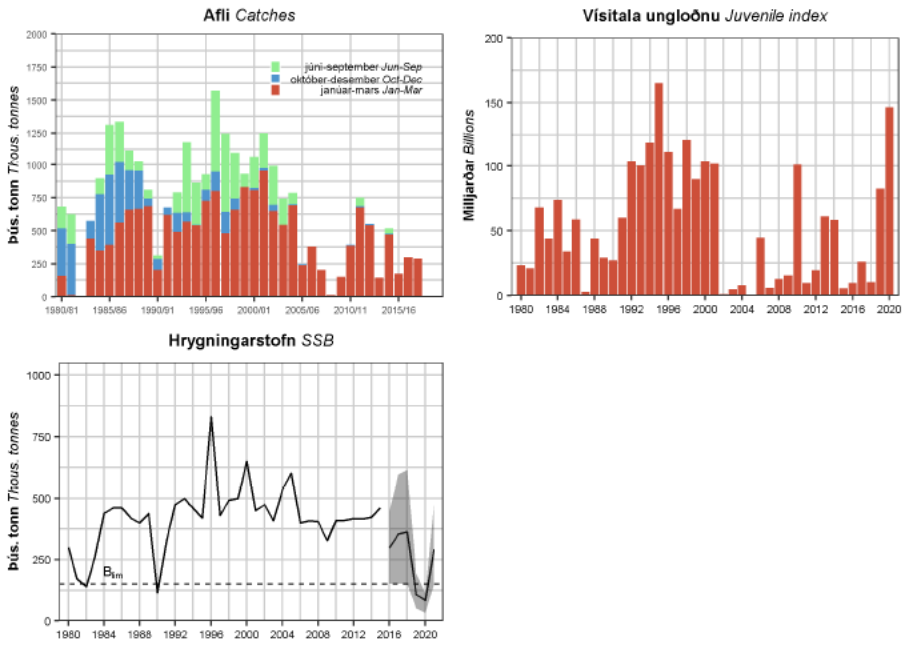

Figure 16. Capelin. Catches, acoustic index for immatures from autumn surveys, and SSB at spawning time after harvesting (with 90% confidence limits since 2016). The SSB value for 2016 and onwards is not directly comparable to historical values because it is based on different assumptions about natural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

MAKRÍLL – MACKEREL (*Scomber scombrus*)[103]

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. The fishing mortality (F) has declined since 2003, and is estimated to have been below FMSY since 2016. There has been a succession of large year classes since 2001, with year classes since 2011 estimated to be above average.

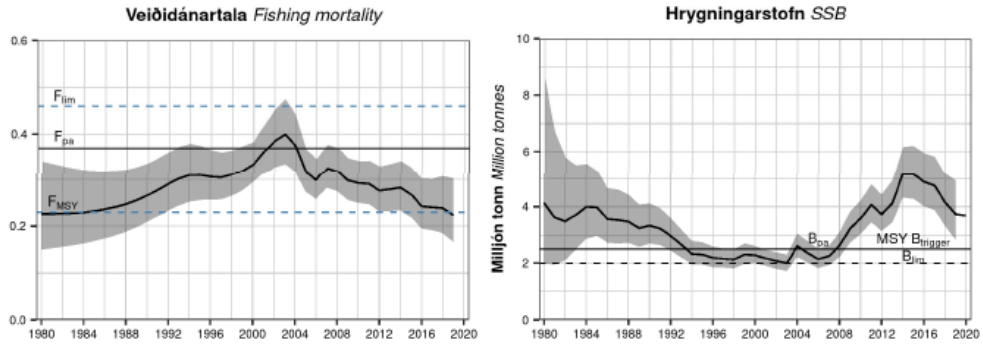

Figure 17. Mackerel harvest rate and biomass.

NORSK-ÍSLENSK VORGOTSSÍLD NORWEGIAN SPRING-SPAWNING HERRING (*Clupea harengus*)[104]

ICES advised 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 2021 should be no more than 651 033 tonnes.

[103] https://www.hafogvatn.is/static/extras/images/makrill_20201214678.pdf
[104] https://www.hafogvatn.is/static/extras/images/sild-ni_20201214682.pdf

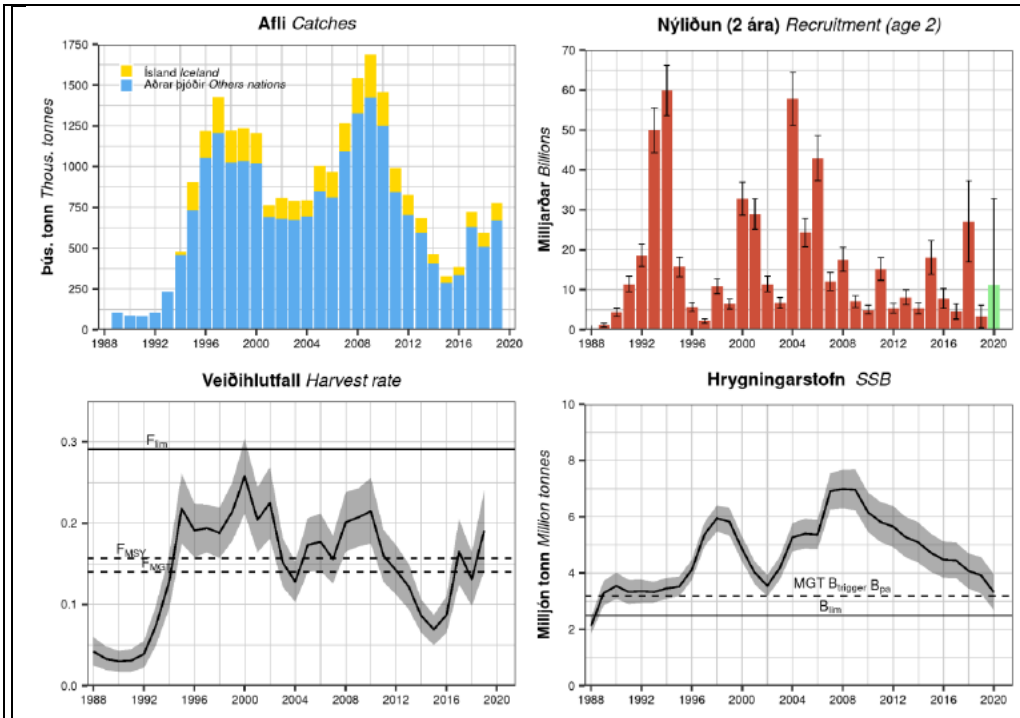

Figure 18. Catches, recruitment at age 2, fishing mortality and spawning stock biomass (SSB). Assessment run starts in 1988, when the stock has started to rebuild after collapse in the 1960s. Recruitment 2020 is based on Median stochastic recruitment based on the years 1988–2019.

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*)[105] and porbeagle (*Lamna nasus*), basking shark (*Cetorhinus maximus*) and spurdog (*Squalus acanthias*)[106] 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 (2016 to 2020) 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 in[107]). 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

[105] Regulation 470/2012. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302
[106] Regulation 456/2017. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017
[107] 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

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 in[108]) 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. [109] 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)[110].
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).

Updates from the 2021 audit and remote site visit are presented below. Below is the latest (available) reported bycatch from the fishing fleet by gear that has been provided by the MFRI. 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.

Table 12. Bycatch of marine mammals and seabirds by gear type in 2016-2019 as reported by the fishing fleet. Source MFRI, January 2021.

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
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

[108] NAMMCO https://nammco.no/topics/killer-whale/#1475844082849-433d5060-e5a9

[109] https://nammco.no/wp-content/uploads/2020/03/npr-is_national-progress-report-2019-iceland_nammco28-20205.pdf
[110] https://nammco.no/topics/killer-whale/

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**

Most recent estimates of marine mammal and seabird bycatch can be found in the table below. The MFRI highlighted that these numbers are from a technical report that will be published in the spring. The estimates are stratified by area (four areas) and based on inspector records and MFRI survey data (gillnets). The estimate for common loon has extremely low precision, as it is based on one incident when 3 birds were caught. It is the only event of loon bycatch that we have observed, which suggests that bycatch is rarer than this estimate suggests. The same applies for other species that have estimates only based on 1-2 incidents.

Table 13. Estimates of annual bycatch of marine mammals and seabirds by gear type and area for the period 2016-2019. Numbers are shown raised by effort, but observed animals are shown in brackets. Source MFRI, January 2021.

Cod and Greenland halibut gillnets						
Species/Area	NW	NE	SW	SE	Total	95% CI

Harbour porpoise	222 (25)	231 (28)	207 (40)	151 (26)	811 (119)	575-1065
Harbour seal	18 (2)	0 (0)	0 (0)	0 (0)	18 (2)	0-44
Grey seal	9 (1)	0 (0)	0 (0)	0 (0)	9 (1)	0-27
Harp seal	9 (1)	58 (7)	0 (0)	0 (0)	67 (8)	25-126
Ringed seal	9 (1)	0 (0)	0 (0)	0 (0)	9 (1)	0-27
White beaked dolphin	18 (2)	0 (0)	0 (0)	0 (0)	18 (2)	0-44
Total marine mammals	285 (32)	289 (35)	207 (40)	151 (26)	930 (133)	600-1332
Common guillemot	248 (28)	41 (5)	145 (28)	0 (0)	434 (61)	297-594
Northern fulmar	0 (0)	8 (1)	104 (20)	6 (1)	118 (22)	67-187
Common loon	0 (0)	25 (3)	0 (0)	0 (0)	25 (3)	8-49
Brünnich's guillemot	9 (1)	0 (0)	10 (2)	0 (0)	19 (3)	0-52
Eider	0 (0)	16 (2)	0 (0)	0 (0)	16 (2)	0-41
Total seabirds	257 (29)	91 (11)	259 (50)	6 (1)	612 (98)	373-924
Longlines						
Species/Area	NW	NE	SW	SE	Total	95% CI
Northern gannet	267 (12)	0 (0)	200 (13)	0 (0)	467 (25)	263-693
Northern fulmar	2115 (95)	957 (57)	46 (3)	598 (10)	3716 (165)	2829-4636
Herring gull	111 (5)	0 (0)	0 (0)	0 (0)	111 (5)	44-200
Lesser black-backed gull	779 (35)	0 (0)	0 (0)	0 (0)	779 (35)	579-1002
Total seabirds	3272 (147)	957 (57)	246 (16)	598 (10)	5073 (230)	3715-6531
Demersal trawl						
Species/Area	NW	NE	SW	SE	Total	95% CI
Grey seal	17 (1)	0 (0)	0 (0)	0 (0)	17 (1)	0-50
Harp seal	17 (1)	0 (0)	0 (0)	0 (0)	17 (1)	0-50

Total marine mammals	34 (2)	0 (0)	0 (0)	0 (0)	34 (2)	0-100
Northern gannet	0 (0)	0 (0)	21 (1)	0 (0)	21 (1)	0-62
Total seabirds	0 (0)	0 (0)	21 (1)	0 (0)	21 (1)	0-62

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 2009–2013 and down to about 750 animals in 2014-2015[111]. Of the updated numbers provided in the tables above by the MFRI during the remote site visits in January 2020 we note that the estimated bycatch of harbour porpoise between 2016 and 2019 are comparable to those of 2014 and 2015. Furthermore, a harbour porpoise status update from NAMMCO is provided below.

Harbour Porpoises (*Phocoena phocoena*)

Harbour porpoises are classified as Least Concern in the IUCN Red List[112] (population trend unknown, last assessed in 2020). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)[113]. Annual estimates of harbour porpoise by-catch have decreased in recent years as gillnet effort has decreased (see table below), from a high of 7,300 animals in 2003 to about 1600 animals in 2009–2013[114] 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)[115] reported the following about the Icelandic harbour porpoise population.

The assessment for Iceland made during the Tromsø WS was discussed. Although there are indications that the Icelandic population is part of a larger North Atlantic one, for pragmatic reasons a separate assessment was carried out. There was a significant effort in the 1990s to collect samples for analysis of biological parameters and payments are still being offered to fishermen for genetic samples from by-caught animals.

Analysis of all sampling efforts is planned to be finalised at the end of 2019. One absolute abundance estimate from a harbour porpoise survey in 2007 is available (although should be treated with caution since the aerial survey covered an unknown fraction of the area of distribution). Two relative abundance estimates from genetic close-kin analysis were also used in the assessment. The WG agreed it was not clear whether it was appropriate to use close-kin genetic analysis and that appropriate expertise to provide a sufficiently competent review of this as an approach for estimating abundance was lacking.

Direct hunting of harbour porpoises is not widespread in Iceland but there is significant by-catch, particularly in the gillnet fishery for lumpfish (primarily) and the cod gillnet fisheries. Efforts to reliably estimate the extent of this by-catch are ongoing. The WG reran the population model with some changes and agreed that although there was sufficient information available to run the same model for Iceland as used for Greenland, it would require more time.

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.

Seals and white beaked dolphin

[111] See Figure 55 of the February 2020 IRFM Icelandic Cod Re-Assessment Report available at https://www.responsiblefisheries.is/certification/certified-fisheries/cod

[112] https://www.iucnredlist.org/species/17027/50369903

[113] https://www.ni.is/node/27406

[114] 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

[115] https://nammco.no/wp-content/uploads/2019/02/final-report_hpwg-2019.pdf

The updated bycatch data on seals and white beaked dolphin is similar to or less in numbers to the data from 2014-16 analysed in the cod re-Assessment report. The yearly removals are considered to be small at 9-18 individuals from gillnets gear and 17 individuals (grey seals) from bottom trawl, and unlikely to have any effects to any of these species. The bycatch of harp seal was estimated at 67 individuals annually and 17 individuals in bottom trawls, also considered to be unlikely to negatively affect the population, considering that the species is classified as Least Concern on the IUCN Redlist (2015 assessment, population trend increasing and estimated globally at 4,5 million mature individuals)[116]. There is no updated information on these species' population abundance from the MFRI Advice website as of the spring of 2021, but we note the study highlighted below.

Punt et. al. 2020[117] published a Management Strategy Evaluation(MSE) study applied, for illustrative purposes, to export fisheries in Iceland that impact harbor porpoises (*Phocoena phocoena*), harbor seals (*Phoca vitulina*), and grey seals (*Halichoerus grypus*). Several management strategies were evaluated. The cod fishery is the largest source of human-caused mortality of harbor porpoises in Iceland, but the porpoise population is assessed to be above maximum net productivity level (MNPL) currently and is predicted to continue to increase despite current levels of human-caused mortality. In contrast, the major source of mortality for the two seal species is bycatch in the lumpfish fishery. Harbor seals, in particular, are declining, and unless the impacts of the lumpfish (*Cyclopterus lumpus*) fishery are reduced, this downward trend is predicted to continue.

Seals hunting prohibition

At the end of December 2019, a new regulation no. 1100/2019 on the prohibition of seal hunting was published. The regulation applies to prohibition hunting for all seal species in Iceland. The regulation states that seal hunting is not permitted in Icelandic for all areas (in the sea, rivers and lakes) except in special circumstances that may be licensed by the Directorate of fisheries[118].

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 are planned in 2021 (MFRI, personal communication, 12 January 2021).

Seabirds

For seabirds, the highest estimated bycatch numbers between 2016 and 2019 are those of common guillemot (gillnet), Nothern fulmar, longline and gillnet), lesser black backed gull and northern gannet (both caught with gillnets.

Table 14. Estimates of annual bycatch removal of seabirds species.

Species	Cod gillnets	Longline	Otter trawl	Iceland Institute of Natural History (INH) Red List Classification	Population estimated in INH's 2018 Red List	Annual bycatch % removal of estimated population*
Northern fulmar (*Fulmarus glacialis*)	118	3716	0	Endangered	1.2 million pairs	0.14%
Common guillemot (*Uria aalge*)	434	0	0	Vulnerable	693,000 pairs	0.03%
Northern gannet (*Morus bassanus*)	0	467	21	Vulnerable	37,000 pairs	0.66%

[116] https://www.iucnredlist.org/species/41671/45231087#population
[117] https://cdnsciencepub.com/doi/full/10.1139/cjfas-2019-0386
[118] http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

Brünnich's guillemot (Uria lomvia)	19	0	0	Endangered	327,000 pairs	0.003%
Herring gull (*Larus argentatus*)	0	111	0	Near Threatened	5,000–10,000 pairs	0.74%
Lesser black-backed gull (*Larus fuscus*)	0	779	0	Data Missing	42,000 pairs	0.93%
Common loon (*Gavia immer*)	25	0	0	Vulnerable	279 pairs[119]	4.48%
Common eider (*Somateria mollissima*)	16	0	0	Vulnerable	850,000 birds	0.001%

For all birds but common loon the removals are considered quite limited and unlikely to significantly hinder recovery of these seabirds.

Common Loon

Last assessed in 2018, this species is categorised as Least Concern in the IUCN Red List with a stable global population trend. Wetlands International (2016) estimated the population at 612,000-640,000 individuals. In Europe the breeding population is estimated at 700-1,300 pairs, which equates to 1,400-2,600 mature individuals (BirdLife International 2015).[120]

A minor non conformance on common loon is currently open and active for in the cod fishery and is been addressed accordingly.

Updates on sharks and rays, Atlantic halibut and whale species

Subsequent from the fishery initial full assessment in 2019[121] analysis of ETP species we note that the MFRI provided the following update information relating to fisheries effects.

Sharks and rays

A total of five leafscale gulper sharks have been landed for the last 10 years, all caught in demersal trawl. They are occasionally caught in the trawl fisheries south of the country. Leafscale gulper sharks are usually only found in waters deeper than operated in the main Icelandic commercial fisheries. More leafscale gulper sharks than average have been caught in the MFRI annual autumn survey over the last 5 years or so, as shown below.

[119] Presumably the population is now somewhat larger, as there are about 500 known nesting sites and the nesting is densest in Mýrar, the heaths up from Dalarna, in Húnavatnssýsla and Borgarfjörður, on Skaga, Norður-Slétta, near Mývatn and in Veiðivötn. Source: https://www.ni.is/node/27141

[120] https://www.iucnredlist.org/species/22697842/132607418#population

[121] https://www.responsiblefisheries.is/media/1/form-11.2-iceher-initial-assessment-final-report-and-determination.pdf

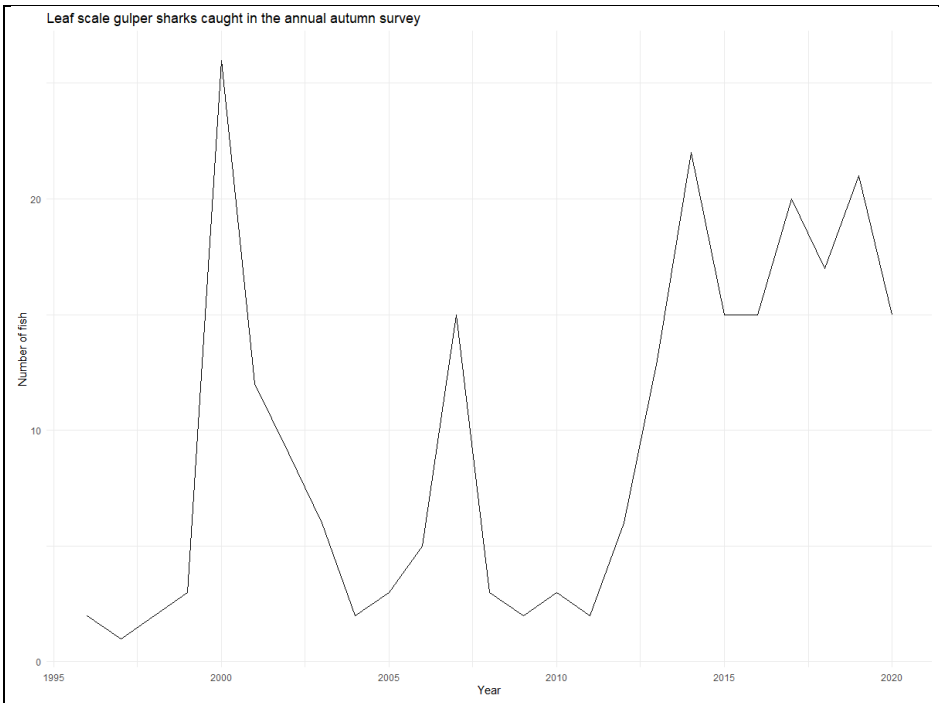

Figure 19. Leaf scale gulper shark caught in the annual autumn survey. Source: MFRI, January 2021.

No basking sharks have been reported or recorded in these fisheries over the last 10 years and the same can be said for surveys and inspector trips.

Grey skate (*Dipturus flossada / batis*)

Landed catch for the past 5 years has ranged between 127-203 tonnes annually. The population of *D. batis* in Icelandic waters seems to be increasing for the last 10 years or so, despite some bycatch in the longline and bottom trawl, as shown in the figure below.

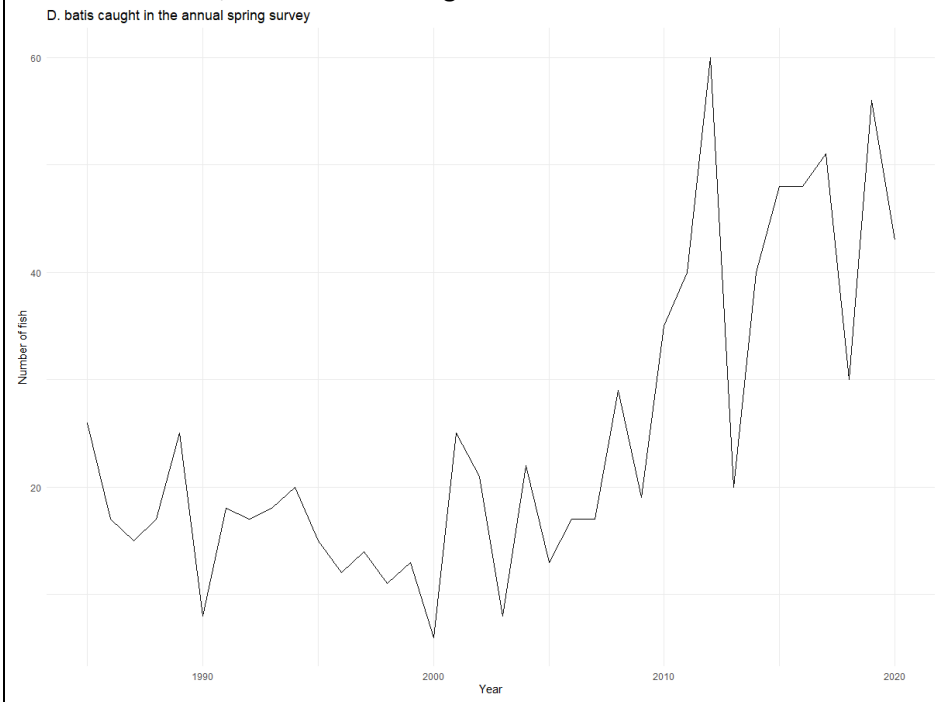

Figure 20. Grey skate caught in the annual spring survey. Source: MFRI, January 2021.

Dogfish, porbeagle and Greenland shark

Regulation 456/2017 states that there is a ban on fishing for Porbeagle sharks, Basking shark and spiny dogfish. Any incidental catches of these species are to be landed and sold on an approved auction market for marine products according to the provisions of Act no. 37/1992, on a special fee for illegal fishing, with subsequent amendments. [122] This is the same mechanism adopted (i.e. VS catches) for Atlantic halibut catches, for which directed fishing is banned. Catches of banned species are sold and 80% of the value goes to a MFRI research fund and only 20% to the fishermen. These VS catches measures are meant to facilitate the landing of every species, discourage potential targeting and avoid discarding.
For these species there is very limited information available and commercial catches are only of a few tonnes per year, per species. They are occasionally caught in both the commercial fishery and surveys, but not in enough quantity to discern any trends. No catches have been recorded in recent years for the gear types used to catch herring (exclusively pelagic trawl in the past 5 years).

Atlantic halibut[123]
IS-SMB recruitment and biomass indices decreased rapidly between 1985 and 1990 and have remained low since. However, the biomass index is currently higher than in 2008-2014 when it was at a historically low level, as shown below. Catches have been extremely small in the past decade. Only 57 kg of Atlantic halibut have been caught in pelagic trawls in the past 5 years.

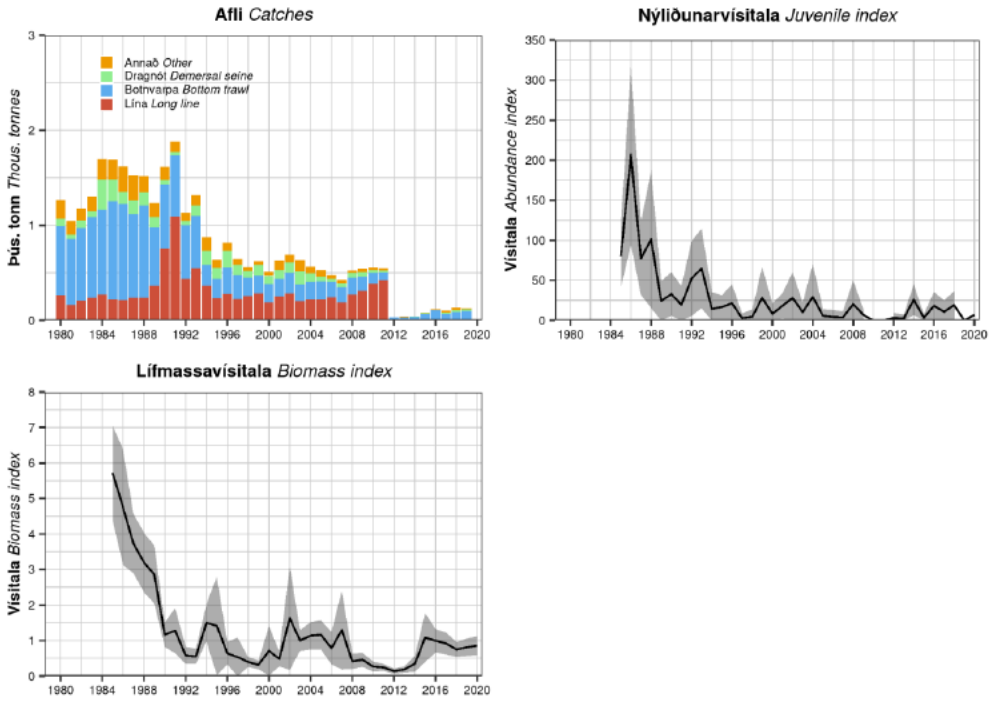

Figure 21. Catch by gear type, IS-SMB juvenile (≤30 cm) and biomass (≥40 cm) indices. Grey areas represent 95% CI.

Blue whales and Northern right whales
The MFRI reported that no Blue whales and Northern right whales have been observed or reported. Northern right whales are extremely rarely seen in Icelandic waters, with the last sighting reported in 2018, the first one in a long time.

Habitat effect of the fishery - updates

[122] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017

[123] https://www.hafogvatn.is/static/extras/images/21-atlantichalibut-11206952.pdf

Bottom Trawl effort spatial extent

The ISS herring fishery does not have effects on marine habitats of any kind because the main gears used (pelagic trawl and more historically, purse seine, do not come in contact with the seabed. However, we provide here below a quick summary on seabed effects from bottom trawl fishing in Iceland and recent habitat mapping efforts.

The ICES 2020 Icelandic ecosystem overview report[124] 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 km^2 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.

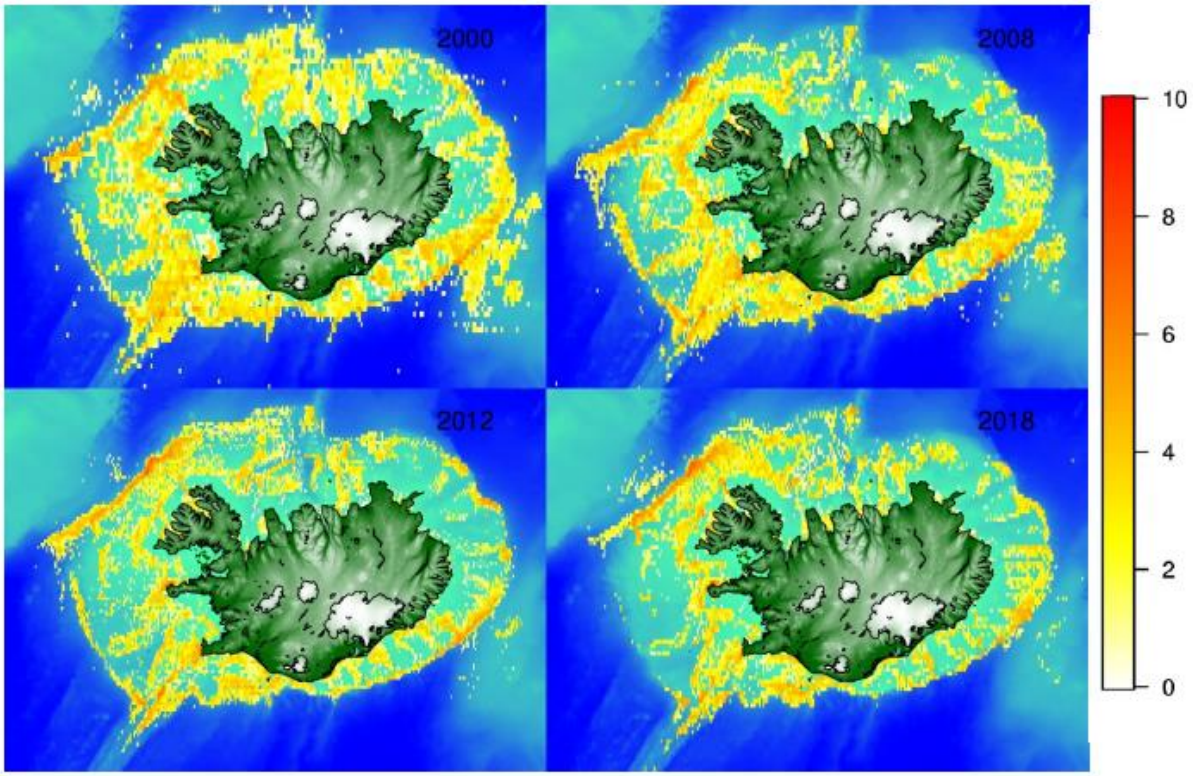

Figure 22. Spatial distribution of bottom-trawl effort (1000 kW hr) based on logbooks from trawl fishery targeting demersal fish, shrimp, and Norway lobster in 2000, 2008, 2012, and 2018.

Bottom trawling closures
Around Iceland, there are several permanent closures for bottom trawl gear, as well as many other seasonal closures for trawl and other gears. Closures act as protection from physical impacts of bottom trawl on habitats. The most recent closures are shown below.

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

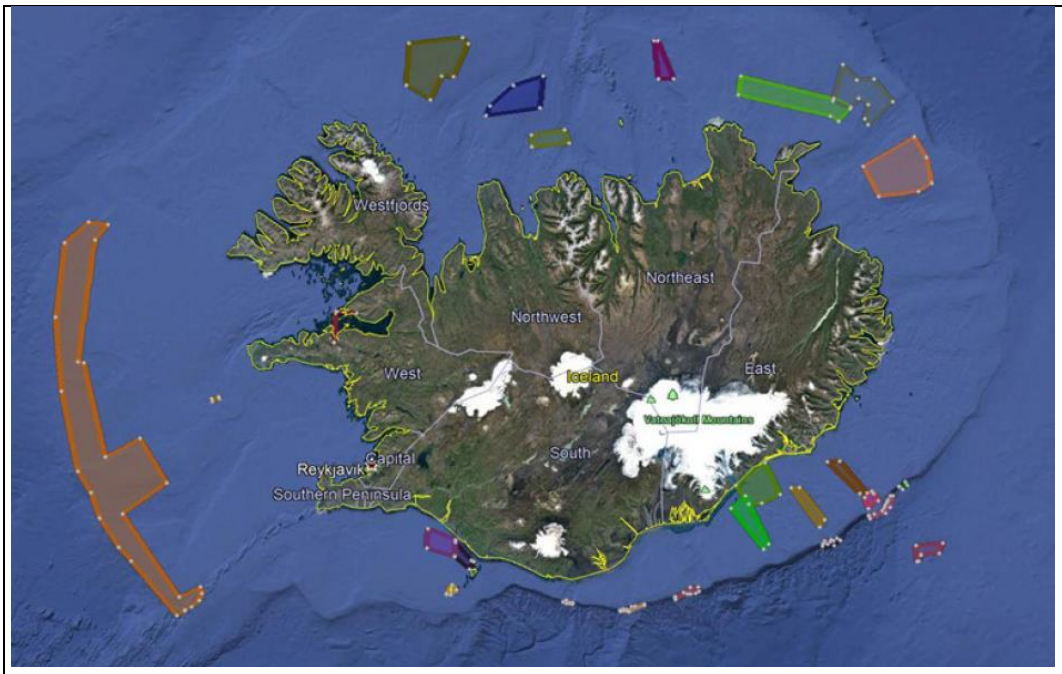

Figure 23. Permanent closures around Iceland. Source: 2020 ICES Icelandic Waters ecoregion – Fisheries overviews[125].

Habitat mapping

The MFRI communicated that some habitat mapping activities were conducted in 2019 with underwater cameras and corals were registered (report will soon be available). No new closures have been implemented.

An overview report for the first years of the habitat mapping project (2009-2012) progress is found here: https://www.hafogvatn.is/static/research/files/1608027337-hv2020-31.pdf . Also, a report on benthic by-catch in the annual groundfish survey 2015-2018 was recently published[126]. In this report the authors indicate that in 2015 the Marine and Freshwater Research Institute initiated the process of registering benthos bycatch in the annual autumn groundfish survey. The aim was to start long-term monitoring series of benthos around Iceland that could over time provide information on eventual changes in the benthic ecosystem, on biomass, species distribution and detect invasive species. The benthos is collected from the catch, identified, counted, weighted and registered. Basic information on the distribution, density and diversity of benthos in deep waters are sparse, therefore this information is very important for further research and for advisory activities relating to vulnerable species or ecosystems. Since this project started in Iceland, a total of 6,900-9,990 specimens of benthic animals have been identified annually to about 600 species. Furthermore, over 3000 photos have been taken of vast amount of these species.

The sampling and identification methods of benthos bycatch in the arctic region have been standardized as much as possible. Registering of benthic bycatch is a part of the annual ecosystem survey in the Barents Sea and these are recorded in some extent in other regions of the arctic. A joint effort to increase the recordings of benthos in the arctic was initiated in 2015. Benthic taxonomists in the arctic have participated in various surveys where the benthic bycatch has been recorded. Since 2015, the AVS fund in Iceland has supported the participation of foreign taxonomists in this process during the autumn groundfish survey. The results of these cruises are shown below.

[125] https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/FisheriesOverview_IcelandicWaters_2020.pdf
[126] https://www.hafogvatn.is/static/research/files/hv2019-41.pdf

Table 15. Total number of specimens of benthic animals in each division and their number within each subgroup within the divisions in the cruises from 2016 to 2018.

Fylking	Botndýrahópur	A11-2016	A13-2017	A12-2018
Annelida	**Liðormar**	**193**	**234**	**299**
	Polychaeta	191	232	299
	Echiura	2	2	0
Arthropoda/Crustacea/	**Liðdýr / Krabbadýr**	**436**	**1728**	**1701**
	Cirripedia	1	50	19
	Amphipoda	98	128	75
	Decapoda	104	1169	1358
	Isopoda	29	111	35
	Pycnogonida	204	275	214
Tunicata	**Möttuldýr**	**71**	**56**	**103**
Cnidaria	**Holdýr**	**1046**	**1463**	**2203**
	Actiniaria	284	312	1196
	Antipatharia	3	2	1
	Scleractinia	15	5	13
Mollusca	**Lindýr**	**401**	**381**	**368**
	Aplachophora	1	0	6
	Bivalvia	77	99	95
	Gastropoda	237	88	194
	Cephalopoda	85	184	70
	Polyplachophora	1	10	1
	Scaphopoda	0	0	2
Platyhelminthes	**Flatormar**	**1**	**0**	**0**
Nemertea	**Ranaormar**	**0**	1	**7**
Porifera	**Svampar**	**2273**	**3819**	**1467**
	Desmospongiae	2198	3783	1406
	Hexactinellida	5	9	15
	Calcarea	**0**	0	1
	ógreint	70	27	45
Sipuncula	**Sæbelgir**	**5**	**3**	**5**
Priapulida	**Bjúgormar**	**0**	**1**	**0**
Turbellaria	**Iðormar**	**2**	**0**	**0**
	Zoantharia	16	145	6
	Alcyoancea	236	333	590
	Pennatulacea	461	612	313
	Hydrozoa	31	54	84
Echinodermata	**Skrápdýr**	**2315**	**2182**	**2596**
	Asteroidea	495	699	876
	Crinoidea	444	131	218
	Echinoidea	274	281	373
	Holothuroidea	79	111	283
	Ophiuroidea	723	960	846
Hemichordata	**Kragaormar**	**1**	**0**	**0**
Brachiopoda	**Armfætlur**	**168**	**96**	**68**
Bryozoa	**Mosadýr**	**11**	**13**	**23**

Furthermore, from 2016 to 2018, a total of 49 species of corals and fungi were registered that are considered fragile or indicators for fragile ecosystems (see next table). These were stone corals, coral trees, soft corals, sea feathers and sponges. Mixed methods have been used to obtain information on these species and their distribution, from by-catches in fishing gear to special research with underwater cameras and type forecast

models. The presence of a species does not necessarily mean that there is a fragile ecosystem. Density, quantity or biomass must be assessed and often further research is needed to confirm that there are certain ecosystems in a given area.

Table 16. Corals and fungi registered during the MFRI trawl survey between 2016 and 2018.

Viðkvæm vistkerfi - búsvæði	Tegundir skráðar í haustralli
Kaldsjávarkóralrif	*Lophelia pertusa (Desmopyllum pertusum),* *Madreproa oculata* *Solenosmilia variabilis*
Kóralgarðar	**Svartkóralar** *Bathypathes* sp. *Stauropathes arctica* **Hornkóralar-kóraltré** *Acanthogorgia armata* *Acanella arbuscula* *Keratoisis* sp. *Paragorgia arborea* *Paramuricea* sp. *Radicipes* sp. **Mjúkir kóralar** *Anthomastus* sp(p). *– Heteropolypus sol* * *– Pseudoanthomastus* sp.* Blómkálskóralar: *Duva florida* *Drifa glomerata* *Pseudodrifa* cf. *groenlandicus*** *Gersemia* spp. **Blúndukórall/hydrokórall** Stylasteridae spp. **Steinkóralar** *Stephanocyanthus moseleyanus* *Stephanocyanthus nobilis*** *Flabellum alabastrum* *Javania cailleti*
Djúpsvampabreiður	*Gedoia barreeti* *Geodia macandrewi* *Geodia phlegrai* ** *Geodia parva***
	*Geodia hentscheli*** *Geodia atlantica* *Stryphynus* sp. *Steletta* spp. *Thenea* spp. Mycalidae *Rossellidae* *Pheronema carpenteri* *Phakellia* sp. Axinellidae *Polymastia* spp.
Sæfjaðrabreiður	*Anthoptilum murray* *Anthoptilum grandiflorum* *Pennatula phosphorea* *Pennatula grandis/inflata*** *Pennatula aculeata*** *Funiculina quadrangularis* *Haliptheris* sp. *Kophobelemnon* sp. Protoptilidae sp(p). *Umbellula encrinus* *Umbellula* óþekkt tegund Virgulariidae sp(p).

*these species are not on the list but a recent review of Anthomastus species shows that species analyses have been incorrect over time and therefore these species have been added to the list.
**species of the same genus that were not on the list but are found near Iceland

Records of sensitive benthic species were used in the project NovasArc – a Nordic project on vulnerable marine ecosystems and anthropogenic activities in arctic and sub - arctic waters (https://novasarc.hafogvatn.is). In the NovasArc project, distribution forecast maps were prepared for sensitive species off the Faroe Islands, eastern Greenland, Iceland and Norway. The forecast maps indicate areas that could be suitable for these species based on available information on known distribution and

environmental factors related to them (Buhl - Mortensen et al. 2019)[127]. These maps were also compared to the footprint of bottom fishing and the collision between them discussed. The project was a collaborative project of the Marine Research Institute with Havstovan in the Faroe Islands and the Institute of Marine Research in Bergen, supported by the Nordic Council of Ministers NORDEN.

The 2019 NovasArc report highlighted through a risk assessment method that within the Icelandic EEZ, overlap between the fishing effort and the optimal predicted habitat was high for several VMEs, including sublittoral sea pen communities (54.8% of their optimal habitat), hard bottom sponge aggregations (51.2%), stylasterid corals (50.5%), cold-water coral reefs (50.4%), soft bottom sponge aggregations (41.6%), and hard bottom gorgonians (42.3%). However, the authors also note that historical trawl disturbance may have decrease the amount of suitable habitat for these benthic groups.
Also, a paper was published by Burgos et. al (2020) [128]based on the findings of the Novasarc work. The group that produced this publication has received an additional funding to develop this work further including managemental aspects in 2021.

Hydrothermal vents
The MFRI communicated that a proposal for closure of the hydrothermal vent area in Steinahóll has been submitted to the Ministry of fisheries but no action has yet been taken of their behalf.

Icelandic marine ecosystem updates

The ICES 2020 Icelandic ecosystem overview report[129] list the key signals within the environment and the ecosystem, which are re-produced here below:

- The variable location of the fronts between the colder and fresher waters of Arctic origin and the warmer and more saline waters of Atlantic origin result in variable local conditions, especially on the northern part of the shelf. During the last two decades, the Atlantic water mass has been dominating, in contrast to the Arctic domination in the previous three decades.
- Zooplankton biomass on the northern shelf has fluctuated in the past, cycling on a five- to ten-year periodicity, with a period of generally low biomass from the 1960s to the 1990s.
- From the mid-2000s, Atlantic mackerel *Scomber scombrus* extended its feeding grounds from the Norwegian Sea to Icelandic Waters ecoregion, while the summer feeding grounds of capelin *Mallotus villosus* moved westwards from the Icelandic Waters into Greenland waters. Norwegian spring-spawning herring *Clupea harengus* has, since the early 2000s, reappeared at its traditional feeding grounds east and north of Iceland. These major changes in migration patterns have been linked to prey availability, oceanographic conditions, and stock density.
- Increased temperature in the lower water column on the western and northern part of the Icelandic shelf has resulted in changes in spatial distribution for a number of demersal species. Species like haddock *Melanogrammus aeglefinus*, anglerfish *Lophius piscatorius*, ling *Molva molva*, tusk *Brosme brosme*, dab *Limanda limanda*, and witch *Glyptocephalus cynoglossus* that have previously had Icelandic waters as their northern boundary of distribution and have mainly been recorded in the warm waters south and west of Iceland, are now showing a northward clockwise trend in their distribution along the shelf, and in some cases a distributional shift. Warming waters has led to a decline in the stock abundance and distribution of many cold-water species, while the previously rare occurrence of warm-water species in the ecoregion has increased in recent years.
- The stocks of northern shrimp *Pandalus borealis* collapsed around the year 2000 and the driving factors are thought to be increased predation by gadoids, increasing temperature, and high fishing mortality.

[127] http://norden.diva-portal.org/smash/get/diva2:1304079/FULLTEXT02.pdf
[128] https://www.frontiersin.org/articles/10.3389/fmars.2020.00131/full
[129] https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/EcosystemOverview_IcelandicWaters_2020.pdf

- Improved management measures for most of the major stocks (cod, haddock, saithe, redfish *Sebastes sp.,* herring) have resulted in decreased fishing mortality, close to or at FMSY, and increased SSBs. This has furthermore resulted in decrease in effort and less pressure on the benthic habitats.
- A recruitment failure of sandeel (*Ammodytidae*) was recorded in 2005 and 2006, and, with the exception of the 2007 cohort, recruitment has been at a low level since then. Fish stomach content data suggest that the decline in the sandeel population may even have started as early as around year 2000.
- The abundance of minke whales *Balaenoptera acutorostrata* has decreased on the Icelandic shelf in recent years, following changes in prey distribution. Abundance of other species, in particular fin whales *Balaenoptera physalus* and humpback whales *Megaptera novaeangliae*, have increased over the last 20 to 30 years.
- In recent decades, the breeding success of many seabird species has been poor in south and west Iceland, accompanied by declines in their breeding population sizes. These trends may be influenced by changes in density, composition, and spatial distribution of their main fish prey (i.e. sandeel).

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 2018[130] 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, although we note the stock is close to its limit reference point in 2020[131]. 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.

[130] https://www.sciencedirect.com/science/article/pii/S0165783618301620
[131] https://www.hafogvatn.is/static/extras/images/30-herring-11206946.pdf

Clause 3.2 – Specific Criteria

Clause 3.2.1 – Information gathering and advice

Supporting Clauses:	3.2.1.1, 3.2.1.2			
Important Note:	Clause 3.2.1.2 is new to IRFM Standard v2.0 and is scored separately in Appendix 2.			
Clause Guidance:	***Information shall be available on fishing gear used in the fishery, including the fishing gears' selectivity and its potential impact on the ecosystem. Stocks of non-target species commonly caught in the fisheries for the stock under consideration may be monitored and their state assessed as appropriate.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

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 recent advice, which include routine monitoring and assessment efforts is available online.

EVIDENCE

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.

Fish and mesh size regulations

The fishery of the summer-spawning herring is specifically regulated by regulations set by the Icelandic Ministry[132]. According to this regulation, the fishery of the Icelandic summer-spawning herring is limited to the period 1 September to 1 May each season. Several other regulations are enforced by the Ministry that affect the herring fishery. They involve protections of juvenile herring (27 cm and smaller) in the fishery where area closures are enforced if the proportion of juveniles exceeds 25% in number (no. 376, 8 October 1992). No such closures took place in the 2019/2020 fishing season. The minimum mesh size for herring seines is 31.4 mm, the minimum codend mesh size in pelagic trawls targeting herring is 40 mm and the minimum mesh size (stretched) for herring driftnets is 63 mm[133]. The use of sorting grids in trawls may be required in some areas, if it is felt this is necessary to avoid bycatch. Then there is a regulation that prohibits use of pelagic trawls within the 12 nautical miles fishing zone (no. 770, 8 September 2006), which is enforced to limit bycatch of juveniles of other fish species[134].

Stocks of non-target species commonly caught in the ISS herring fisheries are monitored and their state assessed as appropriate.

A comprehensive list of species is assessed as associated species catch, bycatch and ETP species interacting with the fishery under assessment (including marine mammals and seabirds) in Clause 3.1. *Please refer to the previous clause for an assessment on their status.*

132 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/21662
133 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553
134 https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf

As of 2021, the MFRI provide advice for 45 fish stocks in Iceland[135] plus additional as advice on harvest and management of different marine mammals (e.g. whales harvest, seals management, bycatch of marine mammals and seabirds).

The status of species commonly bycaught or associated with the ISS herring fishery has been assessed in clause 3.1.

Additional species/stocks monitored by the Directorate of Fisheries
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… Records for over 50 species can be retrieved on their website.[136]

[135] https://www.hafogvatn.is/en/harvesting-advice
[136] http://www.fiskistofa.is/veidar/aflastada/aflastodulisti/

Clause 3.2.2 – By-catch and discards

Supporting Clauses:	3.2.2.1, 3.2.2.2, 3.2.2.3, 3.2.2.4, 3.2.2.5			
Important Note:	Clause 3.2.2.4 and Clause 3.2.2.5 are new to IRFM Standard v2.0 and are scored separately in Appendix 2.			
Clause Guidance:	***Discarding, including discarding of catches from non-target commercial stocks, is prohibited. Where relevant, appropriate steps shall be taken to avoid, minimize or mitigate encounters with seabirds and marine mammals. Accordingly, non-target catches, including discards, of stocks other than the "stock under consideration" should not threaten these non-target stocks with serious risk of extinction; if serious risks of extinction arise, effective remedial action shall be taken.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

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. Discarding violations are subject to penalty ranging from ISK 400K to 8M. Non-target catches, including discards, of pelagic stocks associated with the ISS herring fishery do not threaten these non-target stocks with serious risk of extinction or comparable irreversible risks. Most of these stocks are actively managed by the MFRI. Key bycatch risks relate to seabird bycatch in longline gear and gillnets, and marine mammal bycatch in gillnets, and not with pelagic trawl gear.

EVIDENCE

Discards

Since 1996, discarding in Icelandic fisheries is prohibited and subject to penalty[137] (400K to 8M ISK).

- According to section 2 of Act no. 57/1996, concerning the treatment of commercial marine stocks, discard of catches is prohibited
- Minor exceptions:
  - (1) Non-value catches (e.g. starfish, jellyfish etc..)
  - (2) Heads and other refuse from working or processing

In a practical sense, if vessels do not have sufficient quota to cover the species they have caught they are required to attain quota through the quota transfer system. Consequently, if vessels do not have sufficient catch quotas for their probable catches they must suspend all fishing activities; this means that under the ITQ system, the discard policy primarily affects the composition of landings and not the aggregate volume[138].

We note however that discards in the ISS herring fishery are considered negligible[139], and none were reported in 2019/2020 by the MFRI technical report on the species[140].

[137] Act concerning the Treatment of Commercial Marine Stocks No. 57-1996: https://www.althingi.is/altext/pdf/131/s/0982.pdf

[138] http://www.nwwac.org/_fileupload/Image/Iceland%20fisheries%20directorate%202007%20presentation%20re%20discards%20to%20EU%20delegation.ppt

[139] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/her.27.5a.pdf

[140] https://www.hafogvatn.is/static/extras/images/sild2020-tr1206968.pdf

One feature of this ban is that it has some inbuilt flexibility. Article 9 Regulation no. 698/2012 on fishing for commercial fishing year 2012/2013 states that:
"The master may decide that part of the catch is not calculated on the vessel's catch quota. This authorization is limited to 0.5% of pelagic catch and 5% of other catches by the relevant vessels during the fishing year and is subject to the following conditions:
a. The catch is kept separately from the other catch of the ship and it is weighed and registered separately.
b. The catch is sold at auction in an approved auction market for seafood, and its proceeds flow to the Fisheries Fund, cf. law no. 37/1992, with subsequent amendments.
c. The license is divided into four three-month periods during the fishing year. Unused sources may not be transferred between the periods[141].

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. However, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, and preventing discard.

Associated catches and bycatch
Non-target catches, including discards, of stocks associated to the pelagic ISS herring fishery do not threaten these non-target stocks with serious risk of extinction or comparable irreversible risks. Most of these stocks are abundant pelagic stocks actively managed by the MFRI. An update on these species has been provided under clause 3.1. Please refer to that analysis for details.

Main bycatch issues in Iceland stem from the use of gillnet and longline gear and there are measures taken in this regard.

Longline. There are technical measures/mechanisms in place in Icelandic longliners to mitigate adverse impacts on seabirds. These include the use of acoustic cannons, balloons towed at the end of the vessel to scare-off diving birds, and night settings to minimise interactions with seabirds. Setting longlines at night (between the end of nautical twilight and before nautical dawn) is effective at reducing incidental mortality of seabirds because the majority of vulnerable seabirds are diurnal foragers. The Directorate also highlighted, during the site visits, that laser lights are being used widely as a deterrent.

Gillnet. Acoustic porpoise deterrents (pingers) were tested for the first time in the Icelandic cod gillnet fishery in April of 2017, but their use showed no reduction in porpoise bycatch, as 7 porpoises got caught in nets with pingers, while 5 porpoises got caught in control nets nearby. Another type of porpoise deterrents (PALs) were tested in the cod gillnet fishery in April of 2018 and like the pingers, showed no reduction in porpoise bycatch as 12 porpoises were caught in nets with the devices, while 11 porpoises got caught in the control nets. Almost all the bycaught porpoises in the PAL sets (eleven out of twelve) were large adult males, while the gender ratio was six males and five females in the control sets. Interestingly, eight of the twelve porpoises caught in the PAL sets were found right by the PAL device, suggesting possible attraction of adult males towards the PAL devices[142]. Further trials with pingers were done in April 2019[143]. The MFRI also highlighted in 2021, during the remote audit, that they were trying different pinger frequencies and some of them of these appeared to be better than older one tried in previous years.

[141] http://www.fiskistofa.is/veidar/aflastada/vs-afli/vsafli.jsp
[142] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/HAPISG/2019/ICES%20WGBYC%20Report%202019.pdf
[143] https://nammco.no/wp-content/uploads/2019/04/2018-iceland_progress_report_final2.pdf

Several of the species listed on the OSPAR list of threatened and declining species are known bycatch species in Icelandic fisheries. These species are leafscale gulper shark, basking shark, porbeagle, spiny dogfish, and common skate. Landings of these species are small or incidental for bottom trawl and longline gear. Furthermore, virtually no catches of any of these stocks have been recorded in pelagic trawl gear in the past 5 years based on Fiskistofa records[144].

Suitable steps are considered to avoid, minimize or mitigate encounters with endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification. Most of these steps include the ban on direct harvest. For a number of sharks and rays, other marine mammal and seabird species, the take is not considered to be significant and as such, specific steps to mitigate encounters with endangered, threatened and protected species may not strictly be necessary. Detailed information has been provided under clause 3.1, including information on seabirds and marine mammals listed in the Icelandic INH Red list[145]. No further bycatch updates were reported in the 2020 NAMMCO bycatch working group report regarding coverage or bycatch in pelagic trawl, although the MFRI mentioned that data from bottom trawl gear was available and would be presented at the next meeting[146].

Gear loss and marking

There are a number of initiatives and regulations in place to avoid the loss of fishing gear and subsequent ghost fishing of lost and abandoned gear. Where the Fishing Directorate finds and recovers lost or abandoned gear they recover the cost of recovery from the gears' owner. The Coastguard also reports any buoys it feels might represent lost or abandoned fishing gear to the Directorate. All regulations relating to fishing gear may be found in the various Articles of Fisheries Management 2020/2021 Laws and regulations[147]. During the November 2018 site visits and the current remote audit in 2021, the directorate confirmed that gear loss (e.g. longlines, gillnets) and as such ghost fishing is not considered an issue in Iceland, in part because of the ITQ system, and that reporting lost gear is compulsory. Another important factor that contributes to low levels of lost fishing gear is the high price of that gear. This means that fishers are careful to avoid losing their gear. In the case of trawls the majority of vessels carry special grapples onboard that allow them to retrieve lost gear even when both towing warps have parted, which is a rare situation. The Icelandic ITQ system allows for a slower paced fishery than would be expected if there was only an overall TAC with all boats fishing against it. The system allows fishers to target their efforts in optimum weather conditions leading to decreased rates of lost fishing gear.

[144] http://www.fiskistofa.is/veidar/aflaupplysingar/bradabirgdatolur/
[145] https://en.ni.is/node/27837
[146] https://nammco.no/wp-content/uploads/2017/01/report_bycwg_2020.pdf
[147] https://vefbirting.prentmetoddi.is/raduneyti/stjorn_fiskveida_2020-21/94/

Clause 3.2.3 – Habitat Considerations

Supporting Clauses:	3.2.3.1, 3.2.3.2, 3.2.3.3, 3.2.3.4			
Important Note:	No changes to Clauses in IRFM Standard v2.0.			
Clause Guidance:	***If studies show that the spawning or nursery areas or other essential habitats in the fishing area are at risk and highly vulnerable to negative impacts of particular fishing gear, such impacts shall be limited in range relative to the full spatial range of the habitat or else action is taken to avoid, minimise or mitigate such impacts. Management measures must take into account and protect through closures significant continuous stony coral areas, identified through scientific and formal methods. Known thermal vents shall be protected through area closures to fishing activities with gear that has significant bottom impact during normal operation.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The ISS herring fishery does not have effects on marine habitats of any kind because the main gears used (pelagic trawl) and historically, purse seine, do not come in contact with the seabed. Closures exist around Iceland to protect again bottom trawl gear which is considered the gear with most negative habitat effects.

EVIDENCE

The ISS herring fishery does not have effects on marine habitats of any kind because the main gears used (pelagic trawl) and historically, purse seine, do not come in contact with the seabed. However, we provide here below a quick summary on seabed effects from bottom trawl fishing in Iceland and recent habitat mapping efforts.

Bottom Trawl effort spatial extent

The ICES 2020 Icelandic ecosystem overview report[148] 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 km^2 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.

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

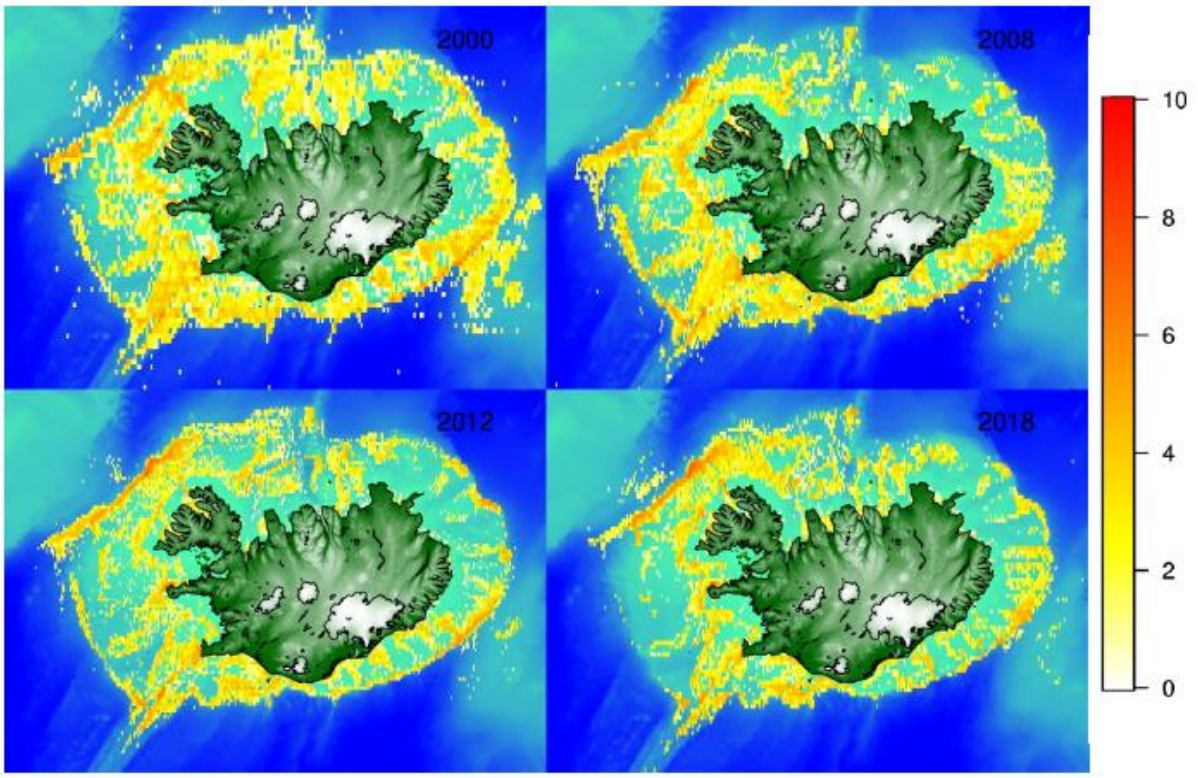

Figure 24. Spatial distribution of bottom-trawl effort (1000 kW hr) based on logbooks from trawl fishery targeting demersal fish, shrimp, and Norway lobster in 2000, 2008, 2012, and 2018.

Bottom trawling closures

Around Iceland, there are several permanent closures for bottom trawl gear, as well as many other seasonal closures for trawl and other gears. Closures act as protection from physical impacts of bottom trawl on habitats. The most recent closures are shown below.

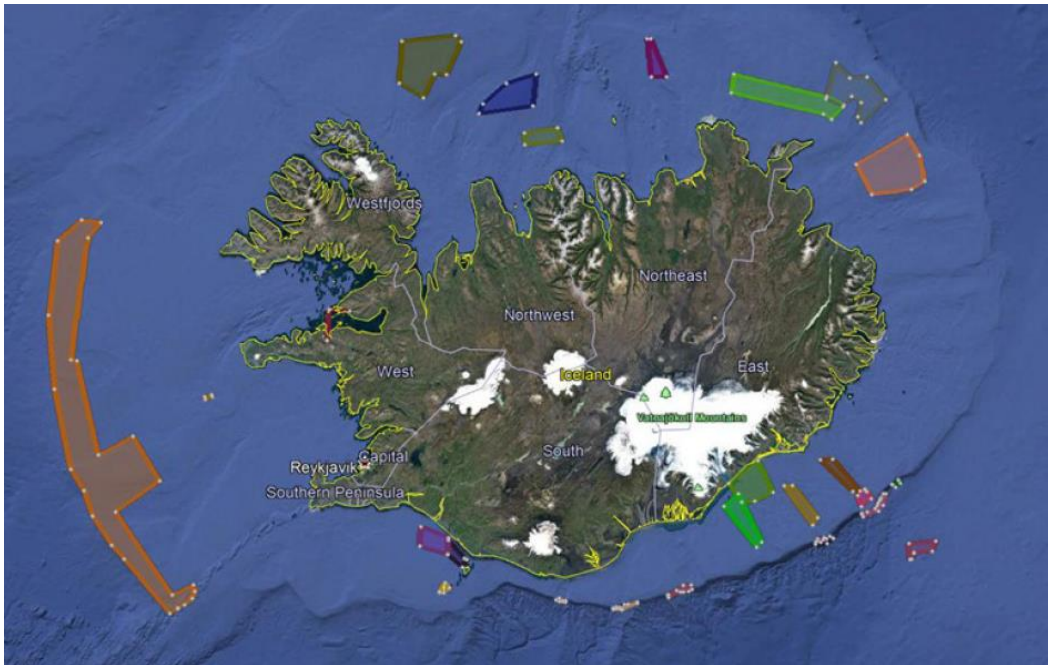

Figure 25. Permanent closures around Iceland. Source: 2020 ICES Icelandic Waters ecoregion – Fisheries overviews[149].

[149] https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/FisheriesOverview_IcelandicWaters_2020.pdf

Habitat mapping

The MFRI communicated that some habitat mapping activities were conducted in 2019 with underwater cameras and corals were registered (report will soon be available). No new closures have been implemented.

An overview report for the first years of the habitat mapping project (2009-2012) progress is found here: https://www.hafogvatn.is/static/research/files/1608027337-hv2020-31.pdf . Also, a report on benthic by-catch in the annual groundfish survey 2015-2018 was recently published[150]. In this report the authors indicate that in 2015 the Marine and Freshwater Research Institute initiated the process of registering benthos bycatch in the annual autumn groundfish survey. The aim was to start long-term monitoring series of benthos around Iceland that could over time provide information on eventual changes in the benthic ecosystem, on biomass, species distribution and detect invasive species. The benthos is collected from the catch, identified, counted, weighted and registered. Basic information on the distribution, density and diversity of benthos in deep waters are sparse, therefore this information is very important for further research and for advisory activities relating to vulnerable species or ecosystems. Since this project started in Iceland, a total of 6,900-9,990 specimens of benthic animals have been identified annually to about 600 species. Furthermore, over 3000 photos have been taken of vast amount of these species.
The sampling and identification methods of benthos bycatch in the arctic region have been standardized as much as possible. Registering of benthic bycatch is a part of the annual ecosystem survey in the Barents Sea and these are recorded in some extent in other regions of the arctic. A joint effort to increase the recordings of benthos in the arctic was initiated in 2015. Benthic taxonomists in the arctic have participated in various surveys where the benthic bycatch has been recorded. Since 2015, the AVS fund in Iceland has supported the participation of foreign taxonomists in this process during the autumn groundfish survey.

Records of sensitive benthic species were used in the project NovasArc – a Nordic project on vulnerable marine ecosystems and anthropogenic activities in arctic and sub - arctic waters (https://novasarc.hafogvatn.is). In the NovasArc project, distribution forecast maps were prepared for sensitive species off the Faroe Islands, eastern Greenland, Iceland and Norway. The forecast maps indicate areas that could be suitable for these species based on available information on known distribution and environmental factors related to them (Buhl - Mortensen et al. 2019)[151]. These maps were also compared to the footprint of bottom fishing and the collision between them discussed. The project was a collaborative project of the Marine Research Institute with Havstovan in the Faroe Islands and the Institute of Marine Research in Bergen, supported by the Nordic Council of Ministers NORDEN.

The 2019 NovasArc report highlighted through a risk assessment method that within the Icelandic EEZ, overlap between the fishing effort and the optimal predicted habitat was high for several VMEs, including sublittoral sea pen communities (54.8% of their optimal habitat), hard bottom sponge aggregations (51.2%), stylasterid corals (50.5%), cold-water coral reefs (50.4%), soft bottom sponge aggregations (41.6%), and hard bottom gorgonians (42.3%). However, the authors also note that historical trawl disturbance may have decrease the amount of suitable habitat for these benthic groups.
Also, a paper was published by Burgos et. al (2020) [152]based on the findings of the Novasarc work. The group that produced this publication has received an additional funding to develop this work further including managemental aspects in 2021.

Hydrothermal vents

The MFRI communicated that a proposal for closure of the hydrothermal vent area in Steinahóll has been submitted to the Ministry of fisheries but no action has yet been taken of their behalf.

[150] https://www.hafogvatn.is/static/research/files/hv2019-41.pdf

[151] http://norden.diva-portal.org/smash/get/diva2:1304079/FULLTEXT02.pdf

[152] https://www.frontiersin.org/articles/10.3389/fmars.2020.00131/full

Clause 3.2.4 – Foodweb Considerations

Supporting Clauses:	3.2.4.1			
Important Note:	Old Clause "3.2.4 Considerations" has been split into "3.2.4 Foodweb Considerations" and "3.2.5 Precautionary Considerations" in IRFM Standard v2.0 – Clause 3.2.4 Foodweb Considerations addressed separately here.			
Clause Guidance:	***If the stock under consideration is a key prey species in the ecosystem, the harvesting policy and management measures shall be directed to avoid severe adverse impacts on dependent predators.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

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. 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, although we note the stock is close to its limit reference point in 2020.

EVIDENCE

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[153] 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, although we note the stock is close to its limit reference point in 2020[154].

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.

[153] https://www.sciencedirect.com/science/article/pii/S0165783618301620
[154] https://www.hafogvatn.is/static/extras/images/30-herring-11206946.pdf

Clause 3.2.5 – Precautionary Considerations

Supporting Clauses:	3.2.5.1			
Important Note:	Old Clause "3.2.4 Considerations" has been split into "3.2.4 Foodweb Considerations" and "3.2.5 Precautionary Considerations" in IRFM Standard v2.0 – Clause 3.2.5 Precautionary Considerations addressed separately here. Clause 3.2.5.1: Text added (**Bold**) in IRFM Standard v2.0: "*Management plans shall be developed and implemented in a timely fashion for avoiding, minimizing or mitigating any ecosystem issues properly identified. These shall be based on risk analysis and scientific advice,* ***consistent with the precautionary approach,*** *as being of serious concern in the fishery in question."* Clause 3.2.5.1 (minor change) – consistency with precautionary approach specifically addressed below.			
Clause Guidance:	***Management plans shall be developed and implemented in a timely fashion for avoiding, minimizing or mitigating any ecosystem issues properly identified. These shall be based on risk analysis and scientific advice, consistent with the precautionary approach, as being of serious concern in the fishery in question.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The most probable adverse impacts of the Icelandic fisheries are considered and those impacts likely to have serious consequences are addressed. Consideration of the adverse impacts of the fishery on the ecosystem and resulting management actions are demonstrably consistent with the precautionary approach outlined in the IRFF Standard.

EVIDENCE

Icelandic government policy aims to protect vulnerable marine ecosystems from significant adverse impact from bottom contacting gear and legislation exists to provide for the prohibition of fishing activities with bottom-contacting gear in areas where vulnerable ecosystems occur. MFRI Advice includes a specific section on the ecosystem impacts of Icelandic fisheries[155]. The document identifies the major regional pressures for the ecoregion (Figure below).

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

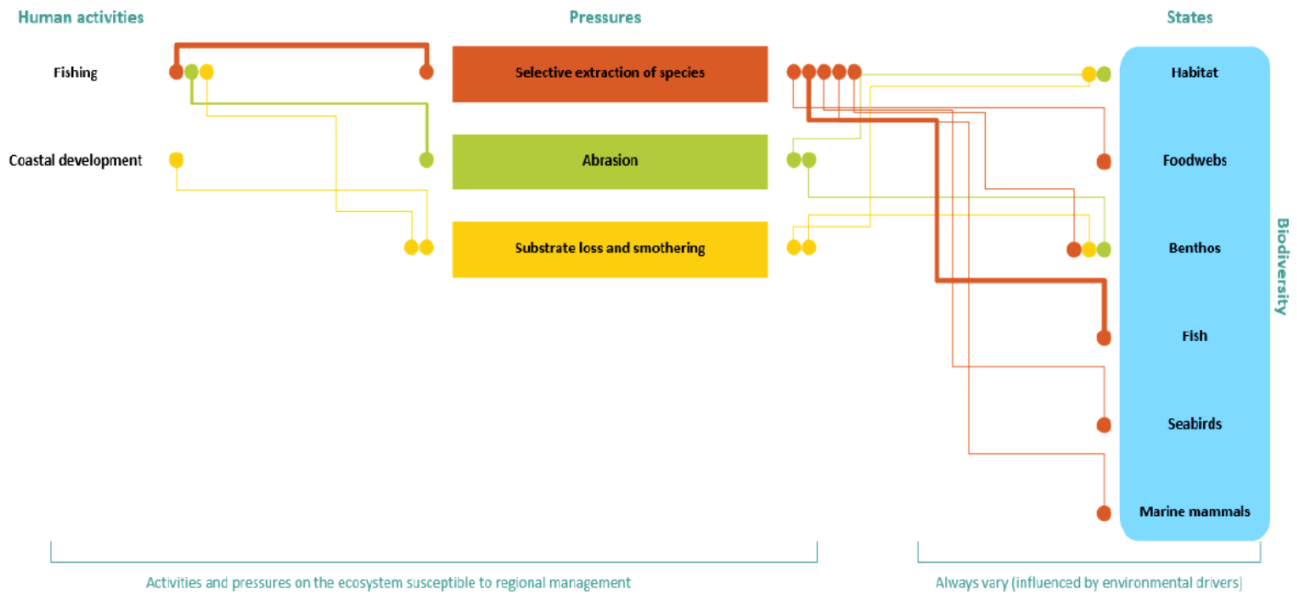

Figure 26. Icelandic Waters ecoregion overview with the major regional pressures, human activities, and state of the ecosystem components. The width of lines indicates the relative importance of individual links (the scaled strength of pressures should be understood as a relevant strength between the human activities listed and not as an assessment of the actual pressure on the ecosystem).

Measures to minimize or mitigate ecosystem issues identified include technical measures such as the use of night settings, trailing balloons, scare lines and weighted lines in longline fisheries, the trial of bycatch reduction devices in gillnet fisheries, the use of flying pelagic doors[156] and rock hoppers on bottom trawlers, and real time, temporary and permanent areal closures (see clause 3.2.3.1 for details), and, where appropriate, the specific consideration of predation in some stock assessments as is the case in the assessment of capelin which considers the cod-capelin predator-prey relationship. In the case of ISS herring, the current management plan and harvest control rule are designed to avoid recruitment overfishing in the fishery and this has been tested through modelling, although we note that the stock is close to its biomass limit reference point, and further revisions to this plan/HCR may be further required at the next plan revision (planned for 2022).

The Fisheries Management Plan for Icelandic ISS herring summarizes the measure in place relevant to ecosystem effects as follows. The fisheries are managed by a catch quota system. The annual quota is allocated to individual vessels or vessel groups so that the sum of quotas for individual vessels and vessel groups equals the TAC according to the HCR. Within the system there are various measures to make the fisheries economically viable, together with measures to coordinate catch composition and the TAC and to reduce discard, which is prohibited by law. The use of bottom trawl and pelagic trawl is not permitted inside 12 nm along the northern coast of Iceland. Similar restrictions are implemented elsewhere based on engine size and size of vessels. In many areas special rules regarding fishing gear apply such as mandatory use of a sorting grid when fishing for shrimp to avoid juveniles and small fish or bycatch grids when fishing for pelagic species in certain areas. Overall, these management measures are designed to ensure the Icelandic marine ecosystem remains healthy and productive and to allow for the future conservation and sustainable harvest of fish stocks (Icelandic ISS Herring FMP[157]).

[156] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/
[157] https://www.government.is/news/article/2018/05/15/Haddock/

8 Performance specific to agreed corrective action plans

During the full assessment audit[158] 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 1st Surveillance is shown below. No new non-conformances were identified during the 1st 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 sea-birds 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:	The recording of marine mammals and seabirds by number and species is required by Icelandic regulation[159]. 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 *et al.* 2015[160] and the March 2018 MFRI report titled: "Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017". Pallson *et al.* 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. 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 2017[161]. Furthermore according to a 2017 presentation to NAMMCO's Working group on bycatch of marine mammals; *"logbooks have unfortunately proven unreliable"* and *"bycatch of birds and marine mammals is 18x higher when observer is present vs logbook records"*. 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.

[158] https://www.responsiblefisheries.is/media/1/form-11.2-iceher-initial-assessment-final-report-and-determination.pdf
[159] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967
[160] https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf
[161] https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

Corrective Action Plan	In accordance with rules of the IRF Programme, the Client is required to submit a Corrective Action Plan (CAP) within 28 days. **The Client submitted the following CAP in February 2019**

To whom it may concern

ATVINNUVEGA-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).

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:

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;

<table>
<tr><td></td><td>Year 3: Fully implement and report on progress;
Year 4: Continued implementation and reporting.</td></tr>
<tr><td>Assessment Team CAP response</td><td>The Assessment Team has accepted the Corrective Action Plan provided by the Client for the fishery under assessment.</td></tr>
<tr><td>Progress at 1st Surveillance (2021)</td><td>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 298/2020[162]. The App was designed and trialled between 2018 and 2020. The App also called Afladagbókina or catch diary[163] [164]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.

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).

Bycatch of marine mammals and seabirds by gear type in 2016-2019 as reported by the fishing fleet. Source MFRI, January 2021.
<table>
<tr><th colspan="6">Cod and Greenland halibut gillnets</th></tr>
<tr><td>Species</td><td>2016</td><td>2017</td><td>2018</td><td>2019</td><td>Total</td></tr>
<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>
<tr><td>Grey seal</td><td>4</td><td>1</td><td>1</td><td>1</td><td>7</td></tr>
<tr><td>Harp seal</td><td>2</td><td>0</td><td>0</td><td>0</td><td>2</td></tr>
<tr><td>Ringed seal</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>Humpback whale</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>Northern bottlenose whale</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>Risso’s dolphin</td><td>0</td><td>0</td><td>7</td><td>0</td><td>7</td></tr>
<tr><td>Total marine mammals</td><td>71</td><td>58</td><td>64</td><td>37</td><td>230</td></tr>
<tr><td>Common guillemot</td><td>32</td><td>40</td><td>35</td><td>38</td><td>145</td></tr>
<tr><td>Northern fulmar</td><td>0</td><td>2</td><td>0</td><td>0</td><td>2</td></tr>
<tr><td>Brünnich‘s guillemot</td><td>0</td><td>0</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>Black guillemot</td><td>0</td><td>2</td><td>0</td><td>26</td><td>28</td></tr>
</table>
</td></tr>
</table>

[162] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887
[163] http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla
[164] https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

	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 1st Surveillance (2021) Corrective Evidence	**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.** **The 2nd surveillance activities will review evidence that the corrective actions highlighted above have been carried out.**

The Assessment Team has also issued a formal Recommendation for the client to consider.

Recommendations

Recommendation 1 relevant to clause 1.3.1.2.
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.

It is noted that the issues highlighted in these recommendations will be reviewed in subsequent surveillance audits, and that some of these have the potential to develop into non-conformances if the issues worsen.

9 Unclosed, new non-conformances and new corrective action plans

There are no new non-conformances or corrective actions assigned as part of this audit.

10 Future Surveillance Actions

Future surveillance actions are detailed below.

Table 17. Key future surveillance actions.

Clause No.	Surveillance Action
2.3.2.4	**The 2nd surveillance activities will review evidence that the corrective actions are being carried out in a timely manner. This will consist of up to date information on the implementation of the new App/catch diary deployed in September 2020 in the small boat sector, and bycatch data recorded in such system.**

11 Client signed acceptance of the action plan

Not applicable, but see Section 8 for the existing action plans.

12 Recommendation and Determination

The assessment team recommends that the management system of the applicant fishery, the Icelandic summer spawning (ISS) herring commercial fishery under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls, and indirectly by gears from other Icelandic fisheries legally landing herring within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), is granted continued certification.

Accordingly, continued certification is granted.

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8 Appendix 1. Assessment Team

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification is pleased to confirm the Surveillance Assessment team members for the fishery 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 (now NSF International/Global Trust Certification) 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 has recently retired from the Institute of Marine Research (IMR), Bergen, 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 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 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.

Appendix 2 – New Clauses in ICE RFM Standard v2.0

15.1. Clause 1.1.5

Clause 1.1.5	Transparency in the fisheries management and related decision-making process shall be ensured.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Management arrangements and decision-making processes are organized in such a way so as to ensure transparency.

EVIDENCE

Icelandic fisheries management arrangements and decision-making processes are organized in a very transparent manner. The roles, functions and responsibilities of the Ministry of Fisheries and Agriculture, Directorate of Fisheries, Coastguard and MFRI are all set out clearly on their respective websites. Additionally, Iceland's small population ensures short chains of communication that in turn ensure that key issues affecting the fishing community are well understood by all affected parties. The Minister is required by legislation to consult the MFRI before the setting of TAC. There is a consultation forum of utilised fish stock that has the aim of discussing current strategy and harvesting based on MRI's advice and propose necessary changes. Scientific evaluations, including stock assessment and scientific advice are published online on ICES and MFRI[165] websites once they are ready. There are regular meetings between fishery managers and industry representatives, at the individual level, committees, seminars and conferences where all aspects of fisheries management are discussed. Industry are well represented by a number of industry bodies such NASBO[166] and Fisheries Iceland[167].

Information on the catch quota of each vessel for each fish species, including quota transfers between vessels, and remaining quota for the season for each vessel is recorded in the official central database. The publicly accessible nature of information relating to ownership of quota ensures transparency and accountability within the management system. Finally, where disputes arise that necessitate legal intervention these are reviewed in public through the Icelandic civil law legal system, including its district and supreme courts, and all findings are published on the internet.

It is the determination of the Assessment Team that management arrangements and decision-making processes are organized in such a way that transparency is ensured; therefore the Icelandic ISS herring fisheries are in full compliance with Clause 1.1.5 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

Non-Conformance Number (if relevant)	**NA**

165 https://www.hafogvatn.is/en/harvesting-advice

166 http://smabatar.is/sida/7.shtml

167 http://www.sfs.is/

15.2 Clause 1.1.6

Clause 1.1.6	Fisheries shall be regulated in such a way as to avoid the risk of conflict among fishers using different vessels gear and fishing methods. Where conflict arises appropriate venues and means shall be available for conflict resolution.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Fisheries are regulated in such a way as to avoid the risk of conflict among fishers using different vessels gear and fishing methods. Where conflict arises appropriate legal venues and means are available for conflict resolution.

EVIDENCE

Vessels fishing using longline gear use lights and AIS transmitters on their buoys. These serve to make the location of set longlines more visible to other fleet sectors such as bottom trawlers thereby reducing gear conflict. There also strict rules on the marking of gillnets, pots and traps (see supporting evidence for Clause 2.3.2.17). Other measures such as spatial separation of fishing activities including the exclusion of bottom trawlers from fishing within 12nm of the coast further reduce the changes of conflicts between fleet sectors arising.

Iceland's small population and relatively small fishing community ensures short chains of communication that ensure conflicts can generally be resolved before they arise. There are regular meetings between fishery managers and industry representatives where all aspects of fisheries are discussed.

The Icelandic civil law legal system has strong foundations and long tradition. Its district courts and the supreme court deals with all disputes that arise within the system. Disputes are reviewed in public and all findings are published on the internet.

It is the determination of the Assessment Team that fisheries are regulated in such a way as to avoid the risk of conflict among fishers using different vessels gear and fishing methods and that where conflicts do arise appropriate venues and means are available for conflict resolution; therefore the Icelandic ISS herring fisheries are in full compliance with Clause 1.1.6 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

Non-Conformance Number (if relevant)	NA

15.3 Clause 2.1.2

Clause 2.1.2	Laws and regulations concerning conservation and management measures shall be publicly available and effectively disseminated.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Laws and regulations concerning conservation and management measures are publicly available on the Directorate of Fisheries and Ministry of Industries and Innovation websites and are effectively disseminated through an online law gazette and via radio.

EVIDENCE

Laws and regulations concerning conservation and management measures are publicly available on the Directorate of Fisheries[168] and Ministry of Industries and Innovation[169] websites. The latest 2020 fishing laws are made available in a booklet form by the Icelandic authorities and effectively disseminated through an online law gazette[170] and via radio.

Furthermore, Icelandic Acts, laws and regulations are readily accessible at the official gazette https://www.stjornartidindi.is/ or at http://www.althingi.is/lagasafn/ (for Acts/Laws) or https://www.reglugerd.is/ (for Regulations). Further information on access to Icelandic Acts and Regulations is available here[171].

Additionally all advice to managers relating to the status of commercial stocks which underpins decisions on TACs and other regulations is available[172]. Harvest control rules are scrutinised on request by an independent scientific body (ICES) with reports being published online.

It is the determination of the Assessment Team that laws and regulations concerning conservation and management measures are publicly available and effectively disseminated; therefore the Icelandic herring fisheries are in full compliance with Clause 2.1.2 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

Non-Conformance Number (if relevant)	**NA**

[168] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/
[169] https://www.government.is/ministries/ministry-of-industries-and-innovation/
[170] https://vefbirting.prentmetoddi.is/raduneyti/stjorn_fiskveida_2020-21/94/
[171] https://www.stjornarradid.is/gogn/log-og-reglugerdir/
[172] https://www.hafogvatn.is/en/harvesting-advice

15.4 Clause 2.3.2.17

Clause 2.3.2.17	In cases of passive fishing gear left unattended at sea, there shall be regulation that requires fishing gear to be marked so that the owner can be identified, where relevant.[173]			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE
According to IRFF Standard Revision 2.0: *"This clause is applicable to gillnets, traps and pots."*
In cases of gillnets, traps and pots left unattended at sea, there are regulations requiring that they are marked so that the owner can be identified.

EVIDENCE
In Iceland there are specific gear marking regulations for anchored bottom set nets targeting cod. We also note that catch of ISS herring by gillnets is very small and there has been almost none in the past 5 years. These provisions are contained in Regulation No. 115 of 13 February 2006[174]. Article 4 states that all anchors for set nets must be marked with the district registration and number of the boat. Buoys must be fixed at both ends of the nets and buoys must be marked clearly with district registrations and the number of the boat. Article 5 states that the buoy attached at the west end of the nets must be marked with a net-ring (a floating ring approximately 20 cm in diameter). If nets are set in an area where bottom trawling also occurs the west end buoy must be marked with one white blinking light.

Other regulations with specific requirements for gear marking include:

- 202/2016, Lumpfish-fishing (Articles 7 and 11)[175]
- 1012/2013, on fishing whelk in traps (Paragraph 5)[176]
- 1070/2015 the fishing of crabs in the inner Faxaflói (Paragraph 4)[177]
- 923/2010, Monkfish-fishing (Paragraph 4)[178]
- 449/2013 Regulation of equipment and nets fishing for trout (Paragraph 6)[179]

Note: Acts/Laws and Regulations referenced herein may be accessed (in Icelandic) by searching by Act/Law/Regulation No./Year (e.g. 116/2006) at the official gazette https://www.stjornartidindi.is/ (Acts/Laws and Regulations) or at http://www.althingi.is/lagasafn/ (for Acts/Laws) or https://www.reglugerd.is/ (for Regulations). The latest regulation for 2020-2021 are available at https://vefbirting.prentmetoddi.is/raduneyti/stjorn_fiskveida_2020-21/94/.

It is the determination of the Assessment Team that in cases of gillnets, traps and pots left unattended at sea, there are regulations requiring that they are marked so that the owner can be identified; therefore the Icelandic ISS herring fisheries are in full compliance with Clause 2.3.2.17 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

Non-Conformance Number (if relevant)	NA

[173] This clause is applicable to gillnets, traps and pots.
[174] http://www.reglugerd.is/reglugerdir/allar/nr/115-2006
[175] http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/20032
[176] https://www.stjornartidindi.is/Advert.aspx?RecordID=024102ac-de04-45ce-99e3-5e83af6d6aae
[177] http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/19883
[178] https://www.stjornartidindi.is/Advert.aspx?RecordID=437308e0-8ad1-4009-98cb-10266317ed3e
[179] http://www.reglugerd.is/reglugerdir/allar/nr/449-2013

15.5 Clause 3.2.1.2

Clause 3.2.1.2	Information shall be available on the potential effect of fishing on endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The IRFF Standard Revision 2.0 defines endangered, threatened and protected species (ETPs) as: ***"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."***

Other species which might be considered vulnerable such as marine mammal and seabird species are considered under Clause 3.1.

Information is available on the potential effect of the ISS herring fishery on species designated as ETPs. The current status of most ETPs species is assessed routinely and presented in the MRI advice reports.

EVIDENCE

In the context of the IRFF Standard Revision 2.0 endangered, threatened and protected species (ETPs) are those species recognised by Icelandic legislation and/or binding international agreements to which the Icelandic authorities are party and binding international agreements as applicable in Icelandic jurisdiction.

As discussed previously, discarding of fish species is prohibited and there is a statutory requirement for skippers to record both the capture of fish and non-fish species such as seabirds and marine mammals. The e-logbook system as well as paper logbooks for smaller vessels include provisions for such information to be recorded. Observations are also recorded by Directorate fishery inspectors aboard fishing vessels and during bottom trawl, gillnet and longline surveys undertaken by the MFRI.

Vulnerable and ETP species Interactions

According to the Convention for the Protection of the Marine Environment of the North-East Atlantic or OSPAR Convention, as reported in the 2020 ICES Ecosystem report of the Icelandic Ecoregion[180] there are a number of threatened and declining species in Iceland. Interactions with ETP and vulnerable species are generally limited, updates of which have been reported in clause 3.1.

It is the determination of the Assessment Team that sufficient information is available to allow the potential effects of the ISS herring fishery on species designated as ETPs to be determined; therefore the Icelandic ISS herring fisheries are in full compliance with Clause 3.2.1.2 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

Non-Conformance Number (if relevant)	NA

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

15.6 Clause 3.2.2.4

Clause 3.2.2.4	Suitable steps shall be considered to avoid, minimize or mitigate encounters with endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The IRFF Standard Revision 2.0 defines endangered, threatened and protected species (ETPs) as: ***"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."***

Suitable steps are considered to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of the Icelandic ISS herring commercial fisheries. Examples of mitigation measures include the ban on directed fishing for Atlantic halibut, spiny dogfish, Porbeagle sharks and Basking shark and the creation of permanently closed areas to protect known occurrences of vulnerable cold water corals (*Lophelia pertusa*).

EVIDENCE

Interactions with ETP and vulnerable species are generally limited, these have been assessed and reported in detail in the previous clause as well as clause 3.1. Recording of all marine mammals and seabirds in E-logbooks (by species and numbers) interactions/catches is a legal requirement since 2014 (Reg. 126/2014) [181]. A smartphone app has been developed and deployed in September 2020 by the Directorate of Fisheries, which aims to prioritise and make both reporting and identification of bycatch easier for small boat operators (e.g. gillnetters) in the fishery.

Measures to minimize or mitigate ETP species interactions include the use of night settings, trailing balloons, scare lines and weighted lines in longline fisheries, recent trials of bycatch reduction devices in gillnet fisheries (e.g. banana pingers), the use of T90 nets, flying doors and rock hoppers on bottom trawlers to avoid habitat damage and impact on sensitive benthic biota such as corals, and real time, temporary and permanent areal closures (see clause 3.2.3 for details).

Suitable steps are considered to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of the Icelandic ISS herring commercial fisheries. For example, mitigation measures include the ban on directed fishing for Atlantic halibut, spiny dogfish, Porbeagle sharks and Basking shark and the creation of permanently closed areas to protect known occurrences of vulnerable cold water corals (*Lophelia pertusa*) [182].

It is the determination of the Assessment Team that, where appropriate and relevant in the context of the Icelandic ISS herring commercial fisheries, suitable steps are considered to avoid, minimize or mitigate encounters with ETP species; therefore the Icelandic ISS herring fisheries are in full compliance with Clause 3.2.2.4 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

Non-Conformance Number (if relevant)	NA

[181] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967
[182] https://www.sciencedirect.com/science/article/pii/S0141113617303938

