

Iceland Responsible Fisheries Foundation (IRFF)

Iceland Responsible Fisheries Certification Programme



Icelandic Cod Commercial Fishery

3rd Surveillance Assessment Report

Certification Body (CB):	Global Trust Certification
Assessment team:	Vito Romito, Lead Assessor Dankert Skagen, Assessor
Fishery client:	Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland), The National Association of Small Boat Owners, Iceland (NASBO)
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Foreword

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

A full description of the standard-setting arrangements, normative references and processes can be obtained from the Iceland Responsible Fisheries Foundation that owns and operates the brand of Iceland Responsible Fisheries including the certification programme. For more details visit <https://www.responsiblefisheries.is/>.

1 Contents

Foreword.....	2
1 Contents	3
1.1 List of Figures	5
1.2 List of Tables.....	6
2 Glossary	7
3 Executive Summary	8
3.1 Assessment Team Details	8
3.2 Details of applicable IRF Documents.....	8
4 Fishery Applicant Details	9
5 Units of Certification.....	9
6 Assessment Process	10
6.1 Surveillance Meetings	10
7 Summary Findings	17
7.1 Relevant changes to Legislation/Regulations and the Management Regime	17
7.2 Stock status update	21
7.3 Landings update	29
7.4 Enforcement and Compliance update.....	34
7.4.1 Enforcement by Fiskistofa	38
7.4.2 Enforcement by the Icelandic Coast Guard	38
7.5 Bycatch, habitat and ecosystem update	42
7.5.1.1 Bycatch and associated species	42
Associated species catch and bycatch to the fishery	42
Endangered, Threatened and Protected (ETP) and vulnerable species interactions	59
7.5.1.2 Habitat.....	64
7.5.1.3 Foodweb considerations	71
7.6 Update on consistency to the fundamental clauses of the RFM Fishery Standard	73
Section 1. Fisheries Management	73
7.6.1 Clause 1.1 Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls	73
7.6.2 Clause 1.2 Research and Assessment	74
7.6.3 Clause 1.3 Stock under Consideration, Harvesting Policy and the Precautionary Approach	75
7.6.4 Clause 1.4 External Scientific Review	76
7.6.5 Clause 1.5 Advice and Decisions on TAC	76
Section 2. Compliance and Monitoring	77
7.6.6 Clause 2.1 Implementation, Compliance, Monitoring, Surveillance and Control	77
7.6.7 Clause 2.2 Concordance between actual Catch and allowable Catch	81
7.6.8 Clause 2.3 Monitoring and Control.....	82
Section 3. Ecosystem considerations.....	87
7.6.9 Clause 3.1 Guiding Principle	87
Associated species catch and bycatch to the fishery	87
Endangered, Threatened and Protected (ETP) and vulnerable species interactions	87
Foodweb considerations	92
7.6.10 Clause 3.2 Specific Criteria	93
8 Update on compliance and progress with non-conformances and agreed action plans	95
8.1.1 Closed non-conformances	95
8.1.2 Progress against open non-conformances	95
8.1.3 New non-conformances	115
8.1.4 New or revised corrective action plans	116
8.1.5 Update on Recommendations.....	120
9 Recommendations for continued certification	120

9.1	Certification Recommendation	120
9.2	Certification Committee Determination	121
10	References	122
11	Appendices	130
11.1	Appendix 4 – Assessment Team Bios	130
11.1.1	Assessment Team Bios	130

1.1 List of Figures

Figure 1. Screenshot of an example of the map in Hafsjá. The coloured fields are various closures. One (with yellow outline in the West) has been marked, and the label at the bottom gives details of that regulation. The small dots are location of catches (all gears in this example).	20
Figure 2. Spawning grounds for cod.	22
Figure 3. Distribution of fishing grounds and samples by gear for cod. Botnvarpa is bottom trawl, Dragnot is Danish seine, Net is gillnet and Line is long line.	23
Figure 4. Stations in the Spring (SMB) and Autumn (SMH) groundfish surveys.	24
Figure 5. Discard rates (% n) of cod 2001-2018, blue = demersal trawl, red = long line, yellow = gill net, green = demersal seine.	25
Figure 6. Results and retrospective patterns of key metrics when tuned with both surveys, spring survey ages 1 to 14, fall survey ages 3 to 13, with power assumption up to age 10.	26
Figure 7. Historical assessment results (2019 and 2021 assessments). The reference points indicated are those from the revision in 2022. From ICES advice 2022.	27
Figure 8. Total catch (landings – upper panel) and percentage of catch (lower panel) by fishing gear since 1994, according to statistics from the Directorate of Fisheries.	29
Figure 9. Spatial distribution of landings.	30
Figure 10. Historical landings of cod.	31
Figure 11. Quotas and catches (data from Table 6).	32
Figure 12. Net transfers of quota to and from cod in the Icelandic ITQ system by quota year. Between species (upper): Positive values indicate a transfer of other species to cod (not allowed), but negative values indicate a transfer of cod quota to other species. Between years (lower): Net transfer of quota for a given quota year.	33
Figure 13. Overall number of ICG inspection from 2012 to 2022. Source: ICG, November 2022.	39
Figure 14. Air Surveillance hours by RPAS (drone) between May 31st until August 31 st 2022.	40
Figure 15. Overview of ICG infringement reports in 2017- (1 st September) 2022. Source: provided by the ICG on the 8 th of November 2022.	41
Figure 16. Icelandic haddock harvest rate and biomass.	43
Figure 17. Icelandic saithe harvest rate and biomass.	44
Figure 18. Icelandic golden redfish harvest rate and biomass.	45
Figure 19. Demersal beaked redfish. Catches, and IS-SMH juvenile (≤ 30 cm) and biomass indices. Shaded area and error bars represent 95% CI. Red horizontal lines indicate average biomass indices for 2017–2019 and for 2020–2021 used in the advice calculations.	46
Figure 20. Greenland halibut harvest rate and biomass.	47
Figure 21. Ling harvest rate and biomass.	48
Figure 22. Starry skate harvest rate and biomass.	49
Figure 23. Atlantic wolffish harvest rate and biomass.	50
Figure 24. Spotted wolffish catches, juveniles index, harvest rate and biomass.	51
Figure 25. Greater silver smelt harvest rate and biomass.	53
Figure 26. Plaice harvest rate and biomass.	54
Figure 27. Lemon sole harvest rate and biomass.	55
Figure 28. Witch harvest rate and biomass.	56
Figure 29. Tusk harvest rate and biomass.	57
Figure 30. Dab harvest rate and biomass.	58
Figure 31. Mackerel harvest rate and biomass.	58
Figure 32. Leaf scale gulper shark caught in the annual autumn survey, from 1996 to 2022.	62
Figure 33. Dogfish caught in the annual spring survey, 1985 to 2022.	63
Figure 34. Greenland shark caught in the annual spring survey.	64

Figure 35. Annual total bottom-trawl fishing effort (1000 kW day) based on logbooks from trawl fishery targeting (a) fish, (b) Norway lobster, and (c) shrimp in the whole Icelandic Waters ecoregion between 1996 and 2021... 65

Figure 36. 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, 2014, and 2020. 66

Figure 37. MFRI overview of seabed mapping in Icelandic waters between 2000 and 2022. Source: <https://www.hafogvatn.is/en/research/seabed-mapping>. 67

Figure 38. Benthos recorded in the autumn Icelandic autumn groundfish survey in 2020. Number (kg) per tow. 69

Figure 39. Long term closures and selected fishing distribution around Iceland between 2009-2019. 70

Figure 40. Regulatory long-term closures in Iceland, all gear types. Red closures tend to be bottom trawl and sometime all gear closures. Yellow/orange boxes with internal lines near the coast (East, West and North West) are longline closures. Open yellow/orange boxes south and southeast of Iceland are lobster trawl restricted areas. For details on each closure including dates and gear restrictions please click on each red box in the Atlas/GIS website managed by Fiskistofa at <http://atlas.lmi.is/mapview/?application=haf> 71

Figure 41. Catches, acoustic index for immatures from autumn surveys, and SSB at spawning time (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. Catches from the fishing year 2021/22 are obtained at publishing date and therefore not final. 72

Figure 42. Main outcome of the FMRI assessment in 2022 compared with previous years. 74

Figure 43. Overview of ICG infringement reports in 2017- (1st September) 2022. Source: provided by the ICG on the 8th of November 2022. 80

1.2 List of Tables

Table 1. Relevant GULF RFM program documents including applicable versions.8

Table 2. Applicant details.9

Table 3. Unit of Certification (UoC).9

Table 4. Summary of assessment meetings that took place on October 11th – 13th 2022 in Iceland. 10

Table 5. Current values for reference points..... 28

Table 6. Recommended TAC, quotas and reported catches for Icelandic cod · 32

Table 7. Short term closures in Iceland for the years 2018-2022. 37

Table 8. Directorate inspector days on fishing vessels (Source: Fiskistofa, October 2022 on-site audit)..... 37

Table 9. Fiskistofa suspected violations in 2020 and 2021. Source: Fiskistofa 2020 and 2021 Annual Report. Note, the information between 2020 and 2021 is not directly comparable, and offenses of a similar nature may have been combined into one case. 38

Table 10. Status of bycatch and associated species in the cod target and non-target fisheries 42

Table 11. Short term closures in Iceland for the years 2018-2022. 77

Table 12. Fiskistofa suspected violations in 2020 and 2021. Source: Fiskistofa 2020 and 2021 Annual Report. Note, the information between 2020 and 2021 is not directly comparable, and offenses of a similar nature may have been combined into one case. 78

Table 13. TACs and actual catches, according to MFRI (source: MFRI, 2022 advice). 82

2 Glossary

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

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

3 Executive Summary

This 3rd Iceland Responsible Fisheries (IRF) surveillance audit was conducted in late 2022 by a team of two auditors, Vito Romito and Dankert Skagen, MD, whose experience, qualification and responsibilities has been detailed below in Section 3.1. These auditors also took part in previous surveillance audits for this fishery. The site visits for the current surveillance were held on site, in Iceland. Meetings with the Client, industry, management, science and enforcement representatives were held on week commencing the 10th of October 2022 to gather information on the fisheries under assessment and to discuss progress relative to any open non-conformances, in addition to the desktop review part of the audit. This fishery audit was combined with the other 6 fisheries certified under the IRF program.

The fishery under assessment continues to remain in compliance with the IRF Standard Revision 2.0. Corrective actions and progress to close the active non-conformances are behind target and new corrective actions have been submitted by the Client and accepted by the CB. No new non-conformance has been identified during the 3rd surveillance activities. The Assessment Team recommends for the existing certification to be maintained.

3.1 Assessment Team Details

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

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

3.2 Details of applicable IRF Documents

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

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

4 Fishery Applicant Details

Table 2. Applicant details.

Applicant Contact Information	
Organisation/Company Name:	Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland)
Date:	November 2020
Address:	Building:
	Street: Borgartún 35
	City: Reykjavík
	Country: Iceland
	Postal Code:
Phone:	(354) 591 0300
Web:	www.sfs.is
Contact person:	Heiðrún Lind Marteinsdóttir
Position:	CEO
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 Reykjavík
	Country: Iceland
	Postal Code: IS-101
Phone:	(354) 552 7922
Web:	www.smabatar.is
Contact person:	Örn Pálsson
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5 Units of Certification

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

Table 3. Unit of Certification (UoC).		
Species:	Common name (ENG and ISL):	Atlantic cod (Þorskur)
	Latin name:	<i>Gadus morhua</i>
Geographical Area(s)	Iceland 200-mile EEZ within FAO Fishing Area 27	
Stock(s)	Cod in ICES Division 5a (Iceland grounds)	
Management System	Ministry of Industries and Innovation (Iceland)	
Fishing gear(s)/method(s)	Demersal trawl; Long-line; Gill net; Danish Seine; Hook and line (Handline) by small vessels; Gears from other Icelandic fisheries legally landing cod*	
Client Group	Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland), The National Association of Small Boat Owners, Iceland (NASBO)	

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

6 Assessment Process

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

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

IRF surveillance audits are required to include:

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

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

6.1 Surveillance Meetings

The table below provides information about the on-site visit meetings held on October 11th – 13th, 2022 in Iceland for the combined audit of the Icelandic cod, haddock, saithe, Golden redfish, common ling, tusk and summer spawning herring commercial fisheries.

Table 4. Summary of assessment meetings that took place on October 11th – 13th 2022 in Iceland.

Meeting Date and Location	Personnel	Areas of discussion/agenda points
Date: Tuesday 11 th October 2022 Location: Fornubúðir 5 220, 220 Hafnarfjörður, Iceland	Marine and Freshwater Research Institute (MFRI): Bjarki Elvarsson, Advisory Group Lead, MFRI. Lisa Anne Libungan, Stock assessment herring, MFRI. Steinunn Olafsdottir, Marine biologist, MFRI. GT Assessment Team: Vito Romito Dankert Skagen	<u>Stock Assessment, Status and Advice</u> <ul style="list-style-type: none"> ▪ Time schedule for future benchmarks. ▪ Changes or revisions to sampling regimes? Contribution by observers at sea (does that mean Fiskistofa?) vs. at landings. At least for saithe, at sea sampling gets smaller fish, perhaps because that is what the freezer trawlers get. For some stocks (e.g. tusk), the number of samples is low – is it sufficient? Previously logistics has been mentioned as a problem – getting samples from landings far from the nearest observer. Is it still so? How about sampling from catches that are processed on board. ▪ Discards – updates or new studies? Plans for alternative approaches? • Herring: <ul style="list-style-type: none"> ○ There is a greater contribution from the East where summer spawners is 'bycatch'. How does that influence your control of the total catch over the whole year? ○ We see the clever way of including the I. Hoferi contribution to natural mortality. Are there thoughts of other ways to verify the estimates? ○ Any thoughts of revising reference points according to variations in natural mortality, and more in general: Any plans to revise reference points according to WGRES1-2 and other revisions of standards?

		<ul style="list-style-type: none"> ◦ Are there closures to protect herring nowadays? ▪ Tusk: <ul style="list-style-type: none"> ◦ The contribution from Subarea XIV. Any new developments or initiatives? ◦ Reasons for the shift in transfer of quotas – from negative to positive? Tusk was presumably less valuable than other species in the long line fishery, still true? ▪ Ling. Apparently, the number of otoliths read goes down for the long liners but not for the trawlers. Problem? ▪ Golden redfish. <ul style="list-style-type: none"> ◦ Agreement with Greenland - practiced but not formally effective any more: plans to revive it ◦ Plans for firmer action to bring the fishing mortality down to the target as the stock is expected to decline? ▪ Recent changes in assessment method, ling and tusk in particular. Have a brief discussion on motives, effects, further plans. ▪ Cod: <ul style="list-style-type: none"> ◦ Shift from ADCAM to Muppet. Retro-problem solved? There was a mention in the WG report that the discrepancy in the effect on assessed biomass between the surveys could be worth an in-depth study. Plans for that? ◦ Reviewers comments to WKICECOD 2021: Explore other time blocks and multi-fleet models for the fishery. Plans to do that? ◦ News about stock diversity and metapopulation ideas? ▪ Long term trends in recruitment: For herring, downward until 2017-18. Ling: Peak 2000 – 2010, Golden redfish down since 2013, Spotted wolffish downward 1993 – 2010, low since then. Mostly a scientific question – is there something in common, and are there thoughts about more generic ways of handling these fluctuations. ▪ Retrospective errors: Clearly, a good deal is being done on several stocks, noticed saithe in particular – is there more coming? A related question: Is there a better performance measure than Mohs rho? Another, perhaps related issue: Is this a case for really systematic studies of conflicting evidence in various sources of data – cfr. note on cod. ▪ Reference points: Thoughts on recent developments in ICES. How much does that matter for Iceland? Are there stocks where reference points cause problems (for example undue constraints on the fishery, difficulties with explaining changes and their implications etc.) <p><u>Ecosystem effects of the fisheries</u></p> <ul style="list-style-type: none"> ▪ Non-Conformance 1: (applicable to all certified fisheries): <i>Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch in fishing logbooks.</i> Regarding NC 1, what are the updates and developments addressing the issue for 2021/2022? ▪ Non Conformance 2: <i>There is insufficient evidence that adverse impacts of the cod, haddock and saithe fisheries on the following ecosystem components:</i> <ol style="list-style-type: none"> 1. <i>Spotted wolffish, and;</i> 2. <i>Common loon</i> <i>are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</i> Regarding NC 2, what are the updates and developments addressing the issue for 2021/2022? ▪ What survey abundance, interaction, catch and / or status updates information can be provided about the OSPAR listed threatened and/or declining species: 1)
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		<p>dogfish/spurdog, 2) Greenland shark 3) porbeagle shark, 4) basking sharks and 5) leafscale gulper sharks?</p> <ul style="list-style-type: none"> ▪ Can the assessment team be provided with total catch in numbers of Grey skate (<i>Dipturus flossada / batis</i>) for the latest available MFRI survey? Any additional updates on the state of this endangered species / complex? Any specific management measures for this species? ▪ Whales. Have there been any recent interactions (past 2 years) with Blue whales and Northern right whales for the fisheries under assessment? ▪ Updates on the use of use bycatch mitigation measures on longline fisheries (e.g. tori lines, night settings, acoustic devices) for gillnetters (e.g. pingers trials, actual deployment, other) and for trawlers (escape panels, excluder devices, bobbins, rock hoppers) or equivalent practices? To what extent are such bycatch reduction devices / practices used in these fisheries? ▪ Harbour porpoise updates in Iceland (e.g. surveys), status and management? ▪ Any updates on the work carried out by Iceland in relation to the upcoming US MMPA seafood importing requirements? ▪ Do you have updated bycatch information in Icelandic fisheries (e.g. cod gillnets, lumpfish nets, other gear) for A) harbour porpoise, harbour seals, grey seals, harp, ringed, hooded and bearded seals or B) seabirds for 2020-2021? (data was provided for 2016-2019). ▪ Any updated MFRI or other reports on the by-catch of seabirds and marine mammals in Icelandic fisheries (not specifically relating to lumpfish)? ▪ Any pingers testing updates from 2021 or 2022? ▪ Habitat. The 2021 ICES Ecosystem overview report¹ highlights that based on analysis of electronic logbook data an area of about 79,000 km² in total was disturbed/fished by towed bottom-fishing gears in 2013, composing 10% of the ecoregion. This figure jumped to 132,485 km² in 2018, corresponding to ca. 17.5 % of the ecoregion's spatial extent. This happened despite the fact that overall bottom trawl effort has decreased (Figure 7) between 2013 and 2018. Is that because the effort has spread out more in the region? Have any management considerations being discussed or made on how to potentially manage the spread of bottom trawl gear effort across the ecoregion (e.g. use of roller gear and/or raised footrope sweep as done in the Alaska BSAI flatfish fleet, other)? ▪ Based on the findings of the Novasarc work a paper on the distribution of indicator VME taxa was published by Burgos et. al (2020)². 12 months ago, the MFRI noted that the group that produced this publication received additional funding to develop this work further including managerial aspects in 2021. It was also noted that "Novasarc II" is now ongoing and will concentrate on updating predictive models and discuss the output for managerial purposes. Are there research or management updates resulting from the work of this group? ▪ Last year the MFRI reported noted that they had proposed new closures to protect vulnerable ecosystems to the Ministry of Fisheries. Did these include coral areas, deep-water sponges, sea pen beds and/or hydrothermal vents? Have there been recent research updates, management actions or new VME closures (proposed or implemented) in the past 12-18 months? ▪ Any new studies, papers or reports on the Icelandic marine ecosystem's structure or foodweb dynamics relating to groundfish or pelagic species?
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¹ https://www.hafogvatn.is/static/files/2022_2/ecosystemoverview_icelandicwaters_2021.pdf

² <https://www.frontiersin.org/articles/10.3389/fmars.2020.00131/full>

<p>Date: Wednesday 12th October 2022</p> <p>Location: Skógarhlíð 14, 105 Reykjavík</p>	<p>Icelandic Coast Guard:</p> <p>Asgrimur L. Asgrimsson, Chief of Operations, Icelandic Coast Guard.</p> <p>Björgólfur H. Ingason, Chief controller, Icelandic Coast Guard;</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Enforcement Laws and Regulations. In the past 12 months, have there been any significant amendments or changes to Icelandic fisheries laws / regulations with a bearing on enforcement activities? ▪ Post Covid operational updates. ▪ Has the level of resources and monitoring effort remained similar/changed in past 1-2 years? ▪ Have there been changes over the 2021/2022 season in the systems or patrolling vessels/assets used for enforcement (i.e. new vessels or other)? ▪ How many airborne fisheries patrol hours have been conducted over the last fishing season? ▪ Any other updates regarding enforcement assets (e.g. drones)? Use other electronic reporting systems? ▪ Boardings rate and type/ number of violations recorded (most recent year/season)? What are the most commonly occurring violations? Is enforcement data available by gear type or fishery (i.e. for cod, haddock, saithe, golden redfish, ling, tusk, herring under assessment)? Foreign vessels boarded? <i>Could you please provide us with tables/figures for this information as done in past years?</i> ▪ How many prosecutions and reprimands made against skippers did these activities (overall enforcement activities) result in? <i>Could you please provide us with tables/figures for this information as done in past years?</i> ▪ Are there many violations of fishermen fishing over their TAC, or buying new TAC late (for overages)? ▪ This is the topic of Non Conformance 1. Enforcement of, and levels of compliance with, logbook reporting of interactions/bycatch between seabirds and marine mammal (especially in gillnets, longlines and trawl gear)? Is the new App in use in small vessels effective for catch recording? Updates and changes in the past 1-2 years? Any prosecutions for failing to report bycatch? ▪ This is the topic of Non Conformance 2. Spotted wolffish can now be released after capture as per new 2020 regulation. Are fishermen reporting released vs landed spotted wolffish as different entries in the logbooks? Any other information on the subject? ▪ Have there been any major changes in overall violation/compliance rate in the past 2-3 years? ▪ Reporting requirements and or issues with lost fishing gear (e.g. longline, gillnets)? ▪ Any changes to the range of monetary and operational penalties for infractions to fisheries regulations? ▪ Are there any repeating offenders in Icelandic waters? ▪ Any instances of serious IUU fishing by Icelandic or foreign vessels in the past 2 years?
<p>Date: Wednesday 12th October 2022</p> <p>Location: Planned to be in at the Fiskistofa HQ but revised to remote video call due to staff unavailability.</p>	<p>Directorate of Fisheries/Fiskistofa:</p> <p>Erna Jónsdóttir, Head of Administration Division, Fiskistofa.</p> <p>Sævar Guðmundsson, Head of Department, Fiskistofa.</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Legislation. Changes that matter? Plans for revisions – there was a process some years ago to revise fishery regulations as a whole, has it stopped? Any good places to find laws and regulations on the internet, English translations in particular. ▪ Rules and regulations for the smaller vessels – any updates for the past 2 seasons? ▪ Transfer of quotas, in particular between species. Is this a potential problem if they lead to overages – are there thoughts of revisions or modifications of that rule? Is there information about which species are source and receiver? ▪ What is the actual status now for accounting for expected catches by foreign vessels when setting the local TAC? Haddock and several others. ▪ Changes or revisions to sampling regimes? Contribution by observers at sea (does that mean Fiskistofa?) vs. at landings. At least for saithe, at sea sampling gets smaller fish, perhaps because that is what the freezer trawlers get. For some stocks (e.g. tusk), the number of samples is low – is it sufficient? Previously, logistics has been mentioned as a problem – getting samples from landings far

		<p>from the nearest observer. Is it still so? How about sampling from catches that are processed on board.</p> <ul style="list-style-type: none"> ▪ Discards – any monitoring activities by Fiskistofa? ▪ How many days have directorate inspectors spent on board of fishing vessels in the last fishing season for which information is available? What is the average inspector coverage % on bottom trawlers, longliners, gillnetters (cod if possible) and pelagic trawlers? Can the assessment team be provided with figures for the 2021/2022 season, as done in previous audits? ▪ The short-term closure monitoring system was transferred to Fiskistofa in the fall of 2020. Regulation regarding the short-term closures was changed in 2020, and the size limit was increased for cod, which led to significant decrease in the number of closures.” How many closures have there been in 2021/2022 for each species in question (cod, haddock, saith, redfish, ling, tusk, ISS herring)? ▪ Monitoring of less valued species including elasmobranchs in the catch record (landed species) – is this something which has been started already by Fiskistofa? We note that a number of shark species are listed by OSPAR as threatened and/or declining species: 1) dogfish/spurdog, 2) Greenland shark 3) porbeagle shark, 4) basking sharks and 5) leafscale gulper sharks? ▪ 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, what progress / updates have there been in the past 12 months? 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 2021/22? Are there examples of this? <ul style="list-style-type: none"> 1. <u>Corrective Action relating to Non-Conformance 1</u> (applicable to all certified fisheries): <i>Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch in fishing logbooks.</i> Regarding NC 1, are there updates, new information or developments addressing the issue? 2. <u>Corrective Action relating to Non-Conformance 2</u>: <i>There is insufficient evidence that adverse impacts of the cod, haddock and saithe fisheries on the following ecosystem components:</i> <ul style="list-style-type: none"> - <i>Spotted wolffish, and;</i> - <i>Common loon</i> <i>are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</i> Regarding NC 2, are there updates, new information or developments addressing the issue? ▪ 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?
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		<ul style="list-style-type: none"> ▪ 2021 Fiskistofa Annual report (https://www.fiskistofa.is/media/arsskyrslur/arsskyrsla-2021.pdf). We have questions about a few entries when compared form 2020 and 2021. Can you comment on some of the entries where we couldn't find and compare data in the 2021 report, especially the Afladagbók, Vanskil afladagbókar and the Mál vegna umframafra entries? ▪ Collaboration between the Coast Guard and Fiskistofa relating to fisheries monitoring and enforcement activities. Updates for the past 12-18 months? Any specific updates relating to work on discards, bycatch monitoring, new app reporting (small vessels)? ▪ 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? What can Fiskistofa observers say about the use of these devices in the Icelandic fisheries? ▪ Any other mentionable changes or updates for the 7 fisheries in question that may relate to day to day operations and monitoring activities worth discussing?
<p>Date: Thursday 13th October 2022</p> <p>Location: Remote, Video Call</p>	<p>Yann Rouxel, Bycatch Programme Manager</p> <p>The Royal Society for the Protection of Birds (RSPB)</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Seabird bycatch data ▪ Adoption of bycatch reduction devices in the fleet ▪ Non Conformances relating to seabird bycatch and timeline for closure
<p>Date: Thursday 13th October 2022</p> <p>Location: Iceland Ocean Cluster (Hus Sjavarklasans ehf. (Grandagardi 16, Reykjavík) – new IRFF office</p>	<p>Client meeting (including closing meeting)</p> <p>Kristján Þórarinsson, Population Ecologist, Fisheries Iceland;</p> <p>Hrefna Karlsdóttir, Senior Advisor at Fisheries Iceland.</p> <p>Iceland Responsible Fisheries foundation (IRFF) Sigrid Merino, CEO, IRFF.</p> <p>GT Assessment Team: Vito Romito Dankert Skagen</p>	<ul style="list-style-type: none"> ▪ Brief review or key highlights of the 2021/2022 fishing season for cod, haddock, saithe, golden redfish, ling, tusk and ISS herring. Any key issues or updates from an industry perspective? ▪ Any significant changes in the management system, key laws or regulations in the past 12 months? Other regulatory updates of mention? ▪ Any updates relating to the day to day operations of the large and small fleet sectors? ▪ U.S. MMPA seafood importing requirements. What work has occurred in Iceland in the past 12 months to address these restrictions? ▪ 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 / or practices used in these fisheries? Any updates? <p>Non-Conforming Areas and Corrective Actions</p> <ul style="list-style-type: none"> ▪ Corrective Action relating to Non-Conformance 1: <i>Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch in fishing logbooks</i> Regarding NC 1, what are the updates, new information or developments addressing the issue? Any recent updates relating to the smartphone app deployed to facilitate recording of marine mammal and seabirds' bycatch in smaller vessels? Feedback from the

		<p>small vessel sector about implementation? Is it helping collect bycatch information?</p> <ul style="list-style-type: none"> <p>▪ Corrective Action relating to Non-Conformance 2: <i>There is insufficient evidence that adverse impacts of the cod, haddock and saithe fisheries on the following ecosystem components:</i> <i>Spotted wolffish, and;</i> <i>Common loon</i> <i>are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</i> Regarding NC 2, what are the key developments regarding spotted wolffish (e.g. relating to research activities and/or live releases in the fishery)? Has spotted wolffish been released in the past season? Catches in 2020/2021 were 1,300 t against a TAC of 314 t, while catches in 2021/2022 were 927 t (Fiskistofa website) against a 377 t TAC. Is the excess catch (over the TAC) released alive? Can we confirm if the excess catch (over the TAC) has been released alive and if that catch is reported as a separate entry in the logbooks?</p> <p>▪ Any other changes or updates of mention for the 7 fisheries in question that may relate to day to day operations and industry activities, management, research, assessment and advice, or mitigation of ecosystem effects of fisheries we should discuss?</p> <p>▪ General summary of findings from the week's meetings.</p> <p>▪ Corrective actions for active non-conformances, updates, clarifications and discussions.</p> <p>▪ Reporting timelines and next steps in the audit process.</p> <p>▪ Questions and answers.</p>
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7 Summary Findings

7.1 Relevant changes to Legislation/Regulations and the Management Regime

Fisheries legislation

Iceland has an established Marine Policy and a structured management system³ covering all commercial species, including cod⁴. There is a principal Act (*last amendment No 116/2006*)⁵ and a number of supporting Acts and Regulations for the management of the fishery.⁶ Article 1 in the principal act states the overall objective for Icelandic fisheries management: *The exploitable marine stocks of the Icelandic fishing banks are the common property of the Icelandic nation. The objective of this Act is to promote their conservation and efficient utilisation, thereby ensuring stable employment and settlement throughout Iceland.*

Institutions

There are a number of inter-related government agencies within the system under the direction of the Ministry of Industries and Innovation which has ultimate responsibility. The Ministry of Food, Agriculture and Fisheries⁷ in Iceland is the principal management organization responsible for Icelandic fisheries and has the ultimate responsibility for fisheries management. They act according to law issued by the parliament (Alþingi), and according to advice from the Marine and Freshwater Research Institute (MFRI). The executive body is the Fisheries Directorate (Fiskistofa)⁸ which is responsible for the implementation of Fishery Regulations on behalf of the Ministry. Key functions of the Directorate of Fisheries include implementation of regulations, collection and collation of fishery catch data, managing and policing the Icelandic ITQ system and supporting research, survey work and Coastguard surveillance activities. The Icelandic Coast Guard⁹ is responsible for control at sea, both of catches and the quality of the vessels. It performs sea and air patrols and monitoring of fishing within the Icelandic zone. It also operates the Icelandic Maritime Traffic Service within its operations centre which has a key role in ensuring safety at sea, but can also take action if the behaviour of a fishing vessels is unusual. The Marine and Freshwater Research Institute (MFRI)¹⁰ conducts a wide range of marine research and provides the Ministry with scientific advice. MFRI has wide international cooperation in all major fields of marine science, as indicated by its publication record¹¹.

A recent change in the legislation has facilitated surveillance of activities at sea, in order to facilitate enforcement of rules and regulations in fishing operations and handling of catches¹².

TAC and ITQ system

Limiting the total annual catch of cod 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.

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

4 <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/)

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

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

7 <https://simplebooklet.com/stjrnfiskveia20212022|gogreglugerir>

8 <https://www.government.is/ministries/ministry-of-food-agriculture-and-fisheries/>

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

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

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

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

13 <https://www.althingi.is/altext/stjt/2022.085.html>

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)¹³, according to standards approved by ICES in regular benchmark assessments¹⁴. ICES provides advice, which normally, but not necessarily is followed by MFRI and subsequently by the Ministry. The ministry also seeks advice from ICES on management plans.

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

There is a management plan in place for most commercial stocks in Iceland, including cod, The statement by the Ministry on the management process was revised in 2022 and now states: *'The decision on the annual TAC for each stock is by law anchored in the formal advice presented by the Marine and Freshwater Research Institute in June each year. ICES provides advice as well so both ICES and the MFRI advise on research and harvesting policy in general. The recommendation given by the MFRI for the main commercial species is peer reviewed by the Advisory Committee (ACOM) of ICES every year. While the scientific advice has been closely followed by the Minister of Fisheries and Agriculture in recent years, the purely scientific advice is nonetheless subject to a wide formal and informal consultative process involving industry stakeholders et al.'*¹⁵

When harvest rules have been established in a management plan, as for cod, the Ministry recognizes an obligation to set the TAC accordingly. The current management plan for cod was last examined and approved by ICES in 2021.¹⁶ The plan is publicly available¹⁷. The revision led to changes in some reference points, but not in the rule itself.

The total annual TAC is distributed on vessels as individual transferable quotas (ITQ), managed by the Directorate. The ITQ system has evolved gradually in Icelandic fisheries management and was fully implemented in 1990. The legal basis for the ITQ system is the principal fisheries management act (116/2006)¹⁸. The main elements are:

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

Quotas can be transferred between vessels; this applies both to quota shares and annual catch allotments. For most stocks, including cod, quotas can also be transferred between years and between species, but only within limits. Specific for cod is that although cod quotas can be used to cover other species, quotas of other species cannot be used to account for catches of cod. Quota transfer is intended to promote rationalisation and thus increase profitability in the industry, but there has been concern that it can be used to legalize over-exploitation of vulnerable but valuable species. An overview of the system is provided in Agnarson & al, 2016¹⁹. A recent study

13 https://ices-library.figshare.com/articles/report/Northwestern_Working_Group_NWWG_/19771381?file=36007538

14 https://ices-library.figshare.com/articles/report/Workshop_on_the_re-evaluation_of_management_plan_for_the_Icelandic_cod_stock_WKICECOD_/18621704

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

16 https://ices-library.figshare.com/articles/report/Iceland_request_for_a_re-evaluation_of_the_management_plan_for_cod_in_Icelandic_waters/18638597

17 <https://www.hafogvatn.is/static/extras/images/01-cod1325960.pdf>

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

19 <https://www.sciencedirect.com/science/article/pii/S0308597X16302238>

of the transfer system in Iceland (Oostdijk & al 2020)²⁰ describes the performance of this system in detail and concludes that *'The trend toward individual quota and discard bans presents a challenge for mixed fisheries: how to avoid widespread under-utilization of quota due to choking effects of individual species for which quota is exhausted. Iceland's demersal fishery has met this challenge using the most elaborate set of balancing mechanisms in the world.....The absence of persistent overfishing of individual stocks is attributed to limits that have been tightened over time and are very strict for the primary target species. These results highlight the potential for balancing mechanisms to facilitate sustainable exploitation of distinct interconnected resources and the importance of adapting implementation to local circumstances.'*

Control of landings

All fish that is caught (with very few exceptions) has to be landed and the landings have to take place in authorized ports and weighed by authorized weighers²¹. These landings are reported to the Directorate and are the primary source of catch data. All landings have to be accounted against a quota. If the vessel does not have a quota for a landing, it has to buy one, and there is an efficient market for buying and selling quotas. To reduce the incentive for high-grading, undersized fish that is caught has to be sold but only part of the catch is subtracted from the quota and the fisher gets a strongly reduced price. The surplus goes to a fund to promote scientific work of the MFRI.

General fishing permits are of two types, a general fishing permit with a catch quota and a general fishing permit with a hook-and-line catch quota. In addition, parts of the total TAC is set aside for special purposes (for example Strandveidar²², Bygdakvoti²³), mostly to support local communities and small scale fisheries.

Logbooks are compulsory, and recently, only electronic logbooks (or mobile phone apps) are accepted²⁴. The fishing year in Iceland runs from 1st September - 31st August.

Protective measures

These include area closures (temporary and permanent) and gear restrictions. There is an extensive system of area closures that are to a large extent, but not exclusively, designed to avoid exploitation of cod at the spawning grounds in the spawning season and to avoid catching juvenile fish. Closures can be permanent or temporary. Permanent closures are according to regulations by the Ministry and can be valid for parts of the year or the whole year. They are intended to protect spawning grounds, nursery areas, vulnerable habitats etc. and most of them have been in place for many years. The latest revision was in 2019²⁵. Fiskistofa has recently launched a map solution (Hafsjá) to inform about all closures (permanent and short term) as well as other information (Figure 1)²⁶.

20 <https://www.pnas.org/doi/full/10.1073/pnas.2008001117>

21 <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/20213>

22 <https://island.is/strandveidar>

23 <https://island.is/bygdakvoti>

24 <https://island.is/afladagbok>

25 <https://island.is/reglugerdir/nr/0960-2019>

and

<https://island.is/reglugerdir/nr/0961-2019>

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

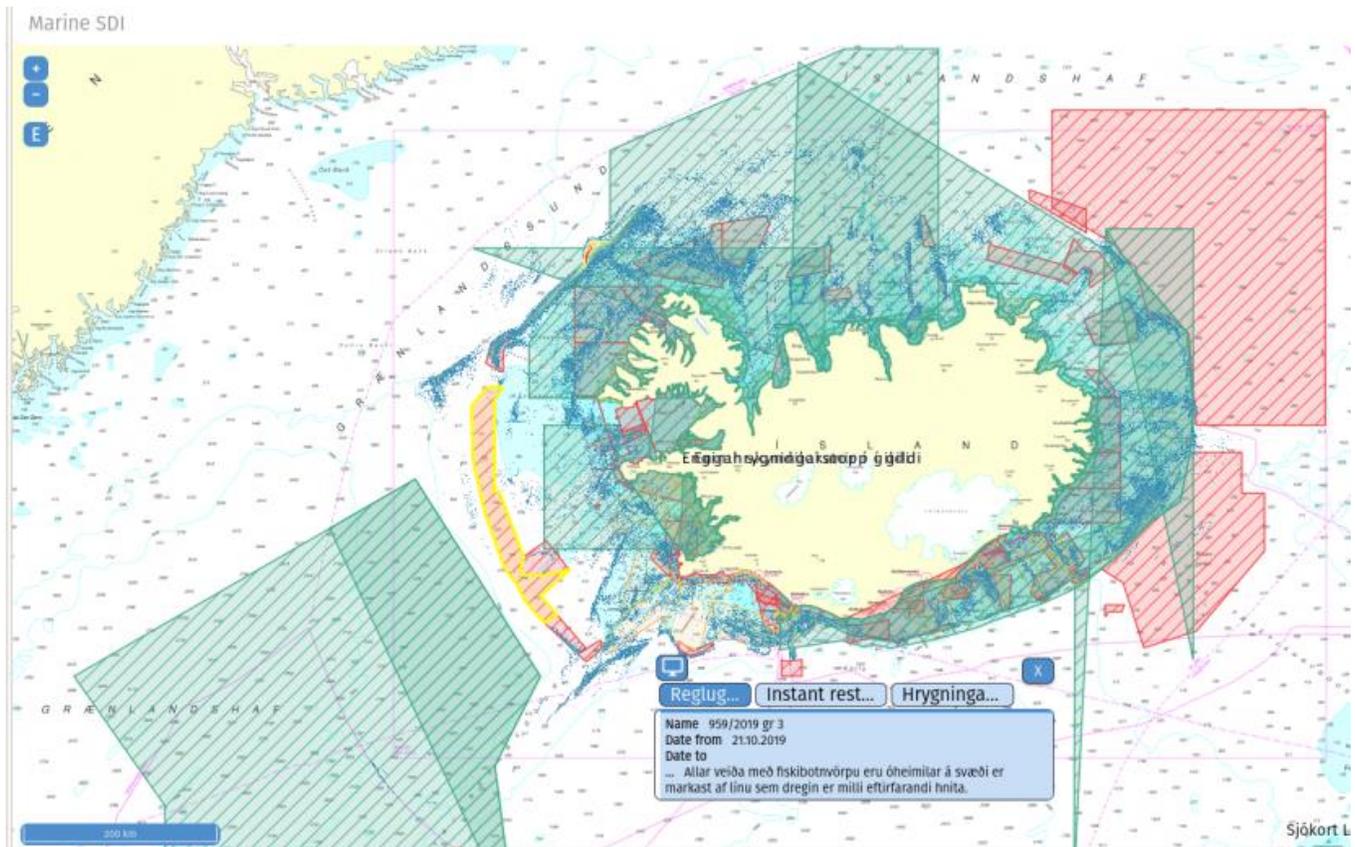


Figure 1. Screenshot of an example of the map in Hafsjá. The coloured fields are various closures. One (with yellow outline in the West) has been marked, and the label at the bottom gives details of that regulation. The small dots are location of catches (all gears in this example).

Temporary closures are as a rule triggered by reports from the Coast Guard, Directorate or others of too much undersized fish. Recently in 2020, the Directorate has taken over the administration of these closures from the MFRI. Such closures are introduced on short notice (hours) and are valid for 2 weeks. They are published on the website of the Directorate, and shown in the Hafsjá map. Last year, due to Covid19 restrictions and altered criteria for undersized fish, there were no temporary closures.

There are mesh size regulations in place to protect juveniles; the standard mesh size in trawl is 135 mm²⁷. If undersized fish are caught, they have to be landed. Special rules apply for payment to encourage landing, but discourage catching of undersized fish.

Discards are prohibited in Iceland.²⁸ Discards are not included in the assessment and are considered to be small. To some extent they are monitored, mostly for cod and haddock.

²⁷ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/4032>

²⁸ <https://www.althingi.is/lagas/nuna/1996057.html>

International relations

Policies incorporate a number of International Agreements and declarations²⁹, 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. Iceland has broad international scientific cooperation through organisations such as [the Northeast Atlantic Fisheries Commission](#) (NEAFC)³⁰, [the Northwest Atlantic Fisheries Organization](#) (NAFO)³¹, and [the North Atlantic Marine Mammal Commission](#) (NAMMCO)³². Icelandic scientists have been involved in many international projects arranged by these organizations and in co-operative projects with research institutes and universities.

7.2 Stock status update

Cod is the most important species in Icelandic fisheries. Throughout the centuries, cod has been the lifeline of the nation, both as its main food supply, and its chief export product. Historical evidence suggests that story of Icelandic fish export dates back to the 12th century at the very least.³³

Stock identity

Cod in Iceland is regarded as a local stock, confined to Icelandic waters. There may be larval drift from Iceland to Greenland, and there has been episodes with migration of adult cod from Greenland to Iceland. Some of these have been included in the assessment, the most recent being the 2003-year class in 2009. The effect on the overall assessment is minimal. Extensive tagging experiments spanning with some hiatuses over the last 100 years indicate that significant emigration of adult cod from Iceland to other areas may be rare³⁴.

Cod is distributed all around Iceland, but with highest concentrations in the Northern part of the coast and shelf. Spawning is all around the island, but mostly in the South, Southwest and West (Figure 2). Spawning in the North has increased lately. There are some indications of genetic differences between North and South, and some kind of diversity in management has been discussed (Pampoulie *et al.*, 2007 and 2008)³⁵. There are plans for a new project in 2023 to clarify the stock structure³⁶.

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

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

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

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

33 <https://www.iceland.is/trade-invest/fisheries>

34 <https://ices->

library.figshare.com/articles/report/Stock_Annex_Cod_Gadus_morhua_in_Division_5_a_Iceland_grounds_/18622199

35 Pampoulie, C., Ruzzante, D. E., Chosson, V., Þóra Dögg Jörundsdóttir, Þ. D., Taylor, L., Þorsteinsson, V., Daníelsdóttir, A. K., Marteinsdóttir, G., 2007. The genetic structure of Atlantic cod (*Gadus morhua*) around Iceland: insight from microsatellites, the *Pan I* locus, and tagging experiments. Canadian journal of Fisheries and Aquatic Sciences 63: 2660-2674.

and

Pampoulie, C., Jakobsdóttir, K. B., Marteinsdóttir, G., and Þorsteinsson, V., (2008). Are Vertical Behaviour Patterns Related to the Pantophysin Locus in the Atlantic Cod (*Gadus morhua* L.)? Behavior Genetics 38: 76-81

36 Communicated at web meeting with MFRI. Nov. 4, 2021

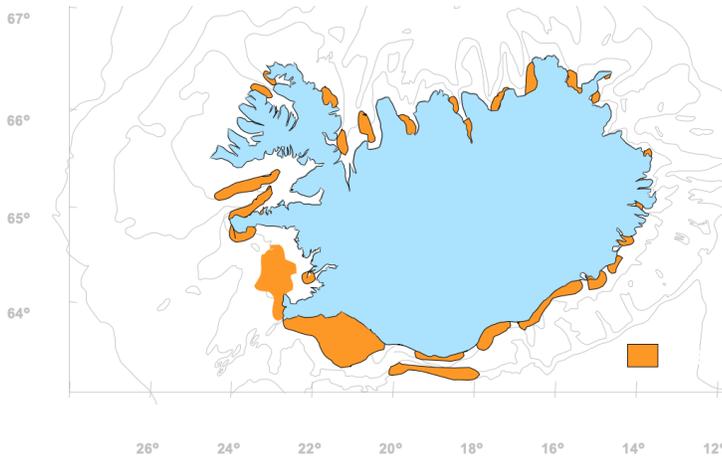


Figure 2. Spawning grounds for cod.

Assessment data

The catch data in numbers at age are obtained by combining landings data with age distributions from samples. The vast majority of the catches are taken by Icelandic vessels in Icelandic waters. Cod is caught all around the island (Figure 3) primarily by demersal trawlers (49%) and long-liners (32%). Catches by gillnet have gone down since 2000 and is now 7%. Danish seine and jiggers take 6% each.

The sampling of catches³⁷ is fully computerised and directly linked to the daily landings statistics available from the Directorate of Fisheries. The system has remained unchanged since 2015. The sampling design is based on getting a certain number of samples per tonnes landed stratified by area landed, gear and time, but sampling is not directed towards specific species. For each fleet/gear and each landing strata there is a specific target of landings value; once the cumulative daily landings value pass the target value an automatic request is made to the sampling team for a sample to be taken. Most of the age samples are taken from landings by the branches of the MRI but the rest by observers from the Directorate of Fisheries. The logistics may sometimes be problematic, both because of availability of staff and of sorting on board. For cod, there seems to be a fair coverage of the trawl fisheries. The sampling from the line fishery apparently may be less representative.

37 [https://ices-library.figshare.com/articles/report/Stock Annex Cod Gadus morhua in Division 5 a Iceland grounds_/18622199](https://ices-library.figshare.com/articles/report/Stock_Annex_Cod_Gadus_morhua_in_Division_5_a_Iceland_grounds_/18622199)

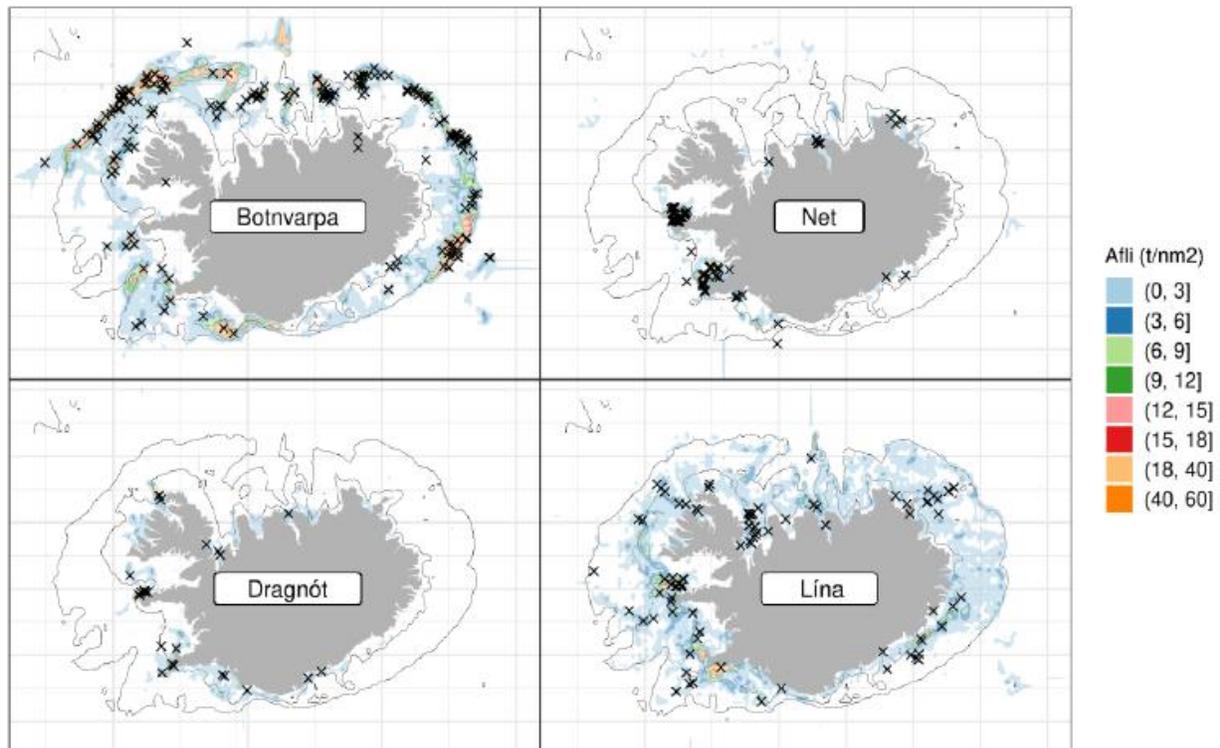


Figure 3. Distribution of fishing grounds and samples by gear for cod. Botnvarpa is bottom trawl, Dragnót is Danish seine, Net is gillnet and Line is long line.

Catch numbers-at-age are derived from the landings data using length distributions and age-length keys. Weights at age are calculated from weight-length relationships with parameters estimated for each area, season and fleet. The method has remained consistent for many years.

Landings in Iceland are restricted to authorised ports where the amounts landed are recorded by certified weighers³⁸. The landings data are managed by the Directorate of Fisheries and used as landings data in the assessment.

Survey data

There is a spring groundfish survey and an autumn groundfish survey, both covering the whole Icelandic EEZ (Figure 4). These surveys are more extensive than most surveys that are used around the world for routine assessments (530 stations in the spring survey, 380 stations in the autumn survey) There are only minor changes from year to year in the coverage. An extensive survey manual is available³⁹.

38 <https://island.is/reglugerdir/nr/0745-2016>

39 <https://www.hafogvatn.is/static/research/files/fjolrit-156.pdf>

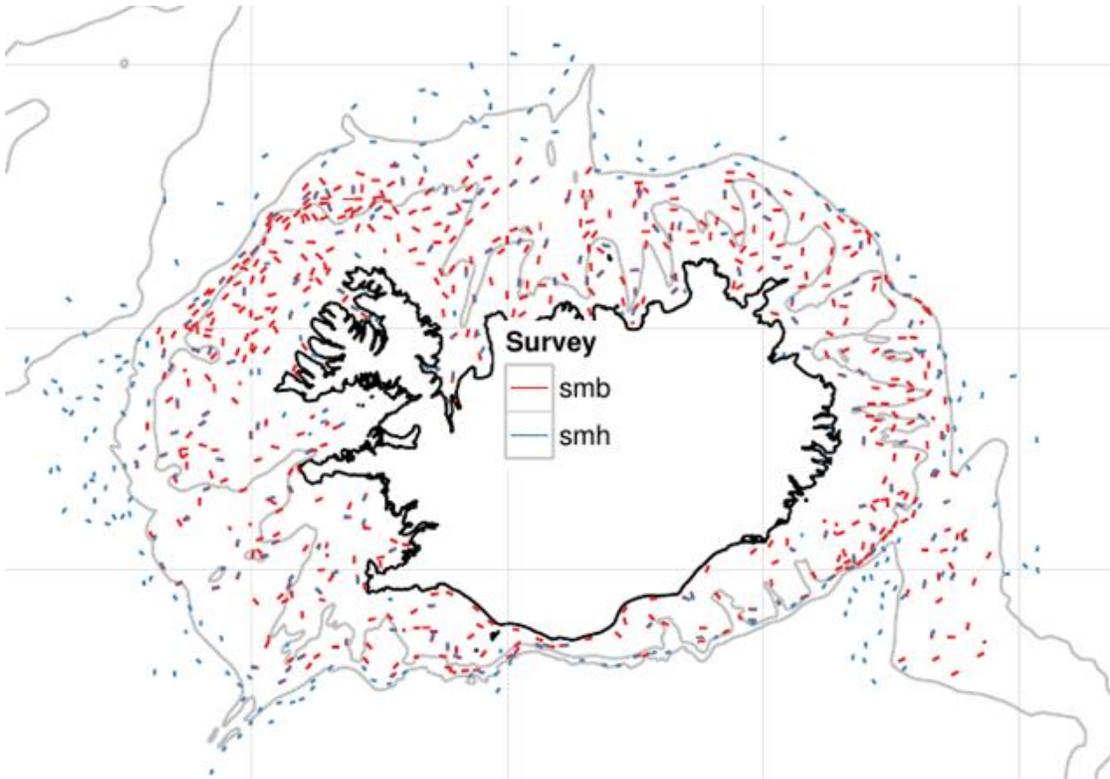


Figure 4. Stations in the Spring (SMB) and Autumn (SMH) groundfish surveys.

One or both of the surveys are used for the stock assessments of most demersal species. For cod, both surveys are used. Previously, the results of the cod assessment was sensitive to which survey was used. After the last revision, abandoning the autumn survey makes little difference.

Discards

Discarding is prohibited in Iceland⁴⁰. It has been regularly monitored by comparing size distributions in self-reported catches and those taken by on-board inspectors; this method insures against high-grading, but not necessarily against discarding for other reasons. The most recent estimates for discards of cod (in 2016-18) show as consistent increase for cod, to over 12% by number and 3.9% by weight in 2017 (Figure 5). In the other fisheries, the discarding seems to be low and stable⁴¹. However, newer tools for inspection (drones in particular) have revealed that discards may be more frequent than assumed so far. The data are still few and fragmentary, however. In the stock assessment, discards are considered negligible and are not included.

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

41Guðjón Már Sigurðsson & al. Mælingar á brottkasti þorsks og ýsu 2016-2018, available at: <https://www.hafogvatn.is/static/research/files/1608029972-hv2020-41.pdf>

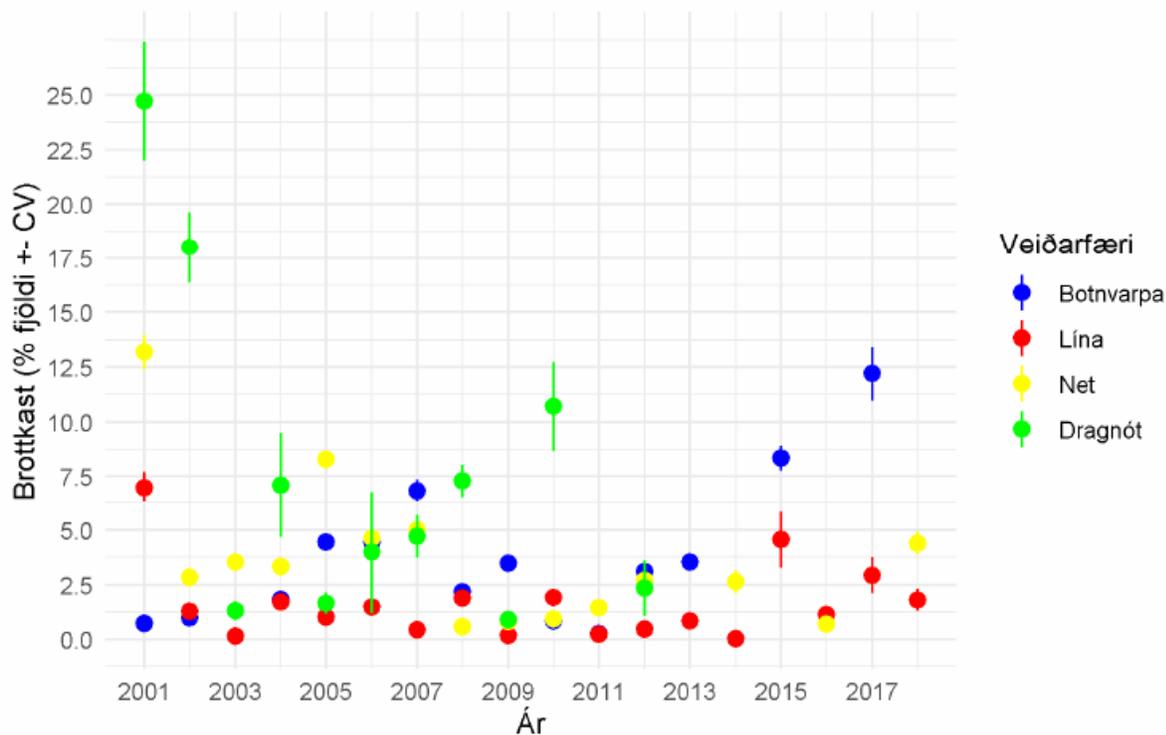


Figure 5. Discard rates (% n) of cod 2001-2018, blue = demersal trawl, red = long line, yellow = gill net, green = demersal seine.

Assessment method and performance

The assessment method was revised and approved by ICES in 2021⁴². This revision included changes that had been planned for several years. The main changes were introduced already in 2020, when Iceland did not involve ICES in the assessment due to the Covid 19 disease epidemic.

One purpose of the revision was to unify the software that is used for various stocks, which led to a transition from the ‘ADCAM’ software to the ‘Muppet’ (Multi Use Pre Programmed Ecosystem Toolbox)⁴³ software. Both are forward projecting stock models fitted to catch and survey data using the AD Model builder tools, but the ‘Muppet’ has fixed selections at age while ADCAM had a random walk model for selection. ‘Muppet’ can also be used directly as a simulation tool for evaluation of harvest rules. The intention is to stop maintaining the ADCAM and concentrate on the ‘Muppet’, which also has a more modern and orderly code.

Other changes were directed at improving the performance of the assessment. The age span in the survey data was extended from 10 to 14 years to include ages that are now quite abundant in the stock. The ages 1 and 2 were dropped from the autumn survey and the age span where a non-linear (power) relation between stock numbers and survey indices is assumed was increased, which led to a more convincing selection pattern in the surveys and brought the signals in the two surveys closer to each other. The CVs at age for the surveys, which determines the

42 https://ices-library.figshare.com/articles/report/Iceland_request_for_a_re-evaluation_of_the_management_plan_for_cod_in_Icelandic_waters/18638597?backTo=/collections/ICES_Advice_2021/5796932

43 https://github.com/Hafro/Muppet_HCR/

relative weighting of the ages in the survey likelihood functions, were also updated. This has to be done outside the model.

Figure 6 shows the analytic retrospective pattern, with the settings used in the final assessment. With these settings, most of the retrospective discrepancies disappeared. However, the results deviated considerably from those obtained in previous years (see Figure 7).

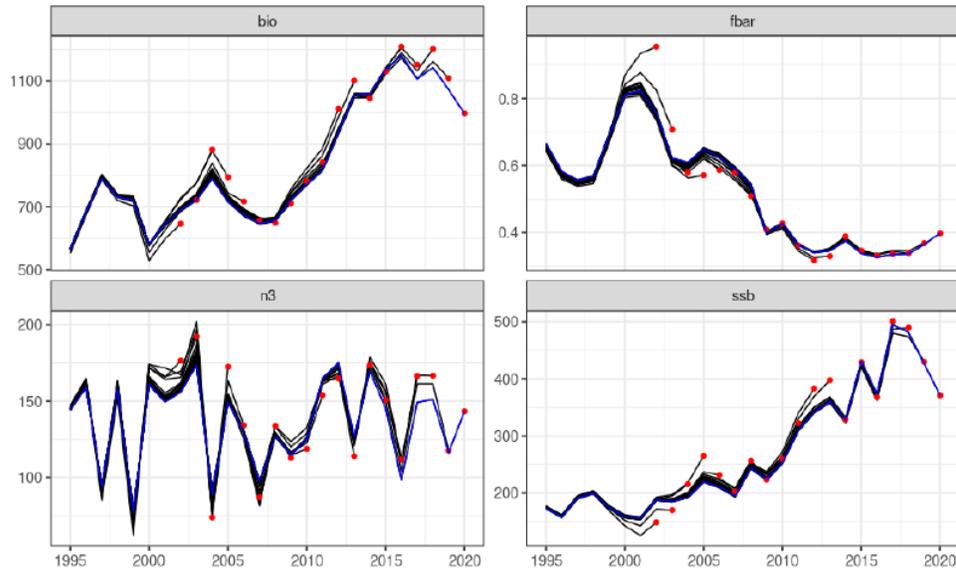
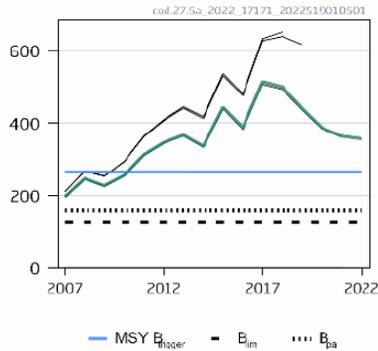


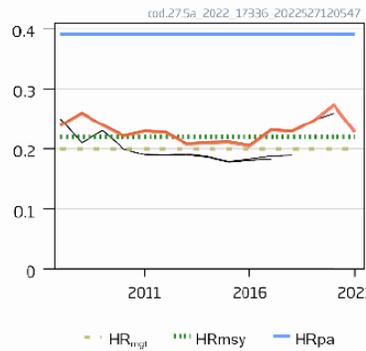
Figure 6. Results and retrospective patterns of key metrics when tuned with both surveys, spring survey ages 1 to 14, fall survey ages 3 to 13, with power assumption up to age 10.

The result of these amendments was a reduced estimate of abundance and increased estimate of harvest rate in most of the time series (Figure 7); for the recent years the change was about 20%. The ‘Muppet’, ADCAM’ and SAM software gave quite similar results when comparable settings were applied.

SSB (1000 t)



Harvest Rate



Rec (age 3; Millions)

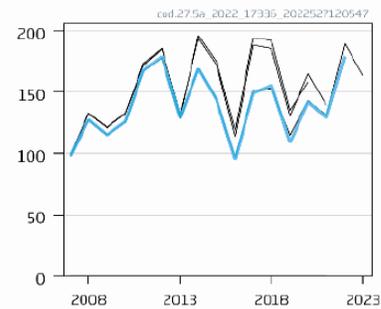


Figure 7. Historical assessment results (2019 and 2021 assessments). The reference points indicated are those from the revision in 2022. From ICES advice 2022⁴⁴.

Assessment results

The main results are shown in Figure 7. Even with the lower abundance estimates in the new assessment setup, the stock is far above the limit and pa values and also well above the MSY Btrigger which was the rebuilding target when the present rule was designed in 2009. The harvest rate has had an increasing trend in the last 2-3 years and is now estimated to be above the target value. The SSB is declining. The recruitment was poorer for some years but the last two-year classes look promising.

Harvest rule and reference points

Management according to a harvest rule has evolved gradually in Iceland since the early 1990s. The formulation of the rule has changed gradually since the 2007/2008 fishing year, the rule has been unchanged. It was tested by simulations and endorsed at the ICES benchmark process in 2021.

The plan states (according to the ICES advice 2022) the following:

Management plan	<p>The Icelandic Ministry of Industries and Innovation has a fisheries management plan for Icelandic cod (MII, 2015). The plan, which aims at providing maximum sustainable yield, was re-evaluated by ICES, found to be consistent with both the precautionary principle and ICES MSY approach (ICES, 2021a). According to the management plan, the TAC for the fishing year $Y/Y + 1$ (1 September of year Y to 31 August of year $Y + 1$) is calculated as follows:</p> $TAC_{Y/Y+1} = \frac{\min\left(\frac{SSB_Y}{MGT B_{trigger}}, 1\right) HR_{mgt} B_{4+,Y} + TAC_{Y-1/Y}}{2}$ <p>where $B_{4+,Y}$ is the biomass of cod aged 4 and older in year Y and $MGT B_{trigger} = 220\ 000$ tonnes.</p> <p>The expected range of realized harvest rate (HR) following the management plan (HR_{mgt}) is between 0.15 and 0.27 (ICES, 2021a).</p>
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44 https://ices-library.figshare.com/articles/report/Cod_Gadus_morhua_in_Division_5_a_Iceland_grounds_/19447886?backTo=/collections/ICES_Advice_2022/5796935

Taking the TAC midway between the current estimate and the previous TAC is a stabilizer. However, according to MFRI⁴⁵, in simulations for evaluating the rule, the catch stabilizer has not been applied if $SSB < B_{trigger}$, while ICES at present applies the stabilizer at all levels of SSB. In practical management, this situation has never occurred since the rule was adopted, and the probability of reaching $B_{trigger}$ is estimated to be small.

The standard reference points were revised in 2021 and are tabulated below (Table 5). Since the harvest rule uses harvest rate (HR) rather than fishing mortality, the exploitation rate reference points are expressed as HR. There probably was a regime shift around 1985, with a recruitment reduction of about 35%. The lowest observed SSB (Bloss) that occurred after the shift (in 1993) is taken as B_{lim} . The precautionary reference points are derived from $B_{lim} = 125\text{kt}$: B_{pa} is the 95 percentiles of B_{lim} , assuming a CV of 0.15. A precautionary value for HR ($HR_{pa} = 0.39$) is the value leading above B_{lim} with 95% probability, applying that HR with a reduction below a trigger at 265kt.

The HR leading to MSY is estimated at 0.22 when taking assessment uncertainty into account, which is slightly above the value in the harvest rule. A MSY $B_{trigger} = 265\text{kt}$ is set at the 5-percentile of the SSB when fishing at $HR_{MSY} = 0.22$ and ignoring the stabilizer in the harvest rule. A limit HR is left undefined, as it would be below the HR_{pa} if following standard practise.

None of these reference points are used directly in the harvest rule, but the rule is regarded as precautionary as it leads to a less than 5% probability of bringing SSB below $B_{trigger}$, which is far above B_{lim} .

The choice of the management $B_{trigger}$ at 220 000 tonnes has a complex background. The 220 000 tonnes was the point estimate of SSB in 2009 when the current harvest rule was introduced. At that time the objective was to ensure that SSB would increase from there by 2015 with high probability. Since then, the value has been kept, with various justifications. The breakpoint in the stock recruitment relation was estimated in 2009 as 220kt, when the regime shift was not taken into account. More recent estimates of the breakpoint are quite variable, but lower.

Table 5. Current values for reference points.

Nálgun <i>Framework</i>	Viðmiðunarmörk <i>Reference point</i>	Gildi <i>Value</i>	Grunnur <i>Basis</i>
Aflaregla <i>Management plan</i>	MGT $B_{trigger}$	220 000 t	5. hundraðshlutamark dreifingar hrygningarstofns þegar aflareglu er fylgt <i>The fifth percentile on the distribution of SSB when the TAC is based on HR_{MGT}</i>
	HR_{MGT}	0.2	Prósenta af viðmiðunarstofni. Leiðir til langtíma hámarksafurkastur <i>Percentage of age 4+ biomass. Leads to long-term MSY</i>
Hámarksafurkastur <i>MSY approach</i>	MSY $B_{trigger}$	265 000 t	Aðgerðarmörk í aflareglu sem standast MSY viðmið ICES <i>Trigger point in HCR considered consistent with ICES MSY framework</i>
	HR_{MSY}	0.22	Slembireikningar í aflaregluhermun. Prósenta af viðmiðunarstofni <i>Stochastic HCR evaluation. Percentage of age 4+ biomass</i>
Varúðarnálgun <i>Precautionary approach</i>	B_{lim}	125 000 t	B_{loss}
	B_{pa}	160 000 t	$B_{pa} = B_{lim} \times \exp(1.645\sigma_B)$; $\sigma_B = 0.15$
	HR_{pa}	0.39	Hámarksveiðihlutfall sem leiðir til þess að 95% líkur eru að stofninn haldist fyrir ofan B_{lim} ef að $B_{trigger}$ er 265 000 t byggt á viðmiðum ICES <i>HR leading to $P(SSB > B_{lim}) > 95\%$ with $B_{trigger} = 265\,000\text{ t}$</i>

45 Communicated at web meeting with MFRI. Nov. 4, 2021

7.3 Landings update

The Cod Fishery

Cod is fished with the whole range of gears, but bottom trawl accounts for about ½ of the catches and long-lines for about 1/4 (Figure 8). The proportion taken with long-line increased in the first decade of the 21st century but has decreased slightly since about 2015⁴⁶.

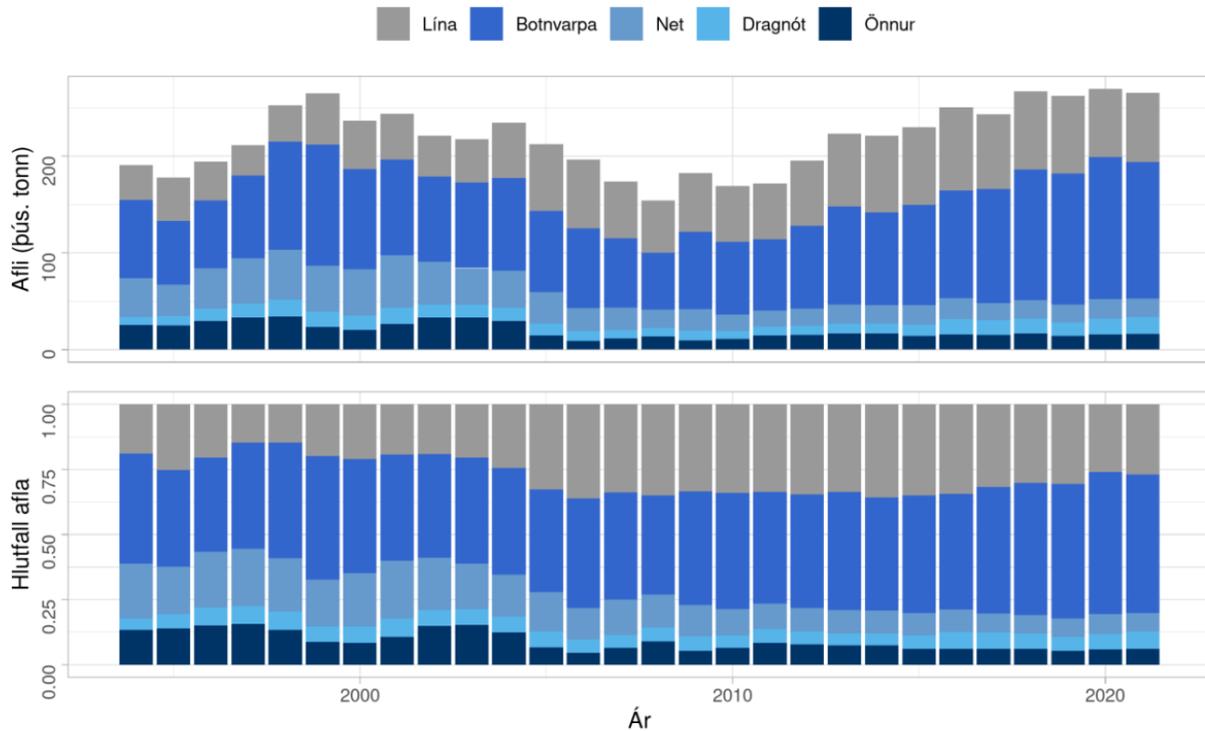


Figure 8. Total catch (landings – upper panel) and percentage of catch (lower panel) by fishing gear since 1994, according to statistics from the Directorate of Fisheries.

Cod is caught all around Iceland, but the highest concentration of catches is on the shelf edge in the North-West, where trawl dominates (Figure 9). The spatial distribution of the recent catches based on logbook records show that the bottom-trawl catches are to a large extent confined to outer continental shelf area in the northwest and southeast (400–500 m) while the longline catches are more dispersed on the shelf proper. The distribution of the gillnet and Danish seine fisheries is primarily in shallow waters in the south and the western waters.

⁴⁶ https://www.hafogvatn.is/static/extras/images/01-cod_tr_isl1327139.pdf

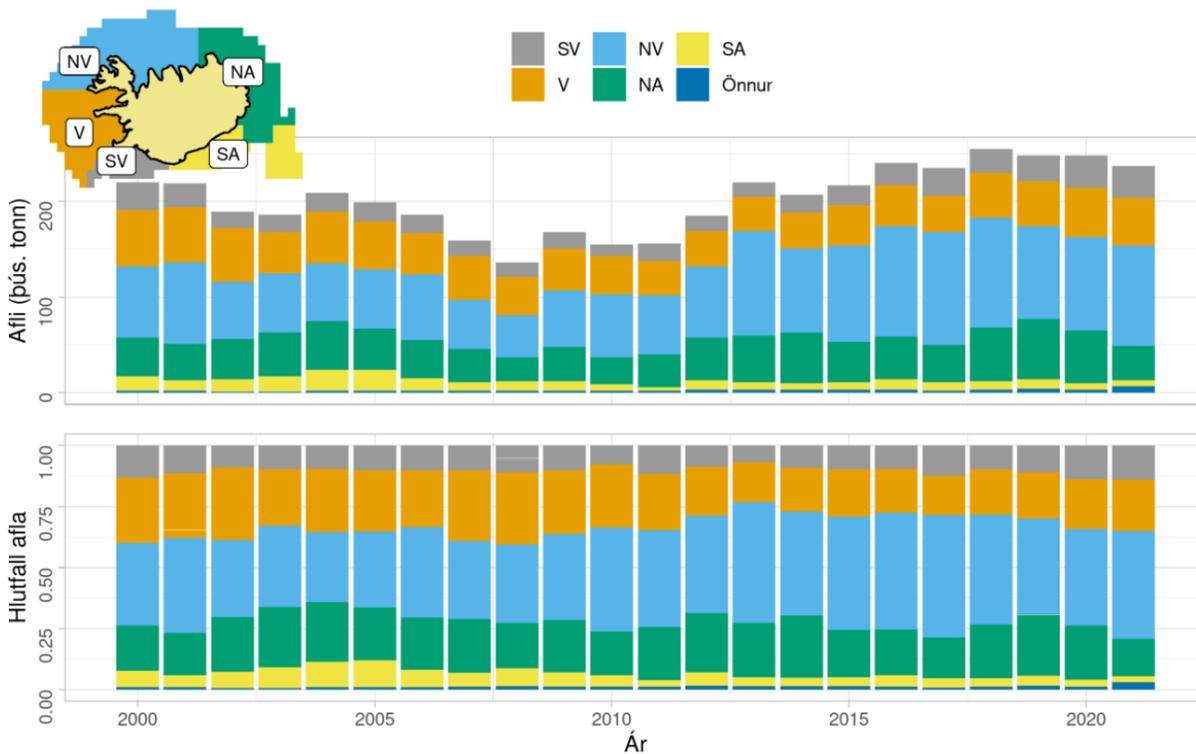


Figure 9. Spatial distribution of landings

Trends in landings

Landings since 1905 are shown in Figure 10. Foreign vessels have been active in Icelandic waters for several hundred years. Icelandic attempts to control foreigners fishing around Iceland sometimes lead to violent conflicts. The last conflict was the 'cod war' with Britain 1975-76. The 200 nautical mile limit that was established in 1975 became internationally adopted during the 1982 UN Convention on the Law of the Sea (UNCLOS). After that, catches by foreign fleets in Iceland waters have been minor and according to bilateral agreements. Catches increased gradually throughout the 20th century until WW2, and then peaked again around 1950. Catches were at a high level after the introduction of the 200 nm zone, but then decreased until about 1995. Various harvest rules have been in effect since the mid 1990s, leading to a gradual reduction in fishing mortality. After 1983, there has been a reduced recruitment, interpreted as a regime shift. The development of the present type of harvest rule started in 2004. The present rule that was implemented in 2009 led to a harvest rate not far from the target of 0.2. The stock has increased markedly after that, and the management is generally well accepted by the industry.

The recent landings have increased gradually with the increase in stock abundance. In the near future, the landings are expected to go somewhat down, due to some poorer year classes dominating the fishable stock. More recent year classes appear better again.

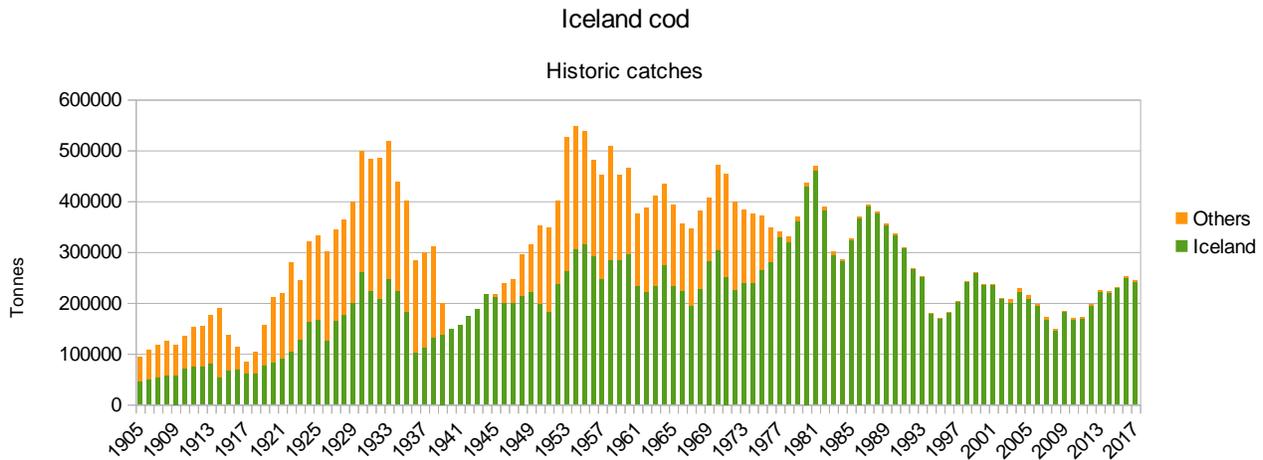


Figure 10. Historical landings of cod.

Adherence to the advice, quotas and catches are shown in Table 6 and Figure 11. For the last decade, both before and after the introduction of the harvest rule in 2017, quotas have been set according to the scientific advice with minor exceptions. Since the introduction of the HCR in the fishing year 2017– 2018, the scientific advice has been according to the rule. The Icelandic TAC is set equal to the recommended TAC without taking the expected catch by other nations (Faroes and Norway) into account.

The actual catch has exceeded the TAC in most years, up to about 10% above the recommended. A likely partial cause is transfers between years (Figure 11). Transfer between species is not a likely cause: a cod quota can be used to cover catches of other species (negative transfers) but cod catches cannot be covered by quotas from other species. Some deviations are due to catches by other nations that are not considered when setting national quotas.

Table 6. Recommended TAC, quotas and reported catches for Icelandic cod ⁴⁷.

Fiskveiðíár <i>Fishing year</i>	Tillaga ¹⁾ <i>Recommended TAC¹⁾</i>	Aflamark <i>National TAC</i>	Afli Íslendinga <i>Catches Iceland</i>	Afli annarra þjóða <i>Catches others</i>	Afli alls <i>Total catch</i>
2010/2011	160 000	160 000	164 891	2 309	167 200
2011/2012	177 000	177 000	182 646	2 247	184 889
2012/2013	196 000	195 000	210 489	2 011	212 500
2013/2014	215 000	215 000	223 977	2 183	226 160
2014/2015	218 000	218 000	221 069	1 967	223 036
2015/2016	239 000	239 000	249 945	2 343	252 228
2016/2017	244 000	244 000	234 657	3 006	237 663
2017/2018	257 572	257 572	267 140	3 249	270 389
2018/2019	264 437	264 437	262 893	3 308	265 976
2019/2020	272 411	272 411	269 327	2 784	272 111
2020/2021	256 593	256 593	269 413	2 725	272 138
2021/2022	222 373	222 373			
2022/2023	208 846				

¹⁾ 20 % aflaregla – 20% harvest control rule.

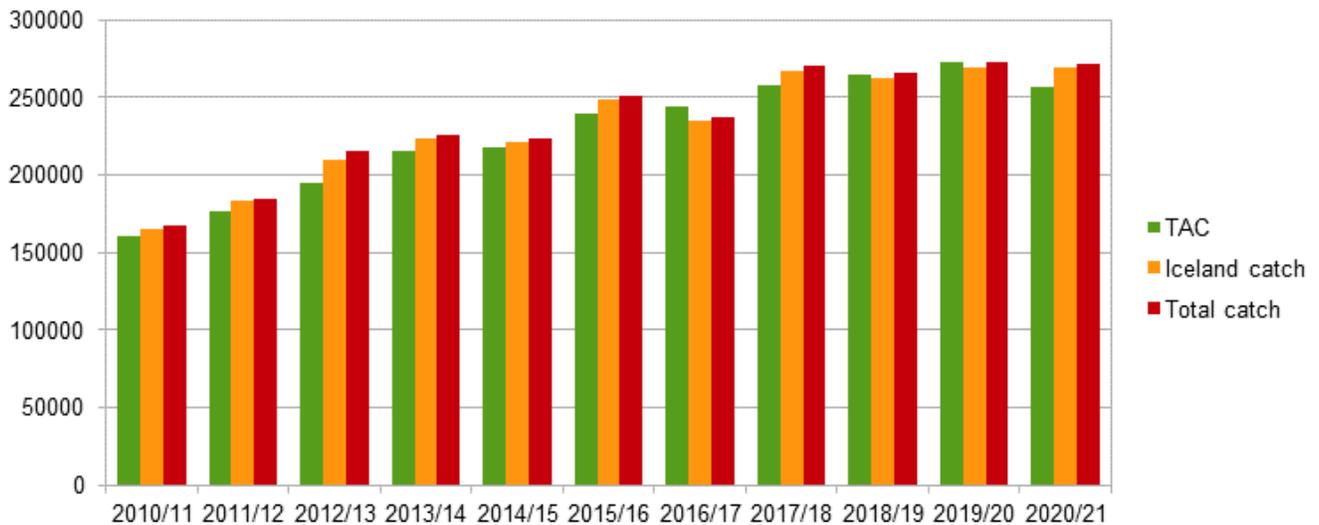


Figure 11. Quotas and catches (data from Table 6).

⁴⁷ https://www.hafogvatn.is/static/extras/images/01-cod_tr_isl1327139.pdf

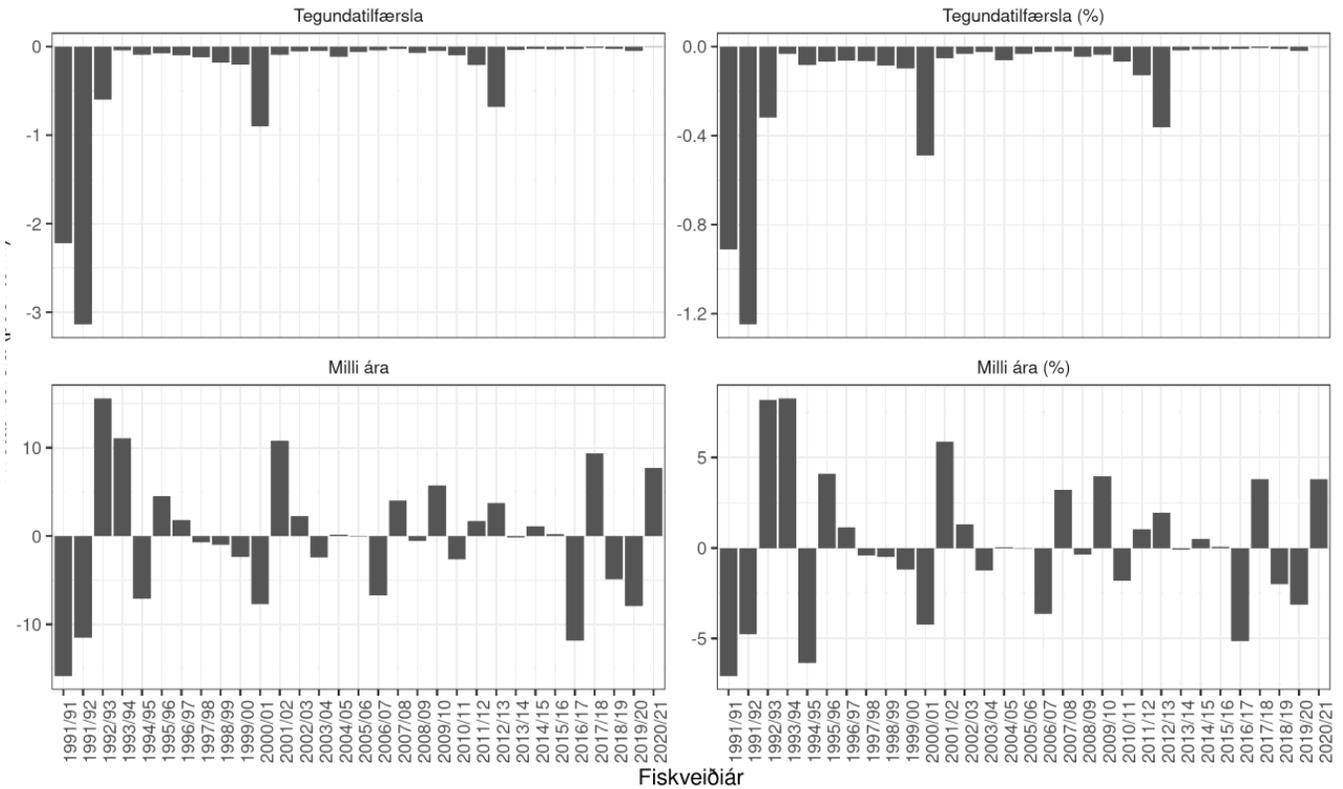


Figure 12. Net transfers of quota to and from cod in the Icelandic ITQ system by quota year. Between species (upper): Positive values indicate a transfer of other species to cod (not allowed), but negative values indicate a transfer of cod quota to other species. Between years (lower): Net transfer of quota for a given quota year.

7.4 Enforcement and Compliance update

The Icelandic Directorate of Fisheries is an independent administrative body responsible to the Fisheries Minister, responsible for the day to day implementation of the Act on Fisheries Management and related legislation, for day-to-day management of fisheries and for supervising the enforcement of fisheries management rules. More specifically, the Directorate of Fisheries works in accordance with the following Acts, the Directorate of Fisheries Act (no. 36/1992)⁴⁸, the Fisheries Management Act (no. 116/2006)⁴⁹, 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 catches⁵⁰. 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 <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2021/09/23/Stjorn-fiskveida-2021-2022-Log-og-reglugerdir/>.

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 1996⁵¹). Provisions of the Act on a Special Fee for Illegal Marine Catch⁵² are also applied as appropriate. Penalties range from the issue of reprimands by the Directorate of Fisheries and the suspension of commercial fishing permits to fines and, in cases of serious or repeated deliberate violation, imprisonment for up to six years (Article 24 and 25 of Act No. 116/2006).

Control of discarding of fish is provided for by the Treatment of Commercial Marine Stocks Act No. 57 1996, which prohibits discarding and fishing without sufficient quota. The Act requires the Directorate of Fisheries to monitor and publish information on catches of the fleet (Articles 2-3). Furthermore, the Act stipulates that all fish caught within the Icelandic EEZ, or during trips where a proportion of fishing activities take place in the EEZ, must be landed in an officially recognised port. Fiskistofa also performs check at sea to check for differences in catches of certain vessels when the Fiskistofa inspector is on board and when not, to detect discards. Some findings have been published in 2019⁵³ and 2020⁵⁴.

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,

⁴⁸ <https://www.althingi.is/lagas/149a/1992036.html>

⁴⁹ <https://www.ecolex.org/details/legislation/fisheries-management-act-1990-lex-faoc003455/>

⁵⁰ <http://www.fiskistofa.is/english/about-the-directorate/>

⁵¹ <https://www.althingi.is/lagas/149a/1996057.html>

⁵² <https://www.althingi.is/lagas/149a/1992037.html>

⁵³ <http://www.fiskistofa.is/umfiskistofu/frettir/aflasamsetning-a-botnvorpu-og-dragnotarveidum>

⁵⁴ <http://www.fiskistofa.is/umfiskistofu/frettir/aflasamsetning-i-thorskanetum-og-botnvorpu>

1996 concerning the Treatment of Commercial Stocks, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources⁵⁵.

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. Starting from September 2020 smaller Icelandic vessels are required to log their catches in an App (essentially an e-logbook) which contains information on catch and bycatch, including that of marine mammals and seabirds. This follows regulation 298/2020⁵⁶. The App also called Afladagbókina or catch diary^{57 58} 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. More information on this topic has been provided as part of minor Non Conformance #1 progress update (Section 8 of this report).

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

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

A December 2018 report from the Icelandic National Audit Office (NAO)⁵⁹ 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 2022 audit, Fiskistofa confirmed that they worked on this issue by increasing surveillance. Two incidents were registered in 2022. The results of this surveillance are published online to show the violations and deter other potential violators⁶⁰.

⁵⁵ <https://www.stjornartidindi.is/Advert.aspx?RecordID=884be309-64a5-4367-9e4d-f5e7216b6f40>

⁵⁶ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

⁵⁷ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

⁵⁸ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

⁵⁹ <https://rikisendurskodun.is/wp-content/uploads/2019/01/Eftirlit-Fiskistofu-Stjornsysluuttek.pdf>

⁶⁰ <https://island.is/s/fiskistofa/frett/birting-ishlutfalls-vid-endurvigtun-undir-eftirliti>

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 990/2020⁶¹ 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.

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 Fisheries⁶².

Acts/Laws and Regulations may be accessed by searching by Act/Law/Regulation No./Year (e.g. 116/2006) at <http://www.althingi.is/lagasafn/> (for Acts/Laws) or <https://www.reglugerd.is/> (for Regulations). In addition to their being easily accessible and searchable online laws and regulations are also effectively disseminated through an online law gazette which provides the most up to date versions of the legislation (i.e. incorporates latest amendments)⁶³.

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.⁶⁴

All scientific advice is available online⁶⁵. Harvest control rules are scrutinised on request by an independent scientific body (ICES) with reports being published online.

Up-to-date maps of fisheries closures are available on-line on the Fisheries Directorate website⁶⁶.

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

⁶¹ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/22140>

⁶² http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

⁶³ <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2021/09/23/Stjorn-fiskveida-2021-2022-Log-og-reglugerdir/>

⁶⁴ <http://www.fiskistofa.is/>

⁶⁵ <https://www.ices.dk/advice/Pages/Latest-Advice.aspx>

⁶⁶ <http://atlas.lmi.is/mapview/?application=haf>

Table 7. Short term closures in Iceland for the years 2018-2022.

Year	Species	Number of closures
2018	Cod	90
2018	Saithe	4
2018	Shrimp	2
2018	Haddock	1
2019	Cod	50
2019	Haddock	1
2020	Cod	9
2020	Haddock	1
2020	Greenland halibut	1
2021	Sea cucumber	2
2021	Cod	3
2021	Haddock	1
2022	Cod	2
2022	Haddock	2
2022	Sea cucumber (quota finished)	1

Directorate Inspections at Sea

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

Table 8. Directorate inspector days on fishing vessels (Source: Fiskistofa, October 2022 on-site audit).

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

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

7.4.1 Enforcement by Fiskistofa

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

Table 9. Fiskistofa suspected violations in 2020 and 2021. Source: Fiskistofa 2020⁶⁷ and 2021 Annual Report⁶⁸. Note, the information between 2020 and 2021 is not directly comparable, and offenses of a similar nature may have been combined into one case.

Suspected violation	2020 No.	2021 No.
Veiðar án leyfis / Fishing without a permit	14	1
Brottkast / offences	11	70
Vigtun afla / weighing of catch	24	2
Þar af vigtun vigtarleyfishafa / of which the weighing by the weighing licensee	9	3
Framhjálföldun / landing	6	1
Afladagbók / logbook	40	91
Vanskil afladagbókar / submitting logbook late	470	
Veiðar án aflaheimilda / Fishing with insufficient catch quotas	6	1
Mál vegna umframafla / Cases due to excess catch * mostly daily allowance in coastal vessels	1321	1456
Lax og silungsveiði / salmon and trout fishing	24	13
Undirmálsfiskur / bottom fish fishing	4	11
Röng tilgreining tegunda / Incorrect identification of species	3	3
Grásleppuveiðar / Lumpsucker fishing	13	2
Strandveiðar / coastal fishing	42	2
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	16

7.4.2 Enforcement by the Icelandic Coast Guard

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

⁶⁷ https://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

⁶⁸ <https://www.fiskistofa.is/media/arsskyrslur/arsskyrsla-2021.pdf>

During the remote audit in October 2022 the ICG reported that surveillance in 2020 and 2021 and 2022 was challenging due to the COVID 19 pandemic. By beginning of March 2020, severe restrictions on direct interactions between people were imposed. This restricted surveillance possibilities on board vessels for Maritime Surveillance and Control agency such as the Icelandic Coast Guard. All restrictions were lifted by February 25th 2022.

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

In spite of the Coast Guard efforts the pandemic has had its impact. Fewer inspections and boardings of vessels resulted in less measuring of fish, which was reflected in fewer Short Time Closures in 2020 and 2021 and 2022 (see Table 7) and none based on Fisheries inspections by ICG. The overall number of inspections since 2012 is shown below.



Figure 13. Overall number of ICG inspection from 2012 to 2022. Source: ICG, November 2022.

Instead of regular boardings the ICS used more surveillance drones, in partnership with Fiskistofa. Trials with a bigger drone from EMSA (type Schiebel S 100 Camcopter, Figure below) proved to be a lesson for future use of larger drones operating from a vessel. The trials with the EMSA drone tied up, in part, the activities of the vessels which can in part explain fewer boardings. However, the drones are an extension of the vessel and information is used to inspect vessels more selectively than doing random checks. In the summer of 2022 the ICG recorded several incidents of inspections after anomalies were spotted by the drone crews. These include registry of crew but also discard of fish. Air Surveillance hours by RPAS (drone) between May 31st until August 31st 2022 are shown below.

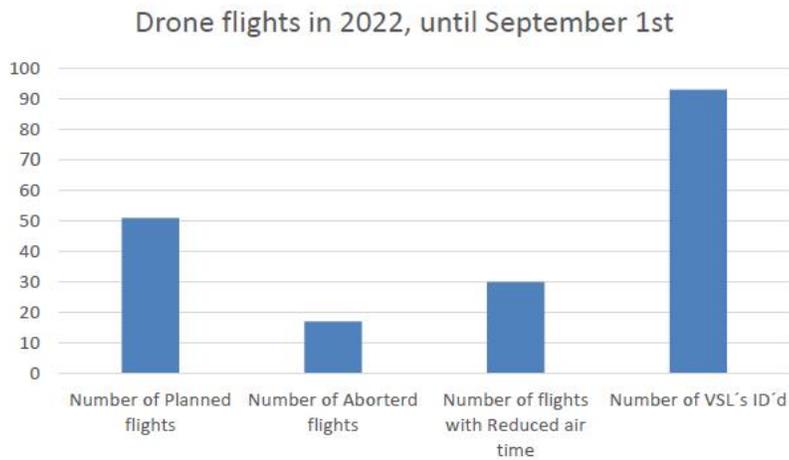


Figure 14. Air Surveillance hours by RPAS (drone) between May 31st until August 31st 2022.

In terms of overall infringements, 11 reports of apparent infringements were reported in 2022, 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 2022, included: Lögskráningar /Crew registry, Réttindi /License, Veiðar /Fisheries, Veiðileyfi /Fishing permit, Ferilvöktun /Vessel monitoring, Farþegafjöldi /Passengers, Haffæri /Sea worthiness and a new addition För yfir landamæri /Border Control. These are shown below (until the 1st September 2022) compared to historical data up to 2017.

Kæruskýrslur, brotaflokkar 2017-2022 (til enda Sept)

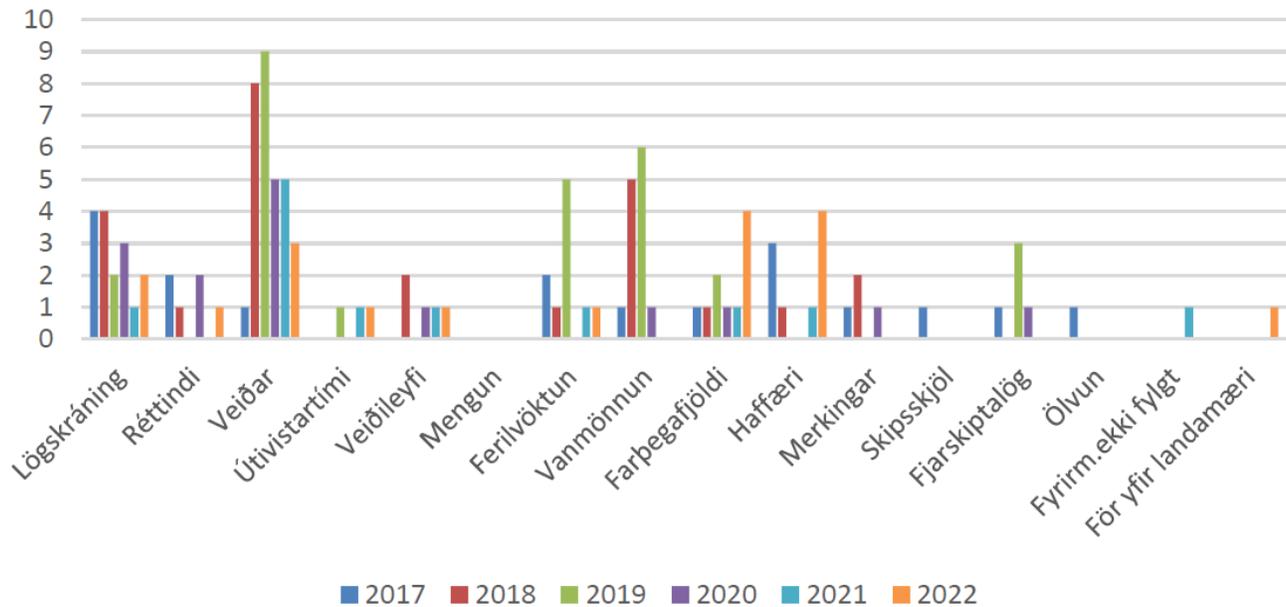


Figure 15. Overview of ICG infringement reports in 2017- (1st September) 2022. Source: provided by the ICG on the 8th of November 2022.

For 2022, infringements on Passenger and Sea Worthiness are most common 4 each, Fishing is next with 3 Apparent Infringements. No apparent infringement were reported in 2022 in the following categories; Mengun /Pollution, Vanmönnum /Manning, Merkingar /Markings, Skipsskjöl /Ships documents, Fjarskiptalög /Communications, Fyrirm.ekki fylgt /Instructions not obeyed or Ölvun /intoxication.

Foreign vessels inspection 2022

Eight foreign flag vessels inspected in 2022, one Faroese longliner, six Norwegian Capelin vessel, and another Capelin vessel from Greenland, all in the Icelandic EEZ. No infractions were reported.

7.5 Bycatch, habitat and ecosystem update

7.5.1.1 Bycatch and associated species

Associated species catch and bycatch to the fishery

The Icelandic groundfish fishery is multispecies in nature with vessels simultaneously targeting numerous species. With regards to catches, most commercially fished species in Iceland are now part of the ITQ system. Discarding is prohibited and comparison between observer measured catch compositions and self-reporting by fishers ensures that a high level of compliance with the ban on discarding is maintained. The species listed below are those that were identified during the 2019-2020 re-assessment⁶⁹. A status update on each of these species is provided below but in summary the cod fishery appears not to have any significant negative effects on any of the listed species but one, spotted wolffish, which is the subject of an open non-conformance and related corrective action.

Table 10. Status of bycatch and associated species in the cod target and non-target fisheries

Status of bycatch and associated species in the cod target and non-target fisheries as identified during the re-assessment from historic average catches for each relevant gear type. All data and information are derived from the MFRI Advice page⁷⁰ for each individual species.

ÝSA – HADDOCK (*Melanogrammus aeglefinus*)⁷¹

The spawning-stock biomass (SSB) has decreased since 2008, but stabilized above MSY Btrigger in recent years. MFRI and ICES assesses that fishing pressure is above both HRMSY and HRpa and below HRLim; spawning stock size is above MSY Btrigger, Bpa and Blim.

⁶⁹ <https://www.responsiblefisheries.is/media/1/irf-cod-re-assessment-report-final-03feb2020.pdf>

⁷⁰ <https://www.hafogvatn.is/en/harvesting-advice>

⁷¹ <https://www.hafogvatn.is/static/extras/images/02-haddock1325964.pdf>

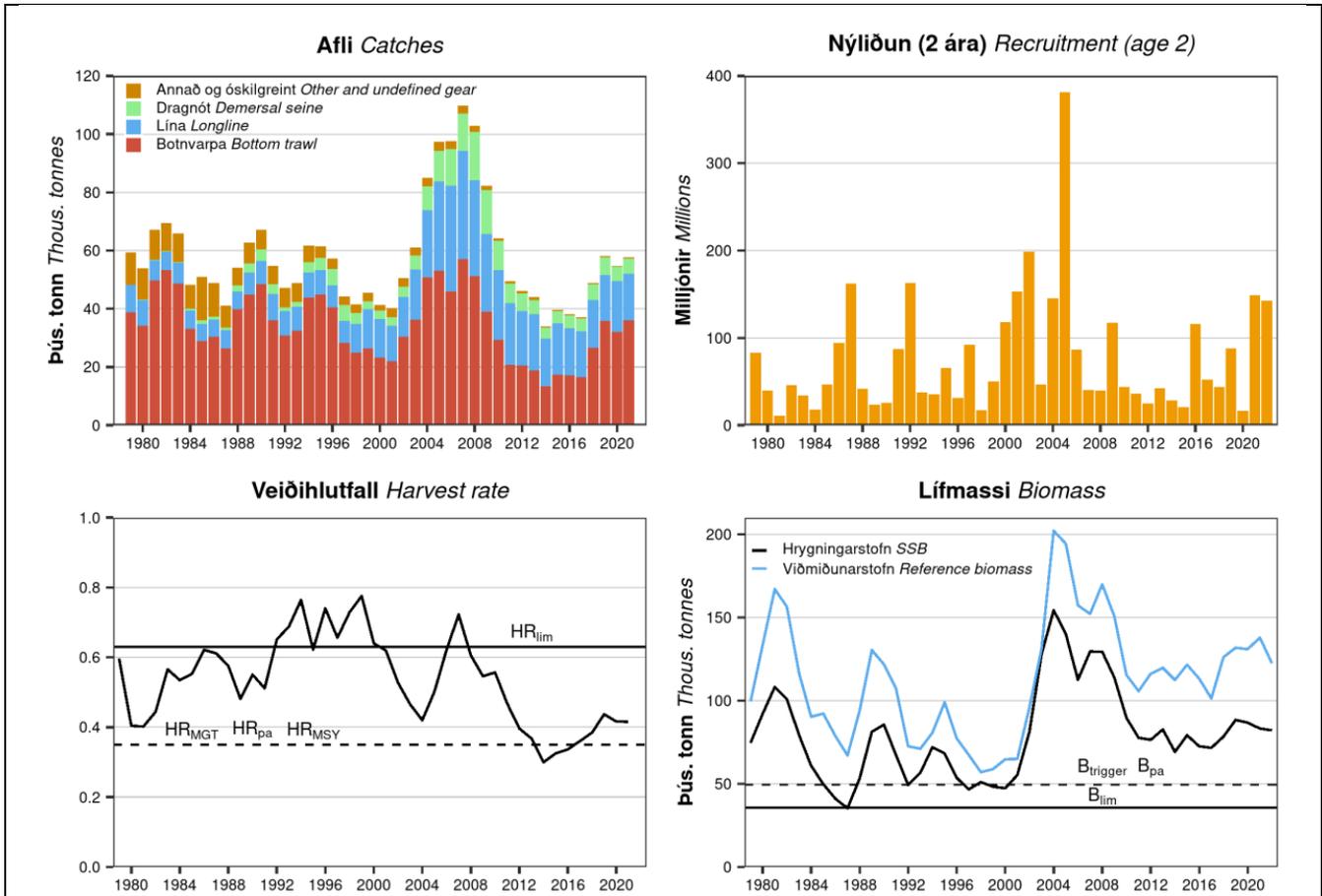


Figure 16. Icelandic haddock harvest rate and biomass.

UFSI – SAITHE (*Pollachius virens*)⁷²

Fishing pressure is above HR_{MGT} and HR_{MSY} but below HR_{pa}, and HR_{lim}; spawning stock size is above MSY B_{trigger}, B_{pa}, and B_{lim} and B_{lim}.

⁷² <https://www.hafogvatn.is/static/extras/images/03-saithe1325968.pdf>

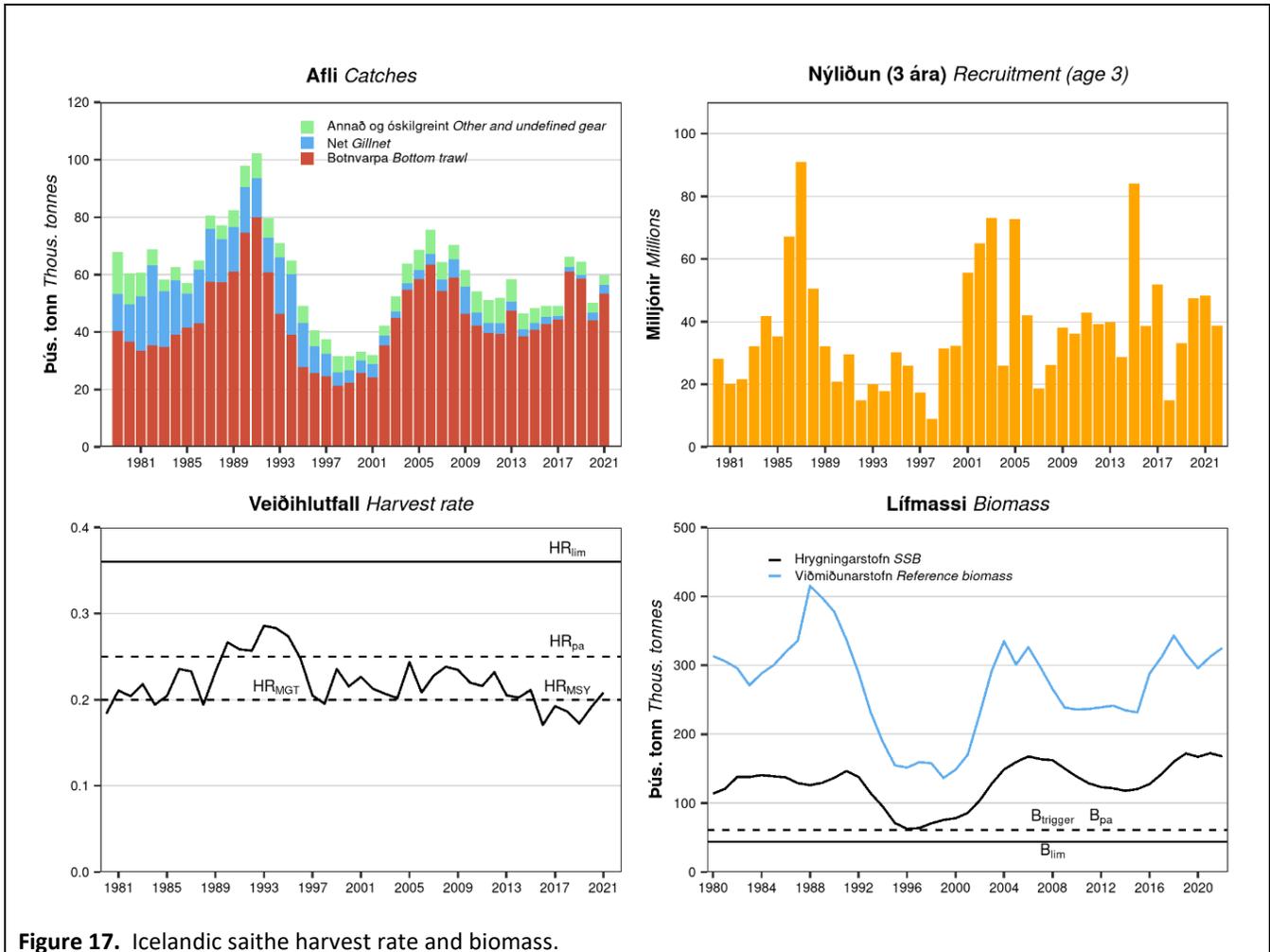


Figure 17. Icelandic saithe harvest rate and biomass.

GULLKARFI – GOLDEN REDFISH (*Sebastes norvegicus*)⁷³

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

⁷³ <https://www.hafogvatn.is/static/extras/images/05-goldenredfish1328558.pdf>

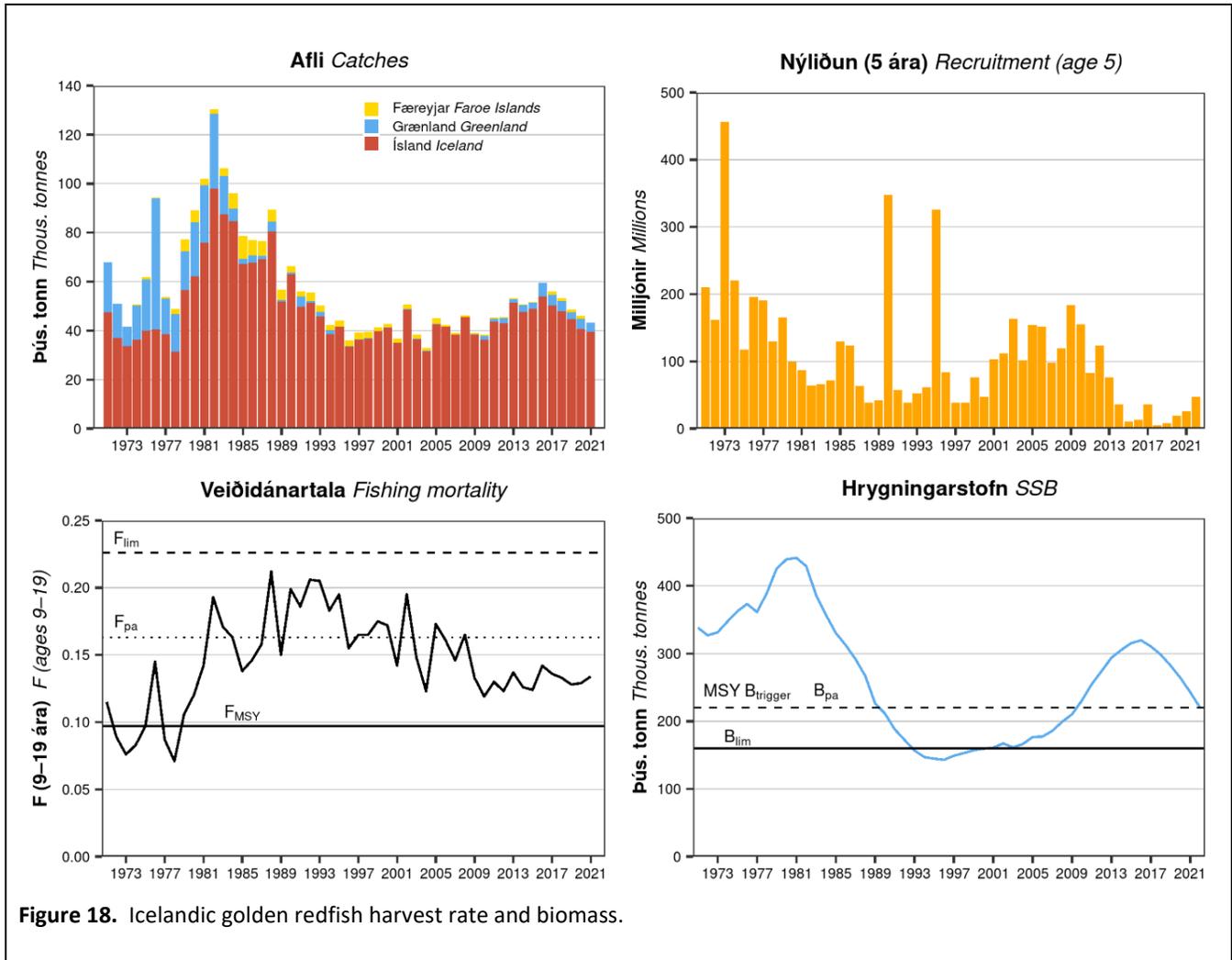


Figure 18. Icelandic golden redfish harvest rate and biomass.

DJÚPKARFI – DEMERSAL BEAKED REDFISH (*Sebastes mentella*)⁷⁴

MFRI and ICES cannot assess the stock and exploitation status relative to maximum sustainable yield (MSY) and precautionary approach (PA) reference points because the reference points are undefined. MFRI and ICES advise that when the precautionary approach is applied, catches in the fishing year 2022/2023 should be no more than 6336 tonnes.

⁷⁴ <https://www.hafogvatn.is/static/extras/images/05-demersalsmentella1325976.pdf>

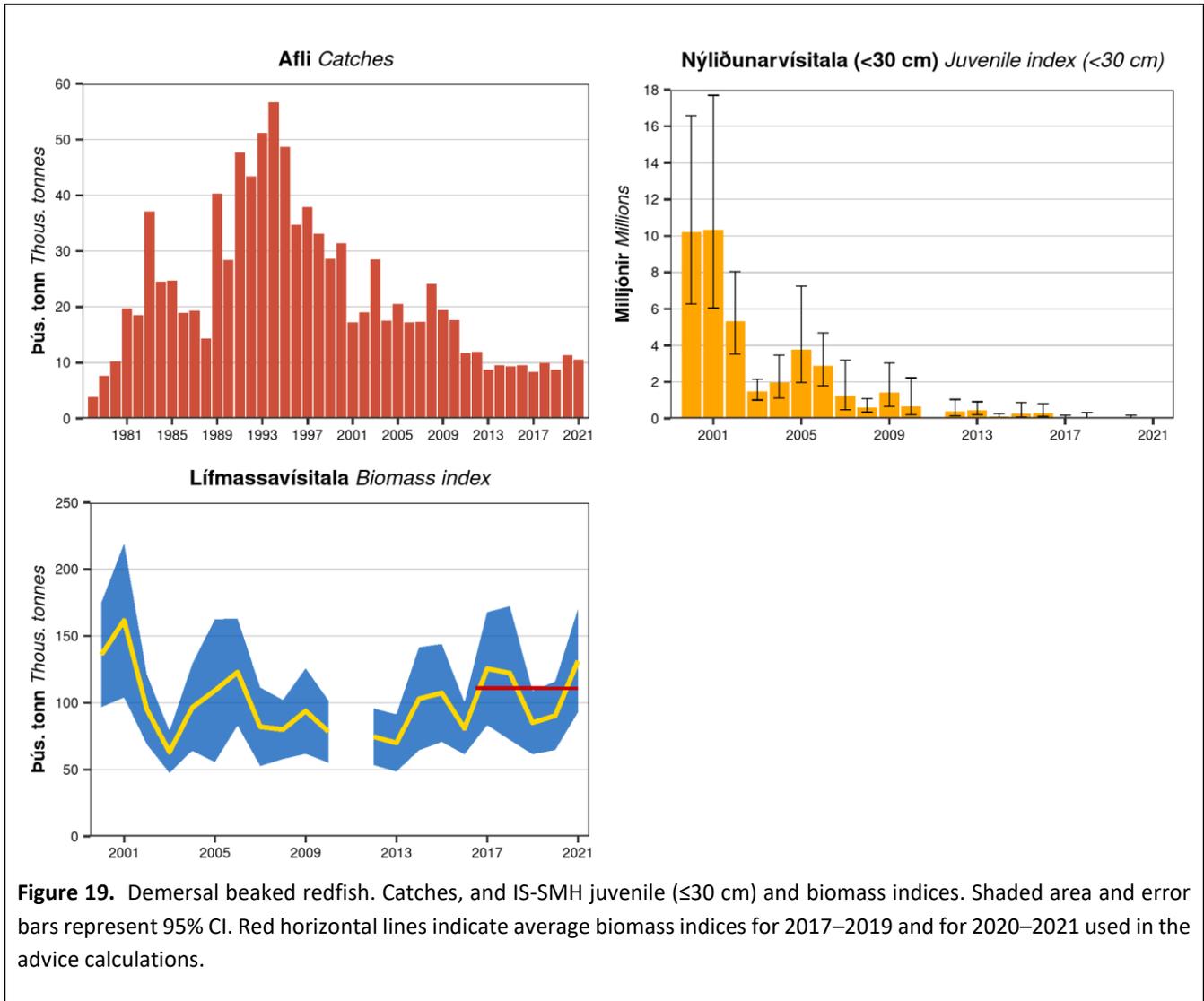


Figure 19. Demersal beaked redfish. Catches, and IS-SMH juvenile (≤ 30 cm) and biomass indices. Shaded area and error bars represent 95% CI. Red horizontal lines indicate average biomass indices for 2017–2019 and for 2020–2021 used in the advice calculations.

GRÁLÚÐA – GREENLAND HALIBUT (*Reinhardtius hippoglossoides*)⁷⁵

MFRI and ICES advise that when the MSY approach is applied, catches in the 2022/2023 fishing year in the East Greenland/Iceland/Faroe Islands area should be no more than 26 710 tonnes. Fishing pressure on the stock is below FMSY and Flim; spawning stock size is above MSY Btrigger and Blim.

⁷⁵ <https://www.hafogvatn.is/static/extras/images/08-greenlandhalibut1325988.pdf>

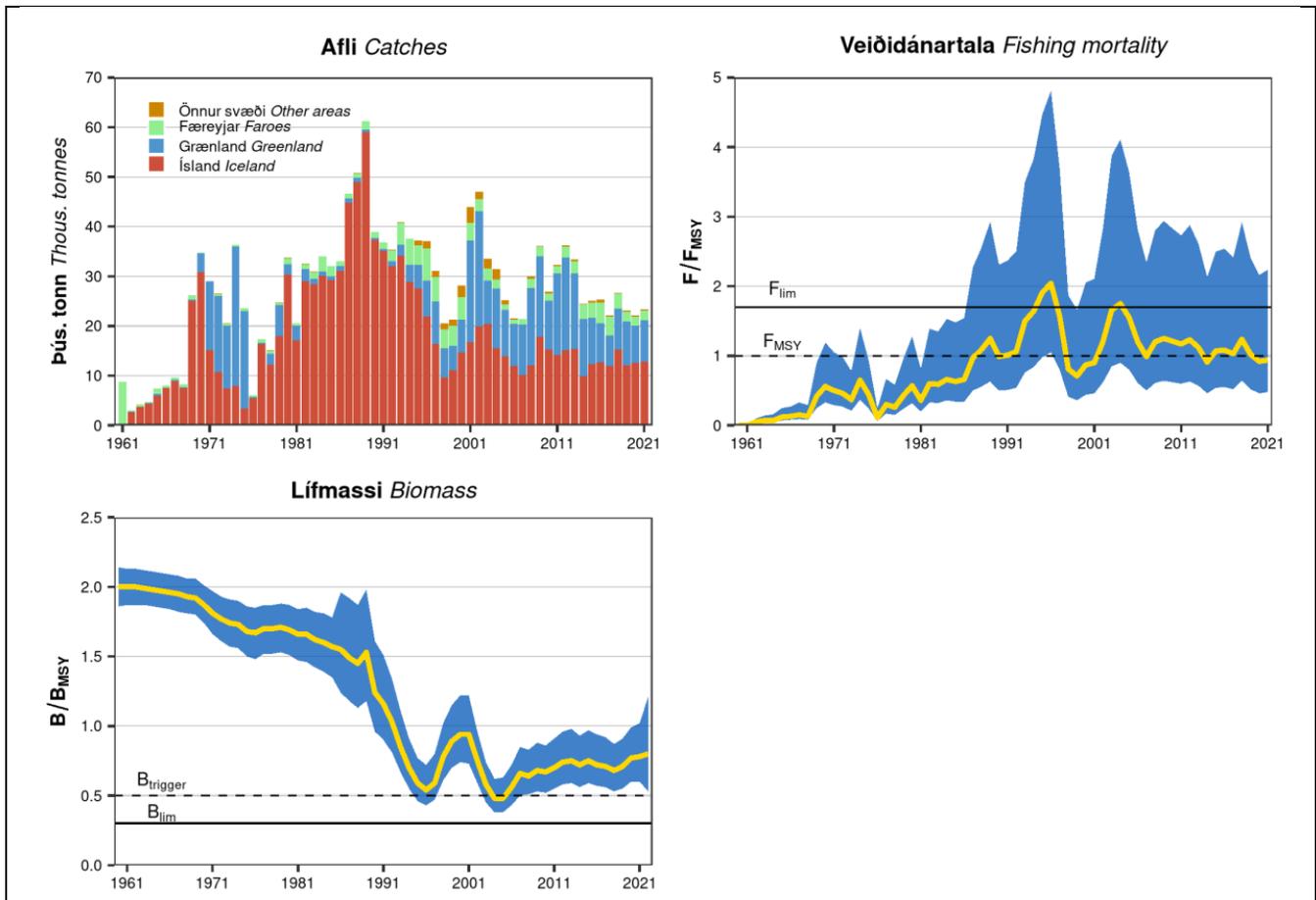


Figure 20. Greenland halibut harvest rate and biomass.

LANGA – LING (*Molva molva*)⁷⁶

MFRI and ICES advises that when the Icelandic management plan is applied, catches in the fishing year 2022/2023 should be no more than 6098 tonnes. Fishing pressure on the stock is above FMGT but below Fpa and Flim; spawning-stock size is above MGT Btrigger, Bpa and Blim.

⁷⁶ <https://www.hafogvatn.is/static/extras/images/17-ling1326026.pdf>

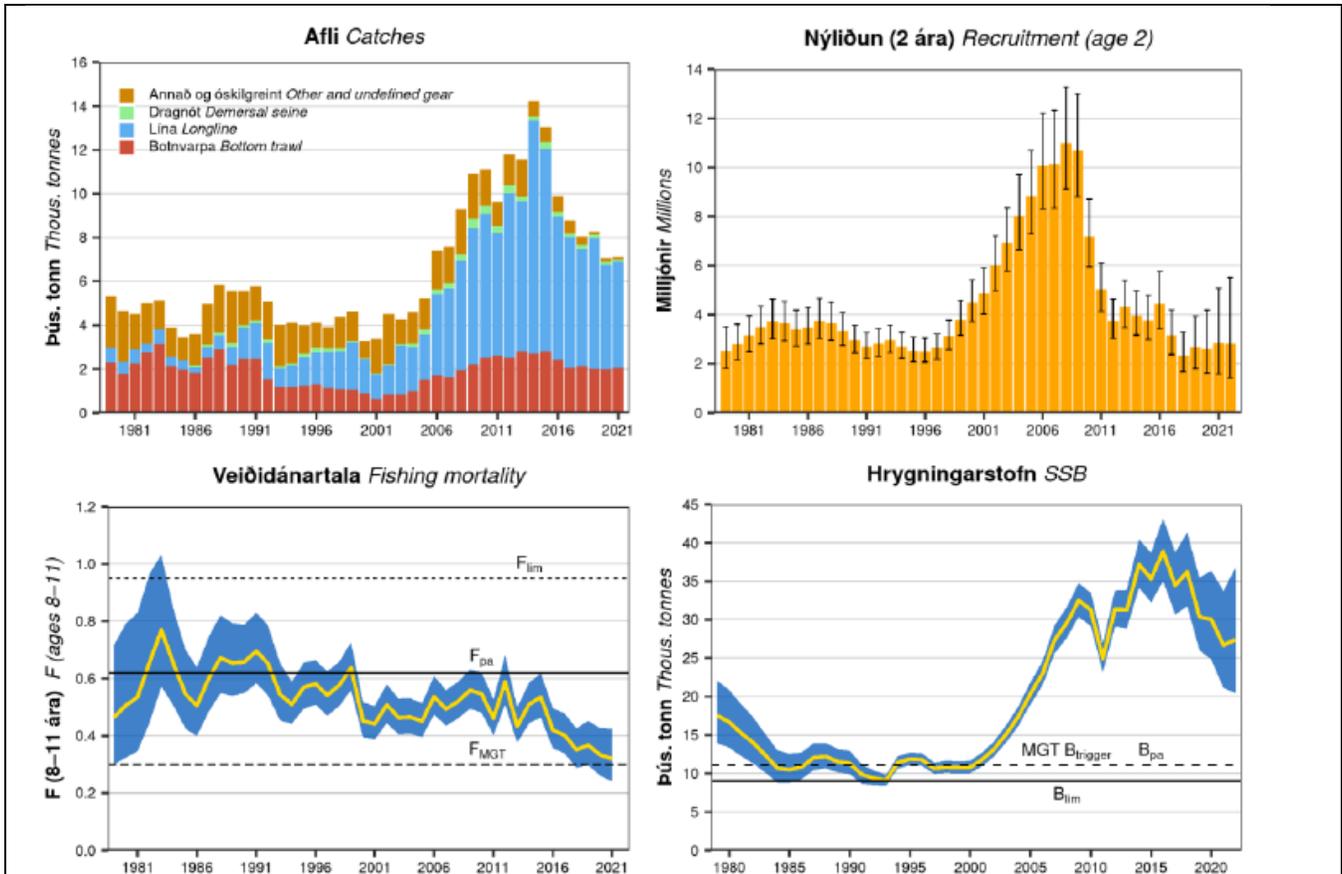


Figure 21. Ling harvest rate and biomass.

TINDASKATA – STARRY RAY (*Amblyraja radiata*)⁷⁷

The MFRI advises that when the precautionary approach is applied, catches in the fishing year 2022/2023 should be no more than 1105 tonnes. The MFRI cannot assess the stock and exploitation status relative to maximum sustainable yield (MSY) and precautionary approach (PA) reference points, because the reference points are undefined. The stock has declined in recent years, but recruitment is stable. Prospects regarding the size of the stock are, therefore, uncertain.

⁷⁷ <https://www.hafogvatn.is/static/extras/images/24-starryray1326054.pdf>

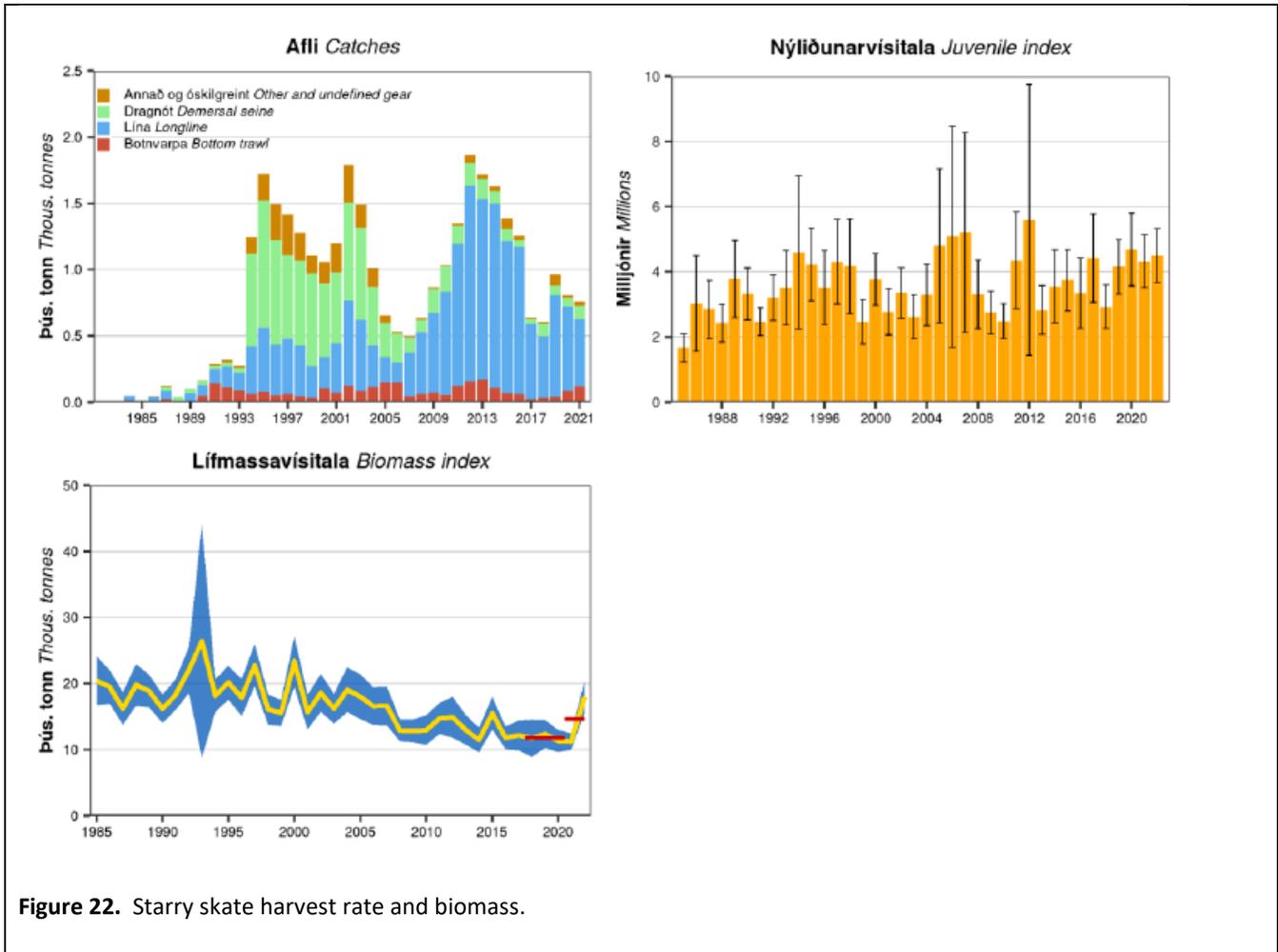


Figure 22. Starry skate harvest rate and biomass.

STEINBÍTUR–ATLANTIC WOLFFISH (*Anarhichas lupus*)⁷⁸

Fishing pressure on the stock is above FMGT, and Fpa but below Flim; spawning-stock size is above MGT Btrigger, Bpa and Blim.

⁷⁸ <https://www.hafogvatn.is/static/extras/images/15-atlanticwolffish1326018.pdf>

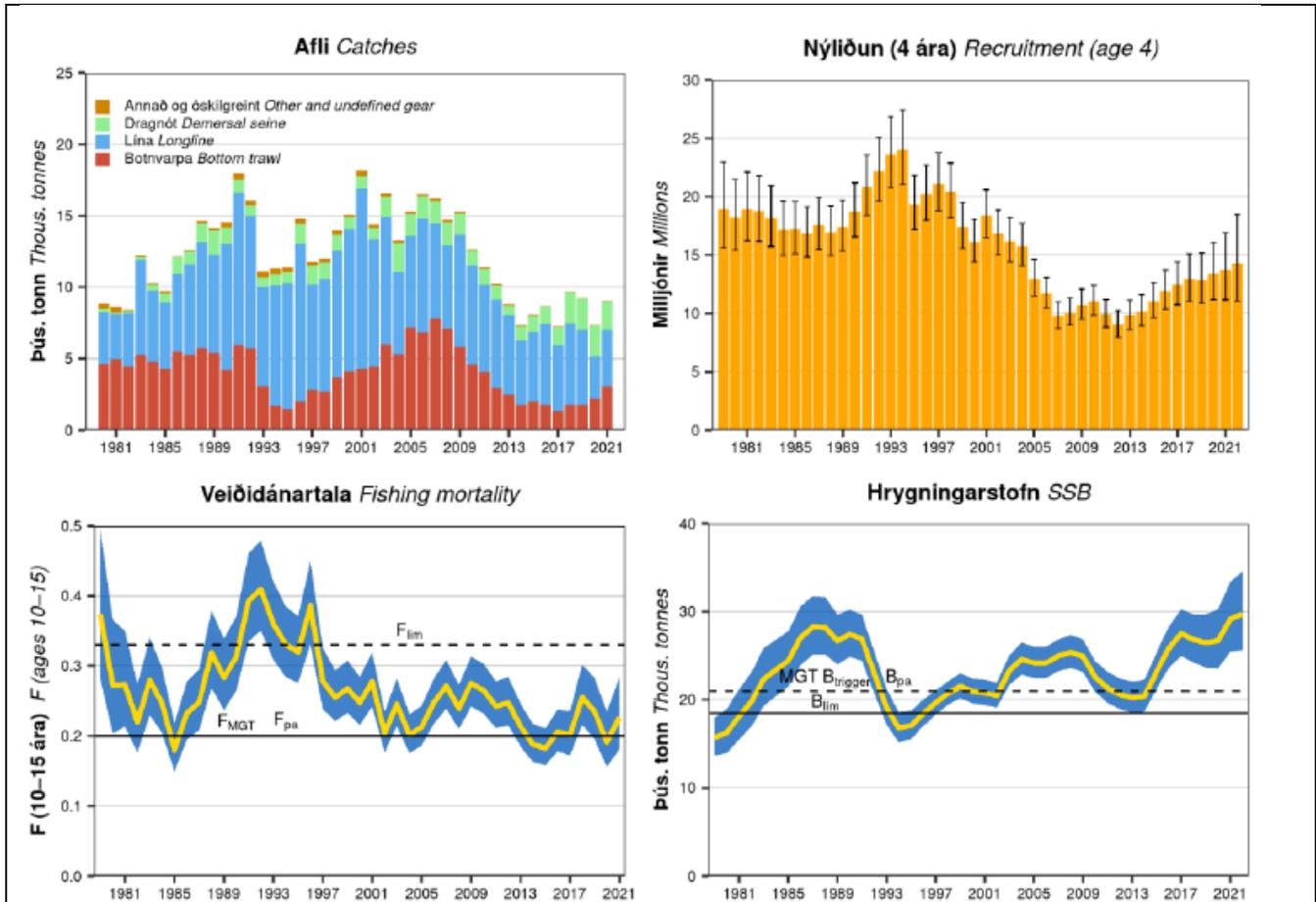


Figure 23. Atlantic wolffish harvest rate and biomass.

HLÝRI – SPOTTED WOLFFISH (*Anarhichas minor*)⁷⁹

Because the stock is depleted and Icelandic catches were consistently above recommended TAC and above TAC in the two most recent fishing seasons (see next table), a minor non-conformance was raised in 2019.

Fiskveiðiár Fishing year	Tillaga Recommended TAC	Aflamark National TAC	Afli Catches
2012/2013	900	-	2 042
2013/2014	900	-	2 250
2014/2015	900	-	1 655
2015/2016	900	-	1 913
2016/2017	1 128	-	1 587
2017/2018	1 080	-	1 528
2018/2019	1 001	1 001	1 383
2019/2020	375	375	1 310
2020/2021	314	314	1 295
2021/2022	377	377	
2022/2023	334		

⁷⁹ <https://www.hafogvatn.is/static/extras/images/16-spottedwolffish1326022.pdf>

NC#2 Clause 3.1.1: There is insufficient evidence that adverse impacts of the cod fishery on the following ecosystem components:

- 1) Spotted wolffish, and;
- 2) Common loon

are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.

Updates and corrective actions are shown below.

The stock is at a critical stage as the biomass and juvenile indices have decreased year on year and are now at historical low levels. The stock is considered to be below any candidate biomass reference points. Therefore, the advised catch levels are expected to decline in the proceeding years, or potentially a landing ban of spotted wolffish could be advised if the level of fishing mortality is not reduced to values sufficient to reverse the downward trend. As spotted wolffish are mainly caught as bycatch, catches have been above recommendations, and biomass indices are now at historically low levels, fishermen are now allowed (since 2021) to release spotted wolffish caught beyond set TAC, due to its high post capture survival.

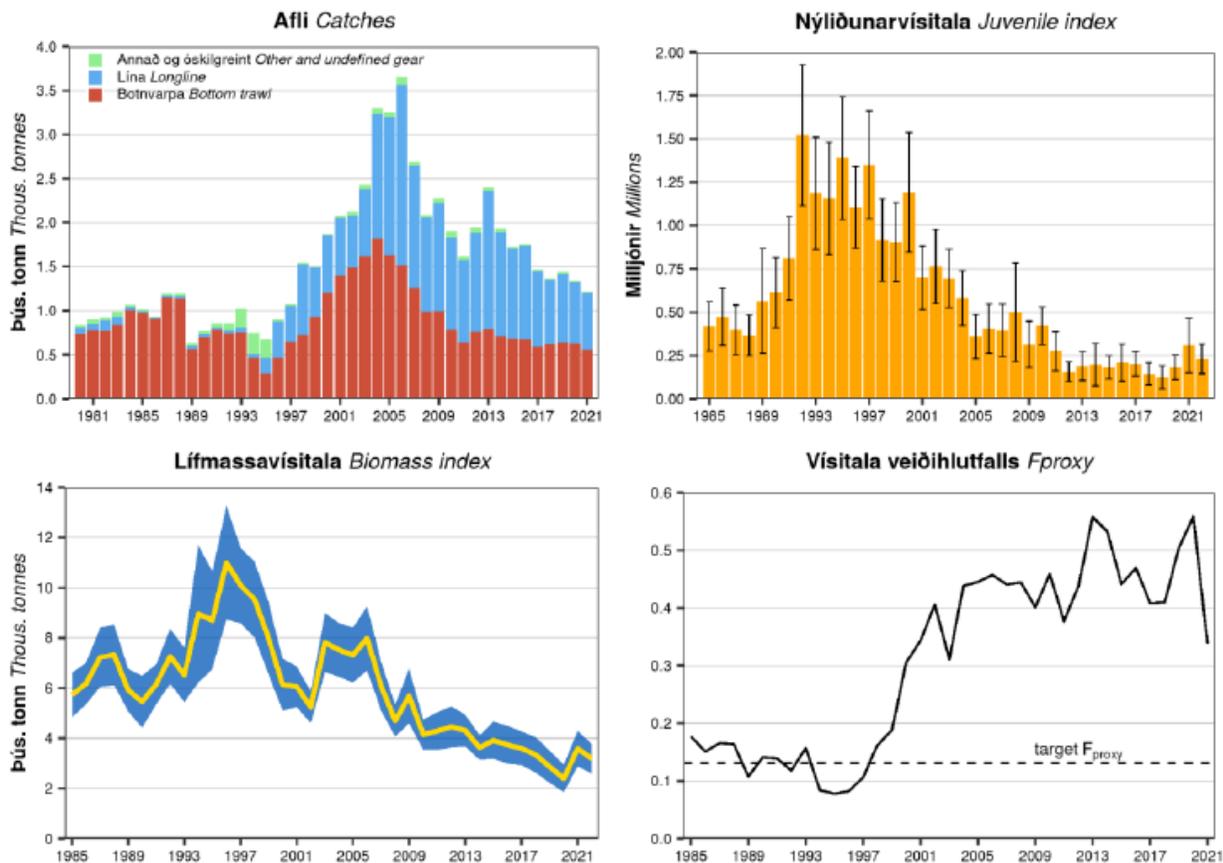


Figure 24. Spotted wolffish catches, juveniles index, harvest rate and biomass.

Additional management measures have been implemented for this stock in 2020. The MFRI believes that there is a strong need to protect the stock. Studies in Canada show that wolffish is generally fairly robust and can survive capture by trawls.

For example, Grant and Hiscock (2014)⁸⁰ showed a 92-100% post capture survival for spotted wolffish following net entrainment in commercial bottom otter trawl tows up to 2.5 h, haul back through a thermocline (range, 5.8 °C), and exposure to 5–13 °C air temperatures for up to 2 h. In last autumn survey the MFRI investigated this, and preliminary results suggest that spotted wolffish can survive up to two hours in fishing ramp and conveyor belts after catch. In autumn survey in 2020 the MFRI investigated this, and preliminary results suggest that spotted wolffish can survive up to two hours in fishing ramp and conveyor belts after catch. Last year MFRI also did research on survival of released spotted wolffish after catch in longline. Preliminary results suggested that the survival rate was high.

As a result of this, the MFRI gave a landings advice for the 2020/21 season and suggested that fishers would be allowed to discard spotted wolffish as per Regulation 1256/2020⁸¹ which now allows fishers (starting December 2020) to discard viable (living) spotted wolffish, as opposed to landing it dead, taking advantage of the high post capture survival of this fish. The regulation continues in the 2021/2022 fishing season⁸². As per article 1 of this regulation, if spotted wolffish is released, the type and estimated quantity in kilograms released shall be recorded in an electronic catch logbook or the smart device program. Hence the amount caught and landed and the amount caught and released is now supposed to be recorded. However, the current logbook system is not properly set up with space to recorded both landed and released spotted wolffish and for now, captains are recording (some portion) of the released part in the comment section of the logbook, which may not make it into formal records.

There is also work in progress by Trackwell to modify the electronic logbooks to allow for separate recording of landed and released catches. In addition, the MFRI is in the process of measuring the survival of spotted wolffish in Icelandic waters and, in addition to age reading, they hope to potentially develop a recovery plan for the stock. It is expected that the allowance to release live individuals (as opposed to having to land them) will contribute to bringing the catches within TAC as a first step towards stock rebuilding. However, for now, the figures reported on the Fiskistofa website represent landed values excluding releases, as it has proven difficult to record the released numbers. Halfway through the 2021/2022 fishing year, the catch of spotted wolffish was already at more than 500 t against a TAC of 377 tonnes⁸³. The total landed catch for the 2021/22 season logged on the Fiskistofa website as of December 2022 was 931 t., close to three times the allowed TAC⁸⁴. The 2021/22 season was the first full fishing season where the full effect of this regulation was recorded. According to the above, it is not clear if this new regulation is being observed in the fleet.

Status: Open, Corrective Actions in place to be reviewed annually in subsequent audits. **Progress is deemed to be behind schedule and a revised corrective action has been requested from the Client.**

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.

⁸⁰ Grant, S.M., and Hiscock, W. 2014. Post-capture survival of Atlantic Wolffish (*Anarhichas lupus*) captured by bottom otter trawl: Can live release programs contribute to the recovery of species at risk? *Fish. Res.* 151: 169-176. <https://www.sciencedirect.com/science/article/abs/pii/S0165783613002816>

⁸¹ Reglugerð um (2.) breytingu á reglugerð nr. 468/2013, um nýtingu afla og aukaafurða.

⁸² <https://www.hafogvatn.is/static/extras/images/16-spottedwolffish1259438.pdf>

⁸³ Fiskistofa. 2022. Important to release live spotted wolffish. March 16th 2022. <https://island.is/frett/mikilvaegt-ad-sleppa-lifvaenlegum-hlyra>

⁸⁴ <https://gamli.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/>

GULLLAX – GREATER SILVER SMELT (*Argentina silus*)⁸⁵

Fishing pressure on the stock is below FMSY and spawning-stock size is above MSY Btrigger, Bpa, and Blim.

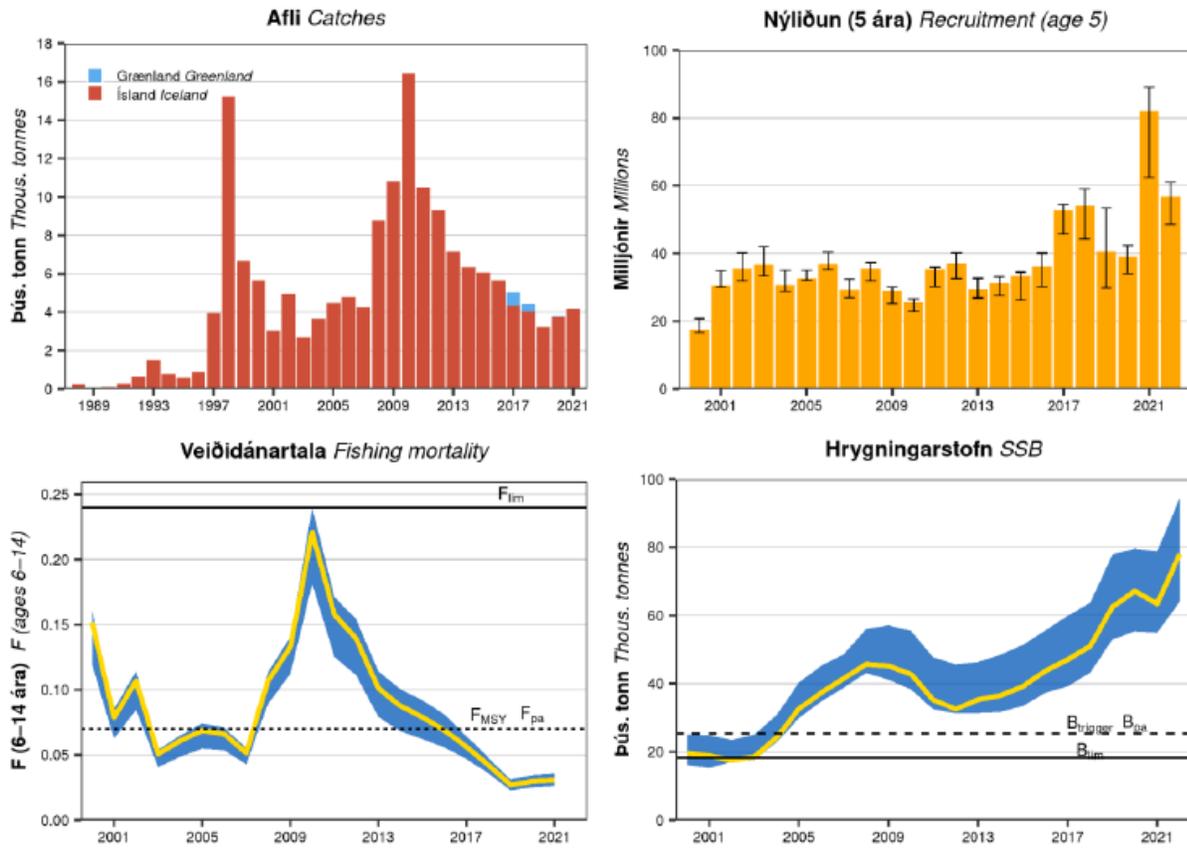


Figure 25. Greater silver smelt harvest rate and biomass.

SKARKOLI – PLAICE (*Pleuronectes platessa*)⁸⁶

Fishing pressure on the stock is above FMGT but below Fpa and Flim; spawning-stock is above MGT Btrigger and Blim.

⁸⁵ <https://www.hafogvatn.is/static/extras/images/23-greatersilversmelt1326050.pdf>

⁸⁶ <https://www.hafogvatn.is/static/extras/images/09-plaice1325992.pdf>

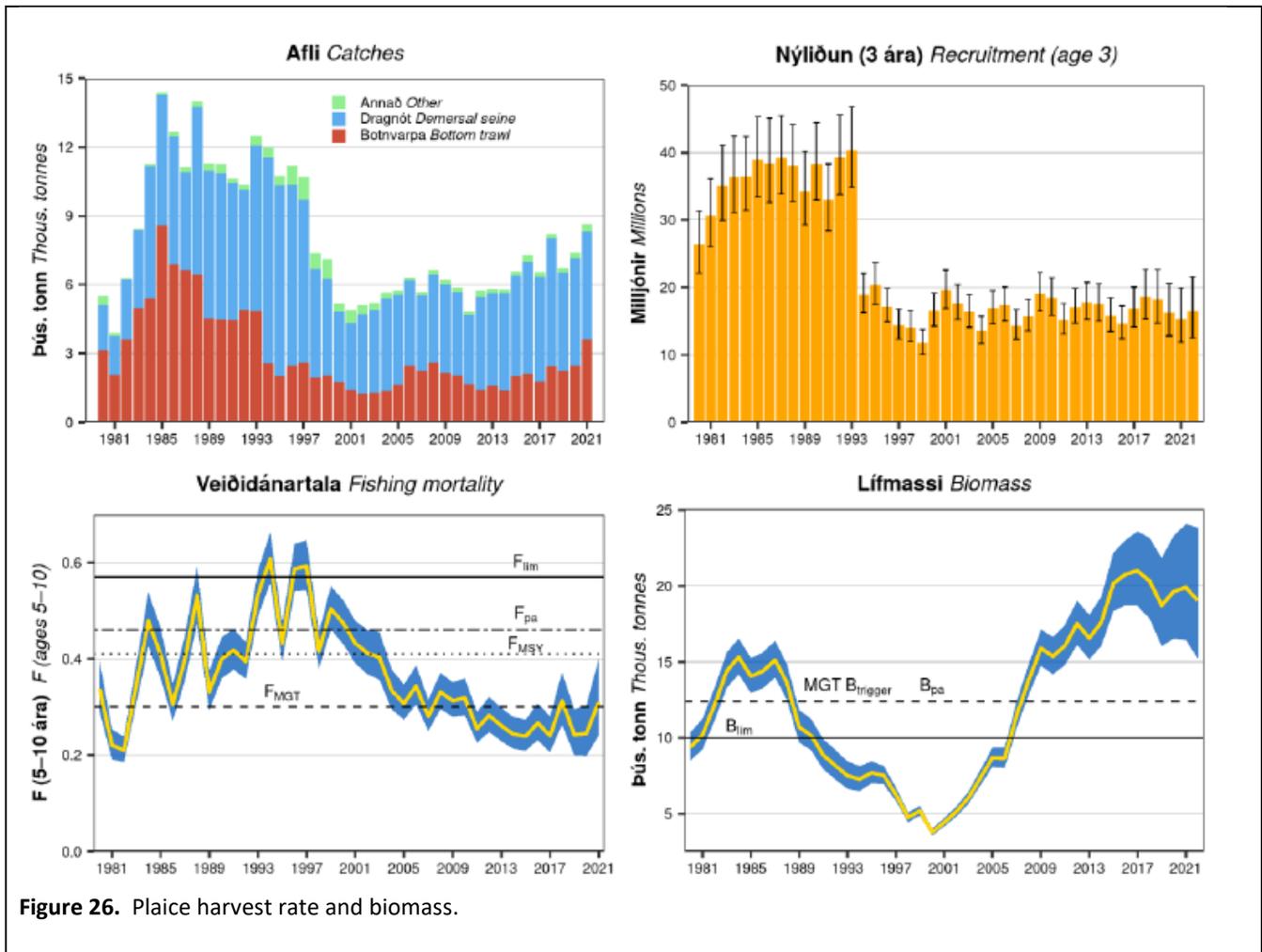


Figure 26. Plaiice harvest rate and biomass.

ÞYKKVALÚRA – LEMON SOLE (*Microstomus kitt*)⁸⁷

Biomass reference points are undefined at the moment, however the IS-SMB recruitment index is, as last year, is above average and is now measured near highest observed value in recent years. F is fluctuating around the F_{proxy} point.

⁸⁷ <https://www.hafogvatn.is/static/extras/images/10-lemonsole1325996.pdf>

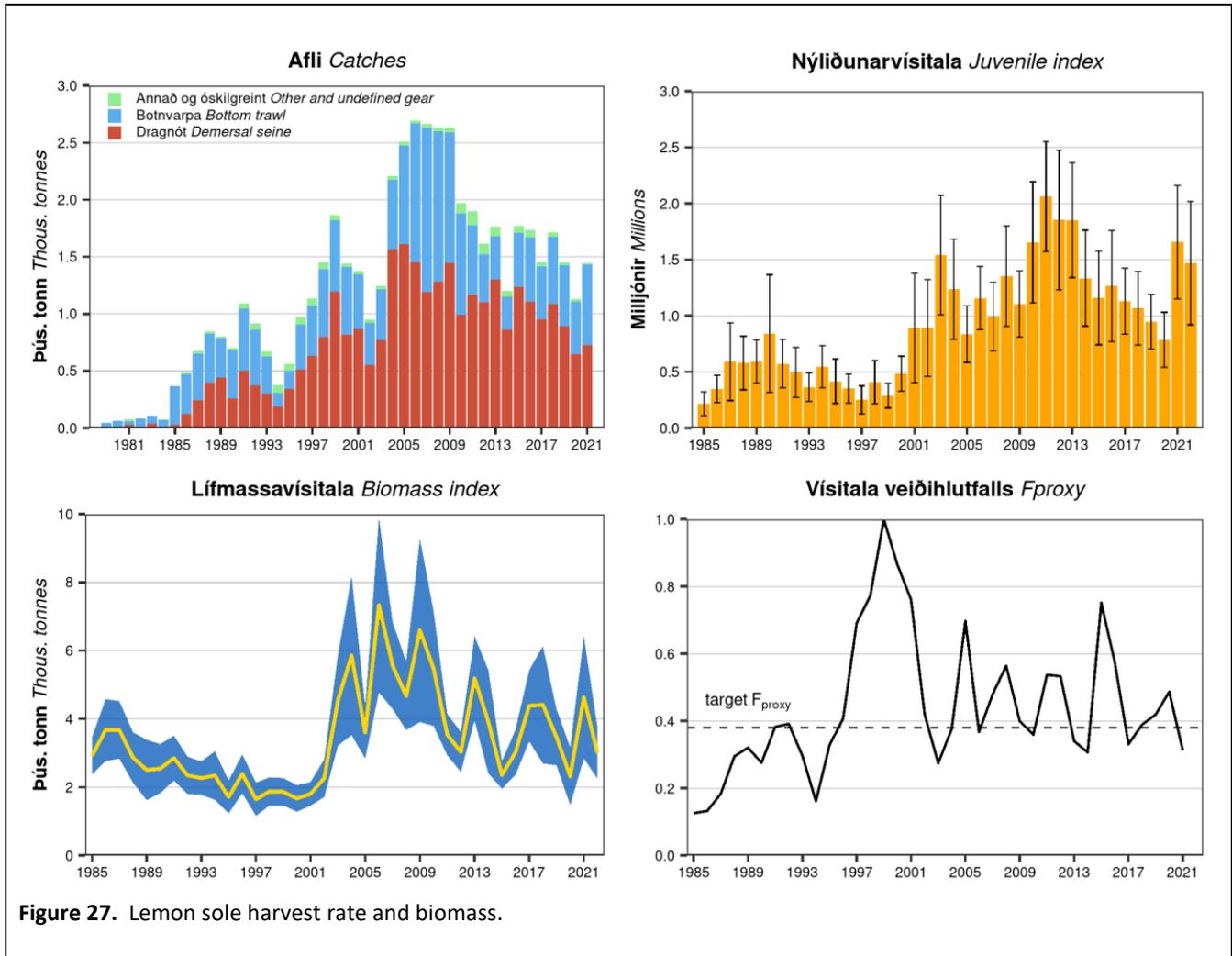


Figure 27. Lemon sole harvest rate and biomass.

LANGLÚRA – WITCH (*Glyptocephalus cynoglossus*)⁸⁸

MFRI cannot assess the stock and exploitation status relative to maximum sustainable yield (MSY) and precautionary approach (PA) reference points because the reference points are undefined. The IS-SMB covers main fishing grounds of witch. Year-to-year fluctuations in the survey biomass index can be high, but indices have been stable in recent years.

⁸⁸ <https://www.hafogvatn.is/static/extras/images/11-witch1326076.pdf>

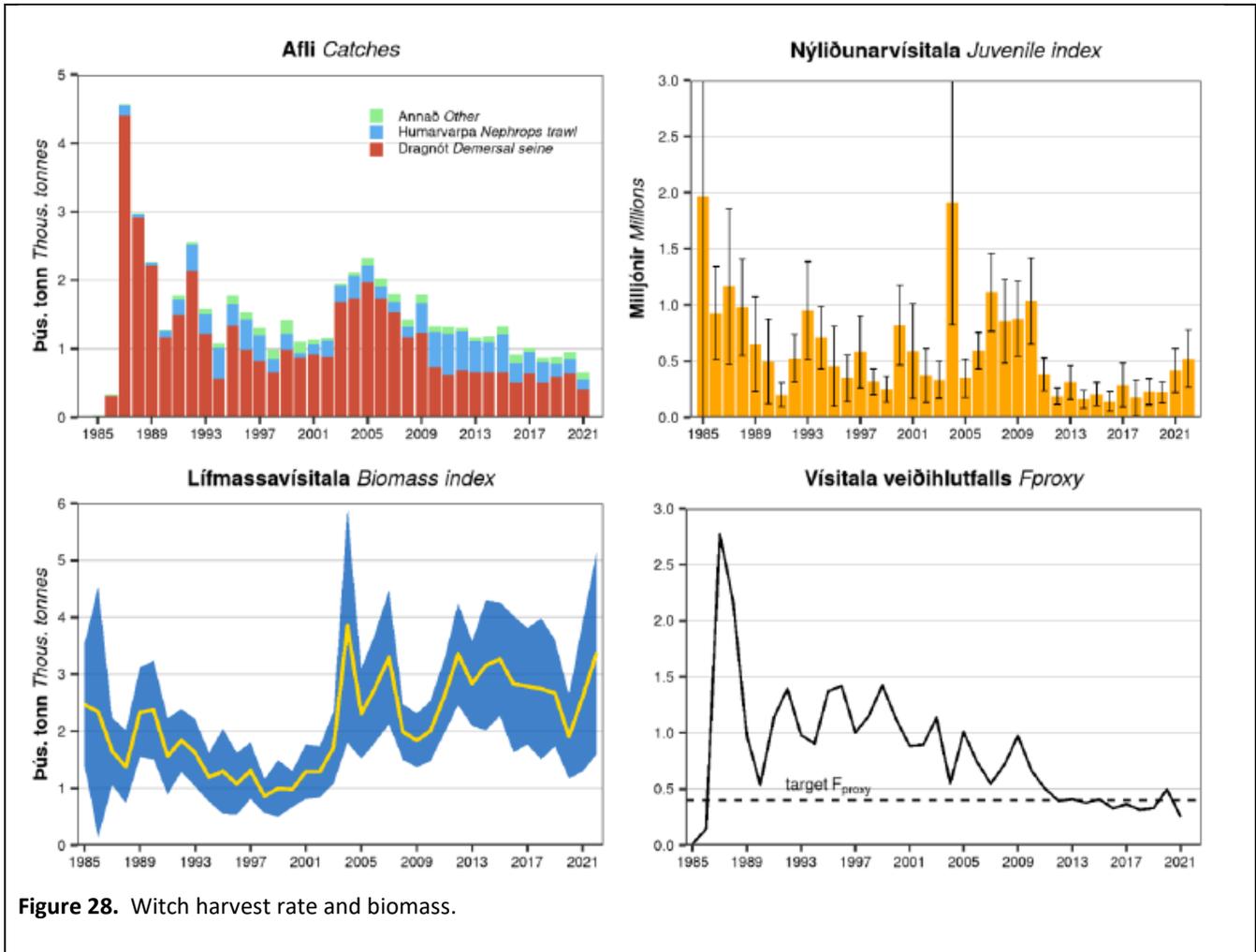


Figure 28. Witch harvest rate and biomass.

KEILA – TUSK (*Brosme brosme*)⁸⁹

Fishing pressure on the stock is above FMGT, but below Flim,; spawning-stock size is above MGT Btrigger, Bpa and Blim.

⁸⁹ <https://www.hafogvatn.is/static/extras/images/19-tusk1326034.pdf>

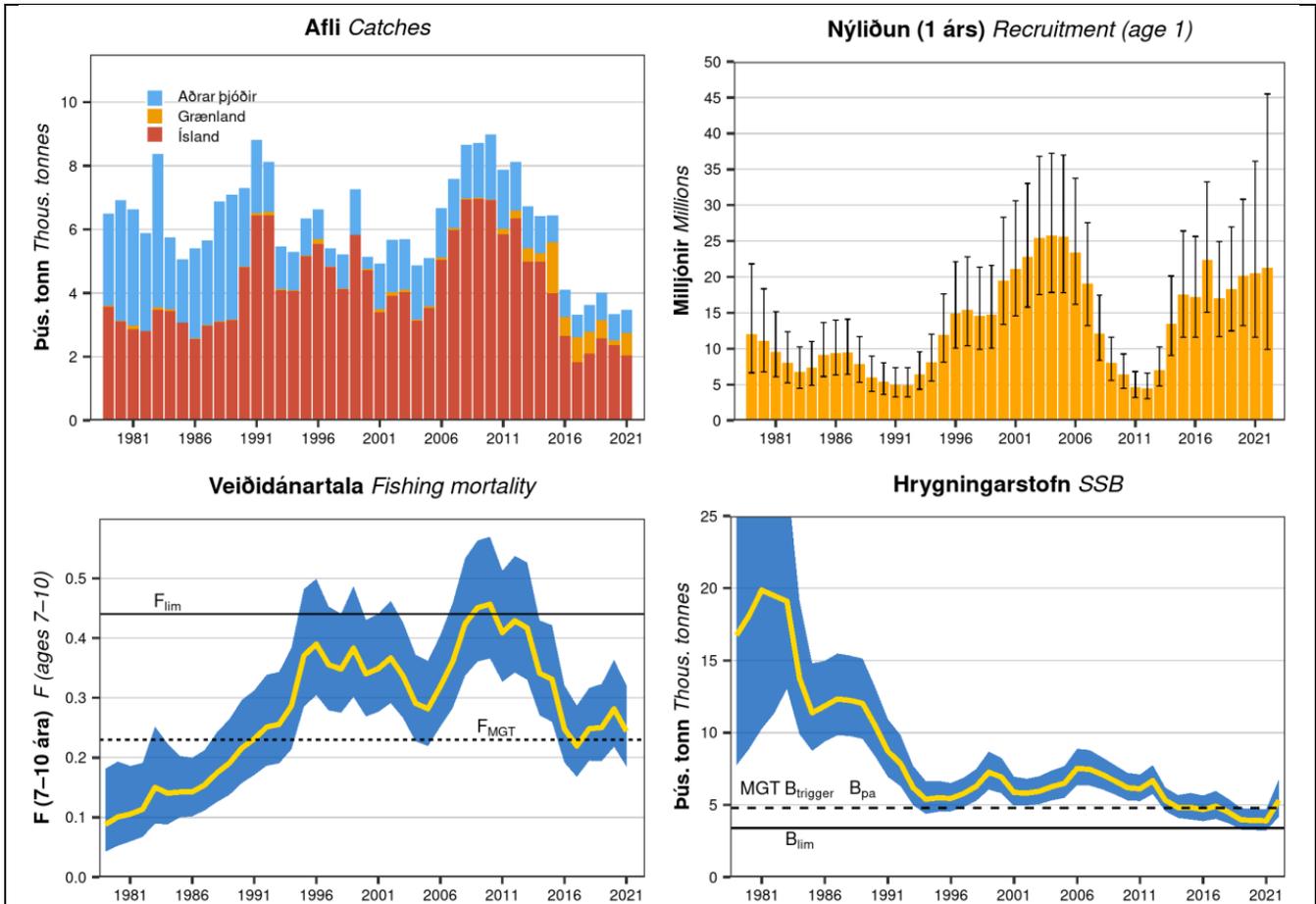


Figure 29. Tusk harvest rate and biomass.

SANDKOLI – DAB (*Limanda limanda*)⁹⁰

MFRI recommends a TAC no higher than 301 tonnes for the 2022/2023 fishing year. The MFRI also recommends that the defined quota area from Snæfellsnes to Stokksnes should be abolished and all dab fishing grounds be under TAC limits. IS-SMB biomass index of dab ≥ 25 cm is used as an indicator of stock development. The advice is based on the ratio of the mean of the two latest index values (Index A) and the mean of the three preceding values (Index B) multiplied by last year’s advice. The index is estimated to have increased by 38%, therefore uncertainty cap of 20% was applied. The precautionary buffer was last applied in 2019 and therefore applied this year.

⁹⁰ <https://www.hafogvatn.is/static/extras/images/13-dab1326010.pdf>

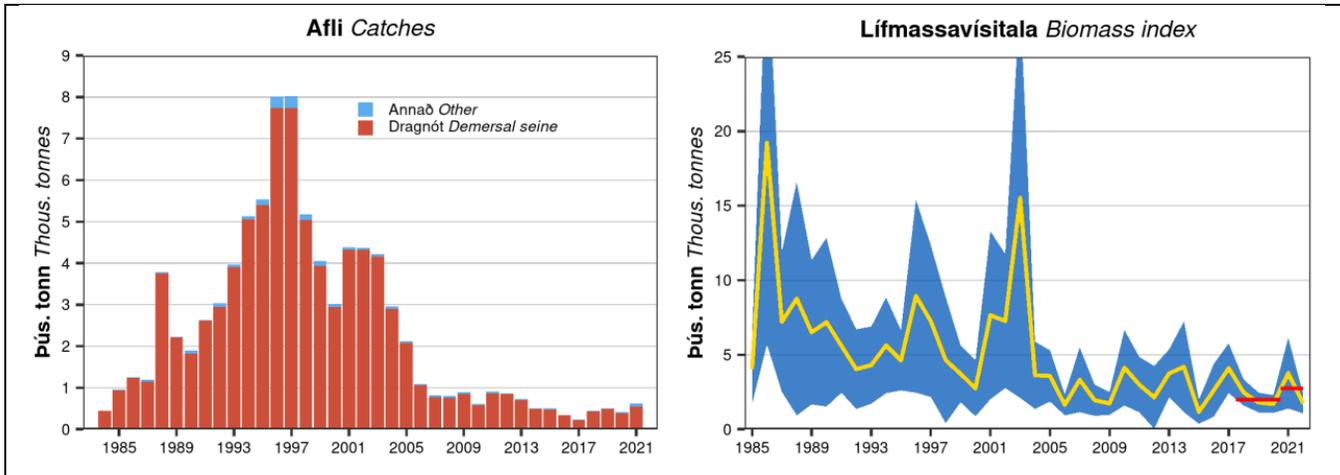


Figure 30. Dab harvest rate and biomass.

MAKRÍLL – MACKEREL (*Scomber scombrus*)⁹¹

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

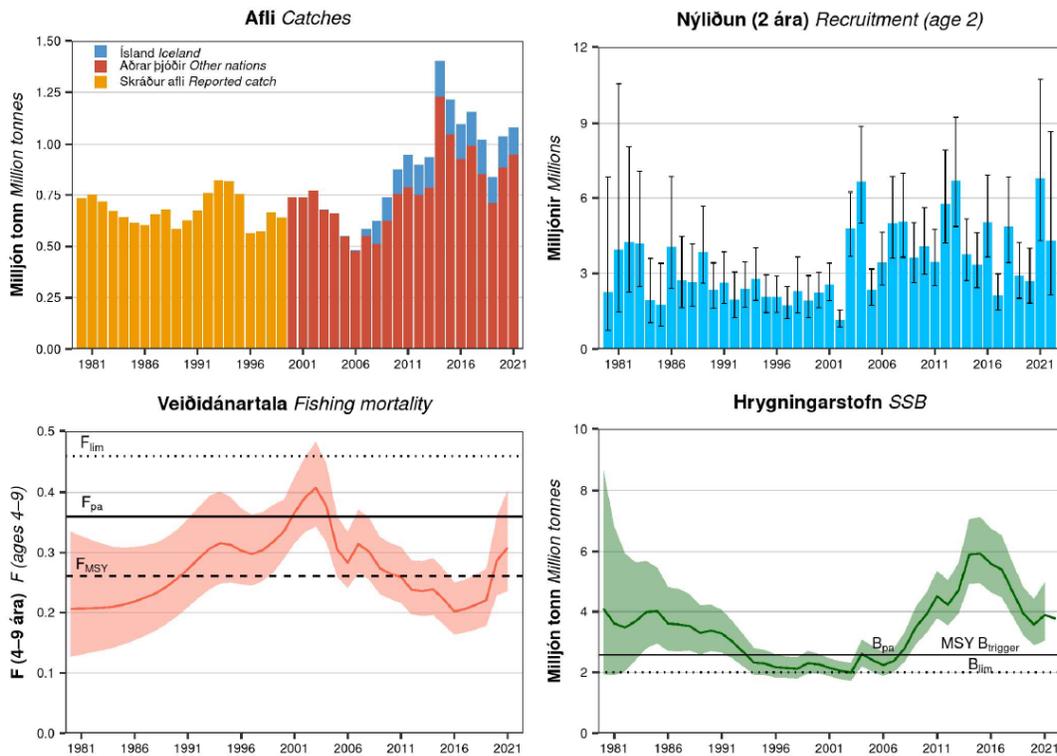


Figure 31. Mackerel harvest rate and biomass.

⁹¹ <https://www.hafogvatn.is/static/extras/images/makrill-radgjafarskjal-20221344831.pdf>

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

The MFRI has not provided any further bycatch estimates for marine mammals and seabirds. The latest data from 2016 to 2019 was provided at the previous surveillance. However, observed bycatch by onboard inspectors and in surveys in 2020 was reported in the 2021 ICES Working Group on Bycatch (WGBYC) report⁹². From the ICES 2021 WGBYC report the authors reported:” In 2020 highest bycatch levels were reported for common eider (105), black guillemots (82) and common guillemots (39). Harbour porpoise was the largest proportion of cetacean bycatches in 2019 and 2020 (21 and 23 respectively).”.

As part of the 2022 ICES WGBYC report⁹³ the authors reported:” In the Iceland Sea Ecoregion in 2021, 134 days at sea were monitored in nets and 480 days in bottom trawls. All monitoring was performed by at-sea observers. Ten bird species were recorded in nets, including 3 black guillemots (*Cepphus grille*), 1 long-tailed duck (*Clangula hyemalis*), 4 northern fulmars (*Fulmarus glacialis*), 1 red-throated diver (*Gavia stellata*), 1 northern gannet (*Morus bassanus*), 2 European shags (*Phalacrocorax aristotelis*), 2 cormorants (*Phalacrocorax carbo*), 3 common eiders (*Somateria mollissima*), 277 guillemots (*Uria aalge*) and 1 Brünnich's guillemot (*Uria lomvia*). 36 harbour porpoises, 2 grey seals, 2 harp seals (*Pagophilus groenlandicus*), 2 white-beaked dolphins (*Lagenorhynchus albirostris*) and 7 harbour seals were reported in nets. For bottom trawlers bycatch was reported for one bird species, with 2 *Uria aalge* bycaught. Additional monitoring data with at-sea observers with no bycatch incidence was reported for dredges (9 days), longlines (2 days), surrounding nets (11 days) and traps (6 days). Bycatch of several species of fish were reported in the ecoregion from 4 different taxa, including *Etmopterus spinax* and *Chimaera monstrosa* captured in bottom trawls.

Relevant updates for species for which data is available is provided below. All the species below were identified and analyzed as vulnerable or ETP species in the full assessment that resulted in the current certificate for this fishery (see relevant audit report at <https://www.responsiblefisheries.is/certification/certified-fisheries>).

Common loon

Common loon was the second species part of NC#2 assigned against Clause 3.1.1. In December 2022, the MFRI reported that no further common loons (*Gavia immer*) have been recorded as bycatch in the fisheries under assessment (i.e. cod, haddock, Golden redfish, ling, common ling, tusk, ISS herring). The last 3 birds were encountered in 2016. In the 1st surveillance, the audit team determined that because the incidental catch was based on a single event, rather than multiple, there is some basis to hypothesize that gillnet impacts may be only occasional. Furthermore, the assessment from the Iceland Institute of Natural History (INH) Red List Classification states that the population of common loon in Iceland (currently estimated at 279 pairs) is presumed to be 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-Sléttu, near Mývatn and in Veiðivötn. At this stage, significant risk from fishing appears to be relatively limited due to the lack of positive records but monitoring will continue at the next surveillance audit to check if there is updated information on this species status and/or data on potential bycatch. The WGBYC 2021 report mentions one catch of *Gavia immer* (part of Non Conformance #2) in 2019 and one in 2020, respectively, by lumpfish nets by onboard observers. Three individuals were recorded as bycatch in the Iceland Sea in 2021, apparently all caught in lumpfish nets (ICES WGBYC 2022).

⁹² ICES (2021): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.9256> https://ices-library.figshare.com/articles/report/Working_Group_on_Bycatch_of_protected_Species/18621773

⁹³ ICES (2022): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.21602322.v1>

Harbour Porpoises (*Phocoena phocoena*)

Harbour porpoises are classified as Least Concern in the IUCN Red List⁹⁴ (population trend unknown, last assessed in 2020). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)⁹⁵. 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 2009–2013⁹⁶ and down to about 750 animals in 2014-2015.

Results based on close kin mark recapture genetics indicates that the population has increased substantially in recent years.⁹⁷

The 2019 Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise (19-22 March 2019)⁹⁸ reported the following about the Icelandic harbour porpoise population. After reviewing the assessment and noting the recent decline in bycatch, 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.

In 2022 the same group provided the following update⁹⁹:” Sigurdsson indicated that a population estimate of harbour porpoise in Iceland waters was available from an aerial survey conducted in 2007, but noted that the survey was incomplete and the abundance estimate obtained then was probably an underestimate. Sigurdsson informed the WG about plans to conduct an aerial survey in July 2023 to obtain updated abundance estimates for harbour porpoise in Iceland. The group commanded the planning of such a survey. Given that abundance estimates from the NASS surveys may not be usable for harbour porpoise in Iceland, the group agreed that the 2023 abundance estimate be the one used in the future Icelandic assessment.

Sigurdsson indicated that previous work using close kin Mark-Recapture genetics and presented at the 2018 NAMMCO/IMR International Workshop on harbour porpoise indicated that the Icelandic population was increasing. Sigurdsson informed the WG that around 500 animals were by-caught annually in the Icelandic lump sucker fishery and 1500-2000 in the cod fishery, noting that by-catch levels were much higher in the past. Sigurdsson informed the WG that Iceland was also conducting isotopic work and investigating the diet of harbour porpoise using samples from by-caught and stranded animals. Life history parameters and age distribution histograms are possible to infer from these samples. The group recommended that an assessment for Iceland be made when the new abundance estimate becomes available.

Sigurdsson informed the WG of the by-catch time series available in Iceland, including some back calculated by-catch estimates, and presented at the international harbour porpoise workshop in 2018. As in the case of Norway,

⁹⁴ <https://www.iucnredlist.org/species/17027/50369903>

⁹⁵ <https://www.ni.is/node/27406>

⁹⁶ 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>

⁹⁷ North Atlantic Marine Mammal Commission and the Norwegian Institute of Marine Research. (2019). Report of Joint IMR/NAMMCO International Workshop on the Status of Harbour Porpoises in the North Atlantic. Tromsø, Norway. https://nammco.no/wp-content/uploads/2020/03/final-report_hpws_2018_rev2020.pdf

⁹⁸ NAMMCO (2019). Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise, 19-22 March, Copenhagen, Denmark. https://nammco.no/wp-content/uploads/2019/02/final-report_hpwg-2019.pdf

⁹⁹ NAMMCO-North Atlantic Marine Mammal Commission (2022). Report of the Scientific Committee Working Group on Harbour Porpoise. November 2022, Oslo, Norway. https://nammco.no/wp-content/uploads/2023/01/final-report-hpwg-2022_with-exsum.pdf

the group recommended Iceland to generate the best back-calculated bycatch estimates (i.e., generate a time series going back to the beginning of the fishery) for the upcoming Icelandic assessment, planned for 2024.”

Harbour seals

The MFRI 2021 advice for harbour seals¹⁰⁰ indicates that the 2020 harbour seal census resulted in a population estimated of 10,319 animals (95% confidence intervals: 6,733-13,906). The current population estimate is 69% lower than the first abundance estimate from 1980 and the estimate is 14% under the management objective of 12 thous. Animals (Hafrannsóknastofnun 2021). In 2019, new regulation regarding seal hunting in Iceland was enacted (Atvinnuvega- og nýsköpunarráðuneytið 2019). All seal hunting is banned, but it is possible to obtain an exemption for traditional hunt. It is also forbidden to sell Icelandic seal products. Bycatch in gillnets is probably the highest mortality risk for harbour seals in Iceland currently. Limited data are available on seal bycatch, but data collected by on-board observers of the Directorate of Fisheries, and in the MFRI gillnet survey, indicate that on average, 1389 (coefficient of variation, CV=35) harbour seals have been bycaught annually in the lumpfish fishery between 2014 and 2018. Bycatch in cod gillnet fishery and bottom trawls is less common and more uncertainty associated with the bycatch estimates in those fisheries. Between 2014 and 2018, it has been estimated that annually, 15 harbour seals were bycaught in cod gillnet fisheries (CV=102) and 17 harbour seals in bottom trawls (CV=100) (Hafrannsóknastofnun, 2019). Negative effects from the cod gillnet fisheries (and associated fisheries that land fish in those nets) are considered to be very limited.

Other marine mammals

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

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

Pingers testing

After unsuccessful trials with banana pingers and PALs in 2016-2018, PALs with a modified signal were tested in the Icelandic cod gillnet fishery in 2020. These PALs had a signal developed to emulate the signal of an out of production pinger, the Dukane 1000. The random wide-band sweep characteristic of the original PAL was maintained. Signal peaks are at 10, 50, 70 and 130kHz with a source level of 157dB. This signal is aimed at deterring porpoise rather than communicating with them as in the original PALs. The device was tested over two weeks, where over 3000 50m nets were hauled. Half of the net sets were equipped with the devices, while the other half acted as control. A total of 15 marine mammals were caught in the trial, 14 harbour porpoises and one harbour seal. Significant difference in the number of harbour porpoises was observed between the two treatments ($t = 3.78$, $p = 0.00017$), as all 14 of the harbour porpoises were caught in the control sets, while none were caught in the PAL equipped sets. The single harbour seal bycaught was caught in a PAL equipped set. These results suggest that this configuration of the PAL might be effective in reducing harbour porpoise bycatch in Icelandic waters. There have been no further updates since then.

Gulper sharks

¹⁰⁰ <https://www.hafogvatn.is/static/extras/images/radgjof-landselur20201286028.pdf>

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

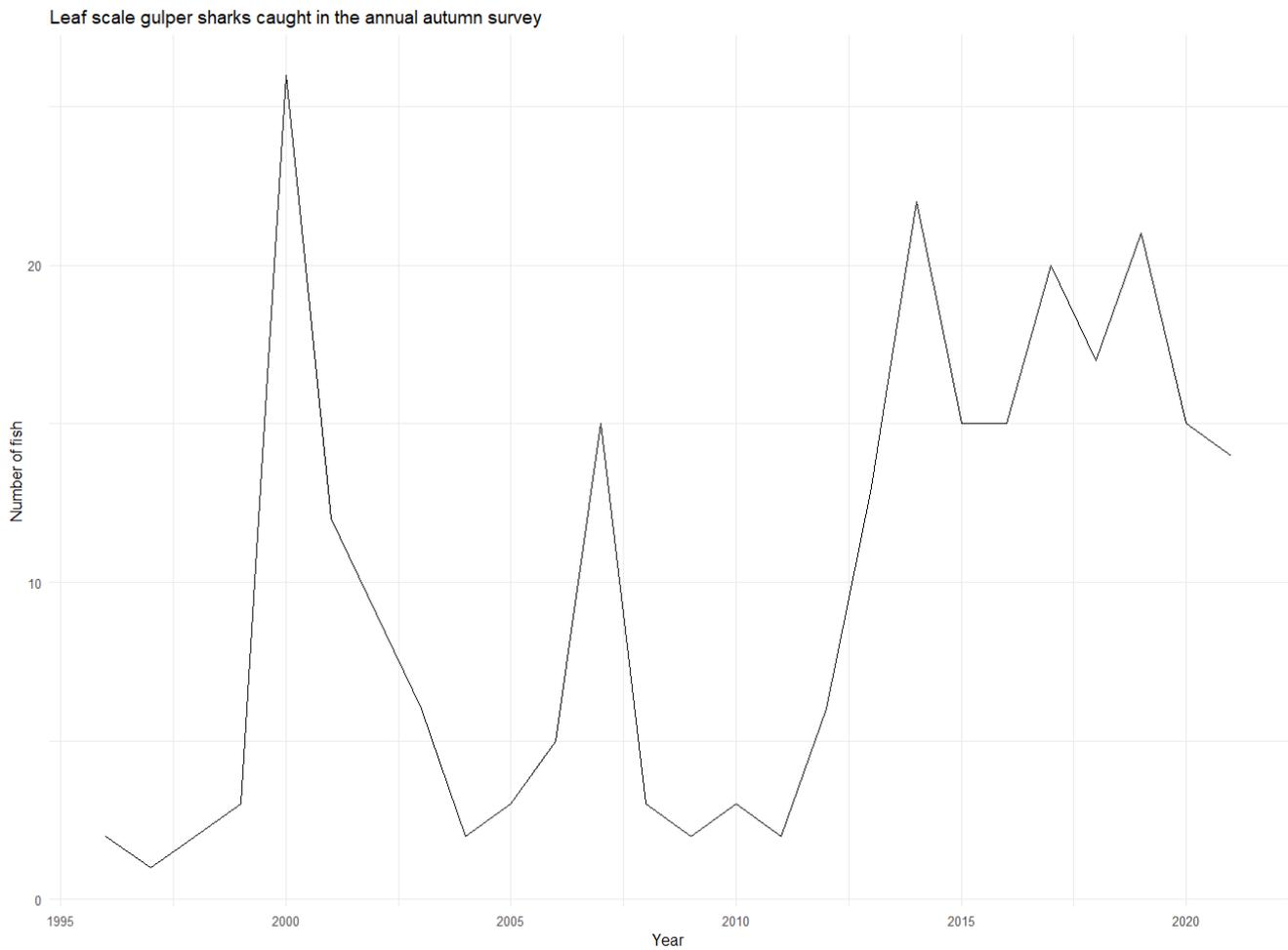


Figure 32. Leaf scale gulper shark caught in the annual autumn survey, from 1996 to 2022.

Grey skate (*Dipturus flossada / batis*) survey abundance is variable but has been on average relatively stable in recent years. The MFRI spring survey caught 56 t in 2019, 43 t in 2020, 32 t in 2021 and 69 t in 2022. Fishery landed catch of Grey skate was 160 t in 2020 and 158 t in 2021.

Landed catch of dogfish (*Squalus acanthias*) was 1 t in 2019 and 3 t in 2020, and 0.9 t in 2021. Survey trends are very sporadic.

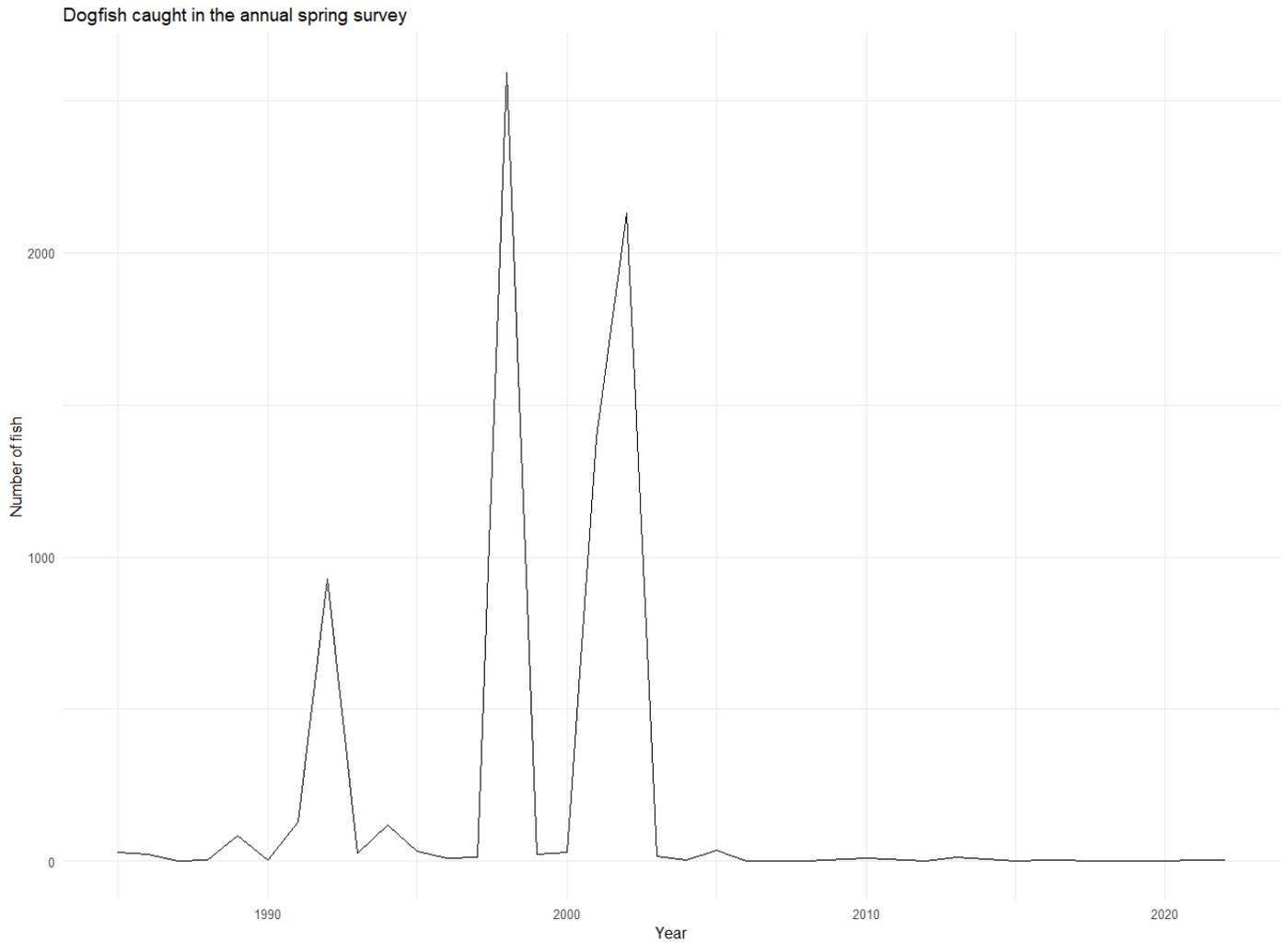


Figure 33. Dogfish caught in the annual spring survey, 1985 to 2022.

No Greenland sharks (*Somniosus microcephalus*) were caught in the 2020-2022 surveys. Around 16 tonnes of them were landed in both 2020 and 2021.

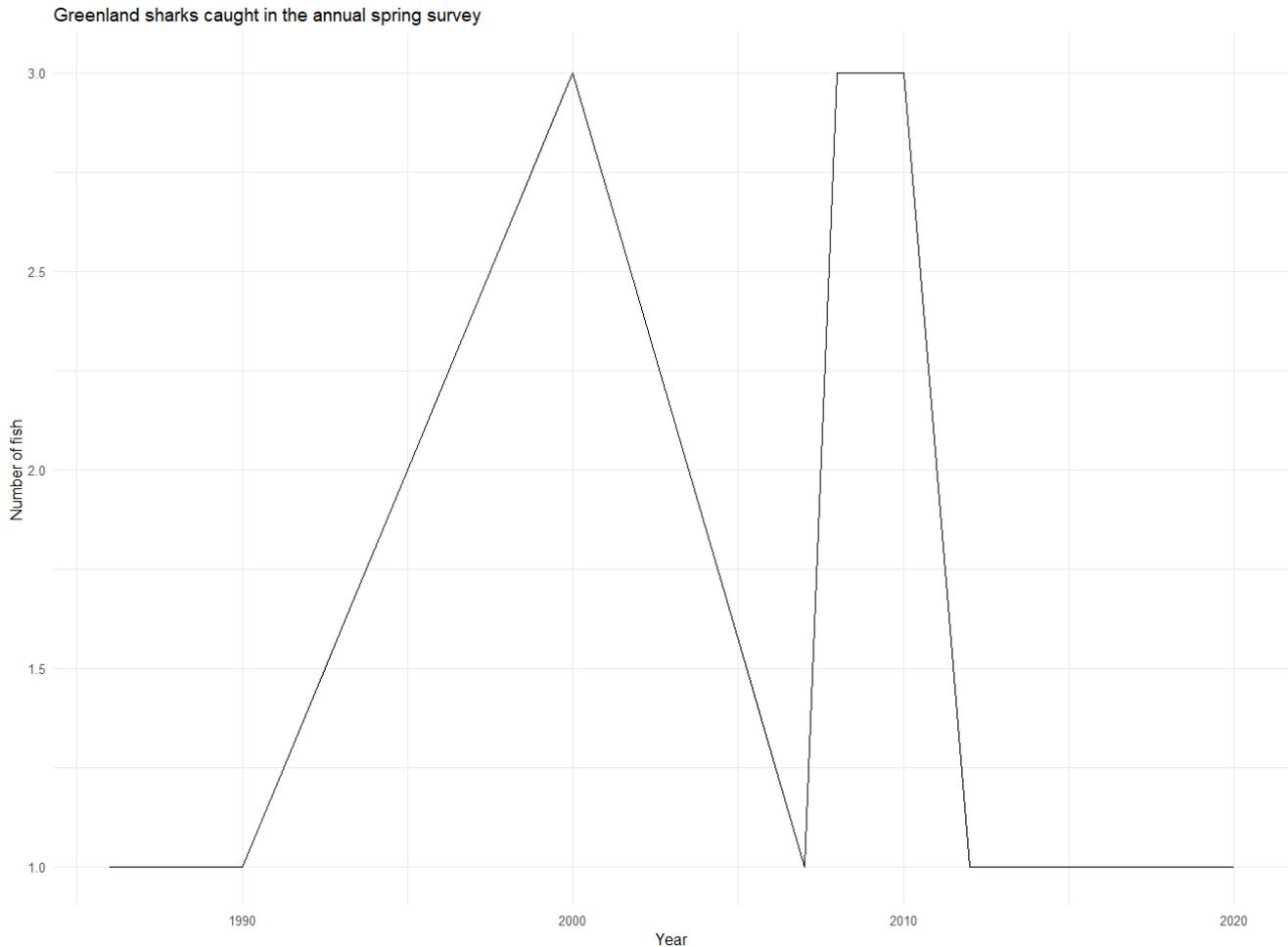


Figure 34. Greenland shark caught in the annual spring survey.

Around 3.6t of porbeagle (*Lamna nasus*) were landed in 2020 and 2.3t in 2021. Porbeagles are rarely caught in surveys, but two were caught in the autumn survey in 2021.

No records of basking sharks are available in catch or surveys. Few have been recorded by onboard inspectors, last one in 2005.

7.5.1.2 Habitat

Trawl effort spatial extent

The ICES 2022 Icelandic ecosystem overview report¹⁰¹ indicates that the main abrasive pressure in the Icelandic Waters ecoregion is caused by mobile bottom-fishing gears (targeting fish, shrimp, and Norway lobster *Nephrops norvegicus*). 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

¹⁰¹ ICES. 2022. Icelandic Waters ecoregion –Ecosystem overview. In Report of the ICES Advisory Committee, 2022. ICES Advice 2022, Section 11.1, <https://doi.org/10.17895/ices.advice.21731663>

have been shown to be minor. Other impacts involve overturning boulders, scouring the seabed, and direct removal of and/or damage to epifaunal organisms.

The total fishing effort by bottom trawls targeting fish and shrimp has decreased by around 40% in 2000–2014; in the same period the Nephrops trawling effort remained at the same level. The decrease in fishing effort varied locally, with decreases mainly being noted on the southern shelf (Subarea 1) and at typical shrimp trawling grounds on the northern shelf (Figure 35, Figure 36). Based on analysis of electronic logbook data an area of about 79000 km² in total was fished with towed bottom-fishing gears in 2013, composing 10% of the ecoregion.

Using vessel monitoring system (VMS) and logbook data ICES estimates that mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category have been deployed over approximately 132 485 km² of the ecoregion in 2018, corresponding to ca. 17.5 % of the ecoregion’s spatial extent (Figure 36). The latter figure (132.485 km²) refers to numbers based on ais/vms data delivered to ICES (different from the previous approach used). It is in conformity with what is reported in mynd 29A (add fish, nephrops and shrimp).¹⁰²

The overall bottom trawl fishing effort has been decreasing since the early 2000s and is now at the lowest level.

The Icelandic bottom trawl fleet consists of about 50 vessels (30–80 m length) fishing mainly for cod, haddock, saithe, redfish, and Greenland halibut.

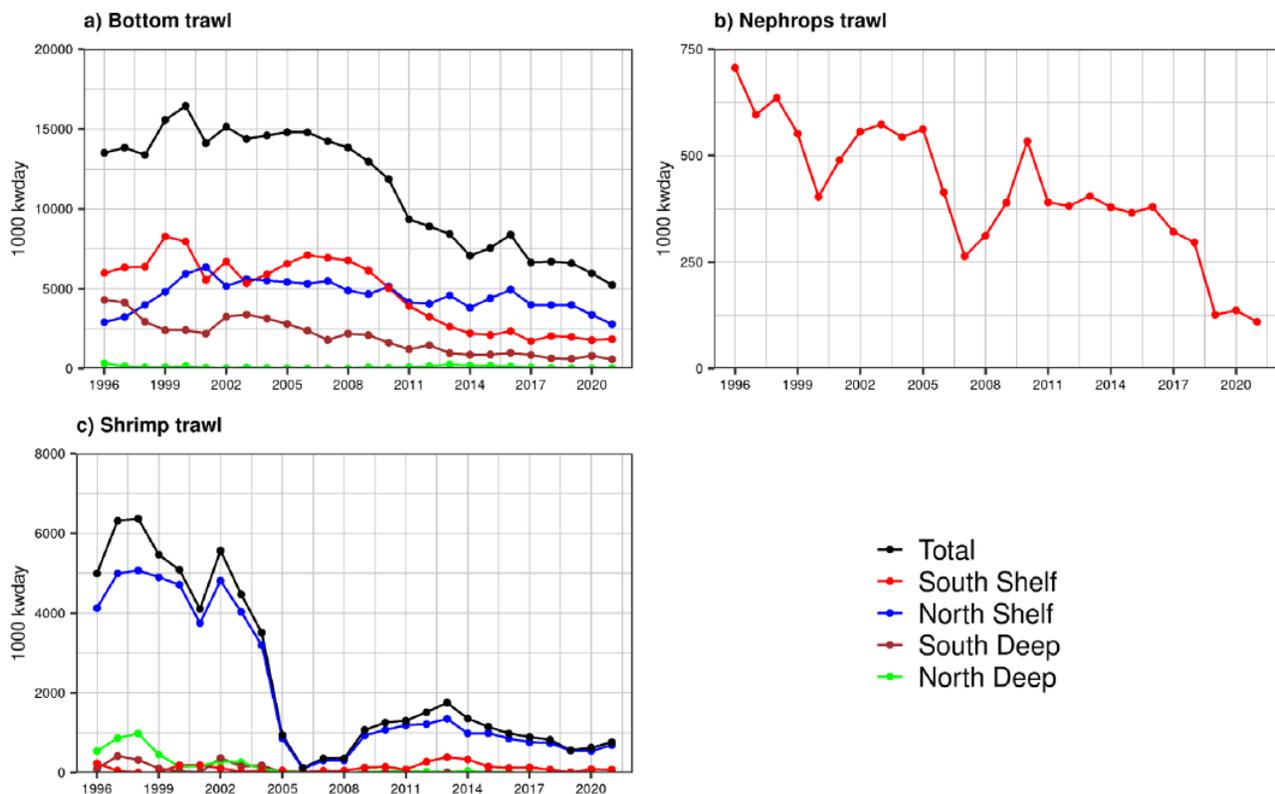


Figure 35. Annual total bottom-trawl fishing effort (1000 kW day) based on logbooks from trawl fishery targeting (a) fish, (b) Norway lobster, and (c) shrimp in the whole Icelandic Waters ecoregion between 1996 and 2021.

¹⁰² <https://www.hafogvatn.is/static/research/files/hv2021-50.pdf>

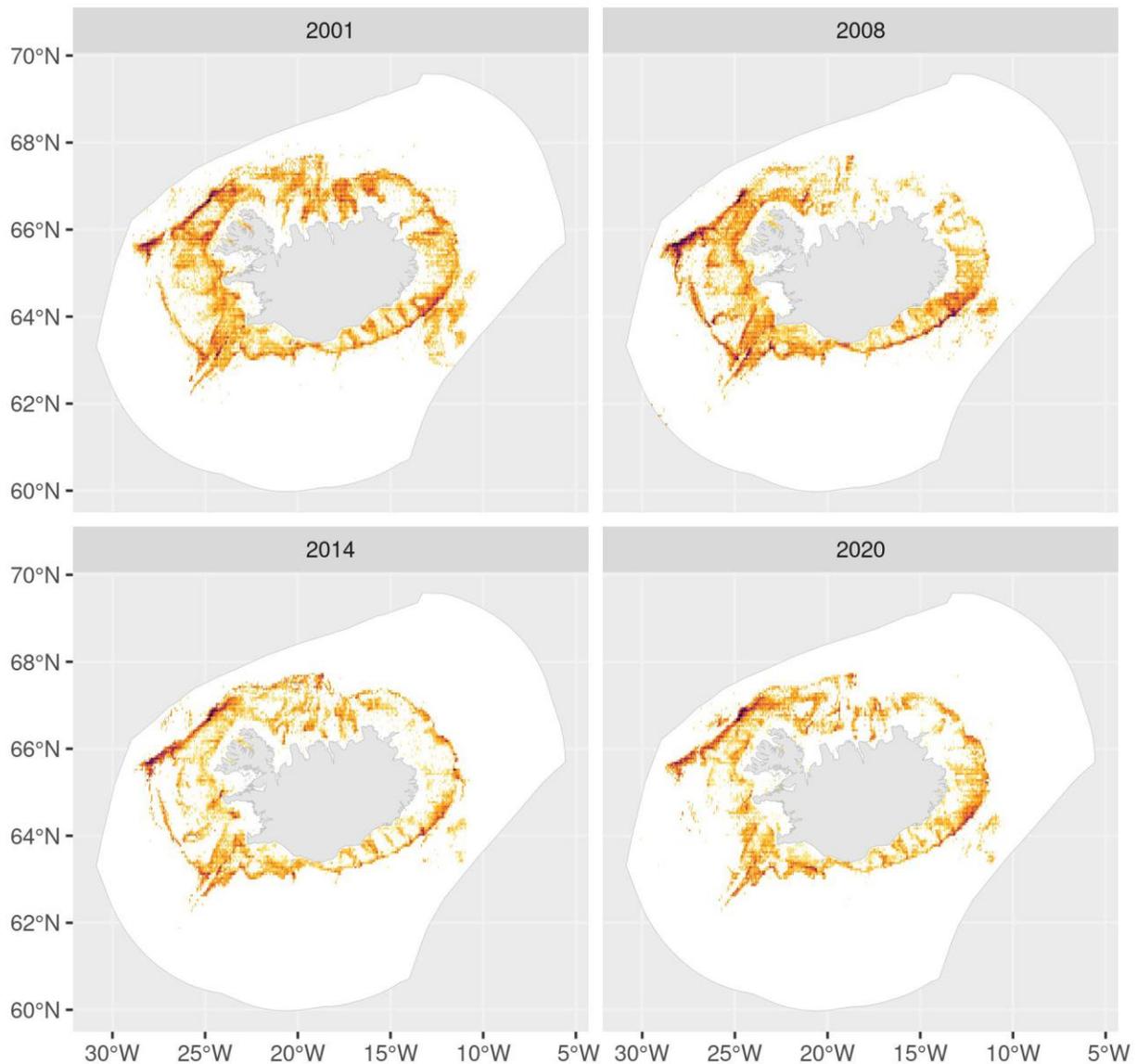


Figure 36. Spatial distribution of bottom-trawl effort (1000 kW hr) based on logbooks from trawl fishery targeting demersal fish, shrimp, and Norway lobster in 2000, 2008, 2014, and 2020.

Habitat mapping

Seabed mapping is one of the Marine and Freshwater Research Institute’s projects which started with the launching of the research vessel, Arni Fridriksson RE 200, in the year 2000. The vessel is equipped with a multibeam echo sounder which enables a detailed mapping of the seabed. Until spring 2017 the multibeam echo sounder was of the type Kongsberg EM 300 (30 kHz, 135 beams, 2°x2°) but was then updated to Kongsberg EM 302 (30 kHz, 432 beams, 1°x2°, water column data) and a subbottom profiler, Kongsberg TOPAS PS18.

From the year 2017 the seabed mapping project is one of MFRI’s major initiatives for the next 12 years. The main emphasis is to gain information within the economic zone which is useful for multifaceted purpose and is a prerequisite for scientific approach for sustainable utilization, protection and research of resources in the ocean,

on, in and under the seabed. The detailed mapping has been valuable for the research of the marine environment, the physical properties of the ocean and the marine geology. Mapping fishing grounds and vulnerable areas, i.e. benthic communities and habitats, has played a significant role. About 44.3% of the economic zone has been mapped, or approximately 333,700 square kilometers of the country's total 754,000 square kilometer economic zone. A figure of the mapping work completed has been shown below.

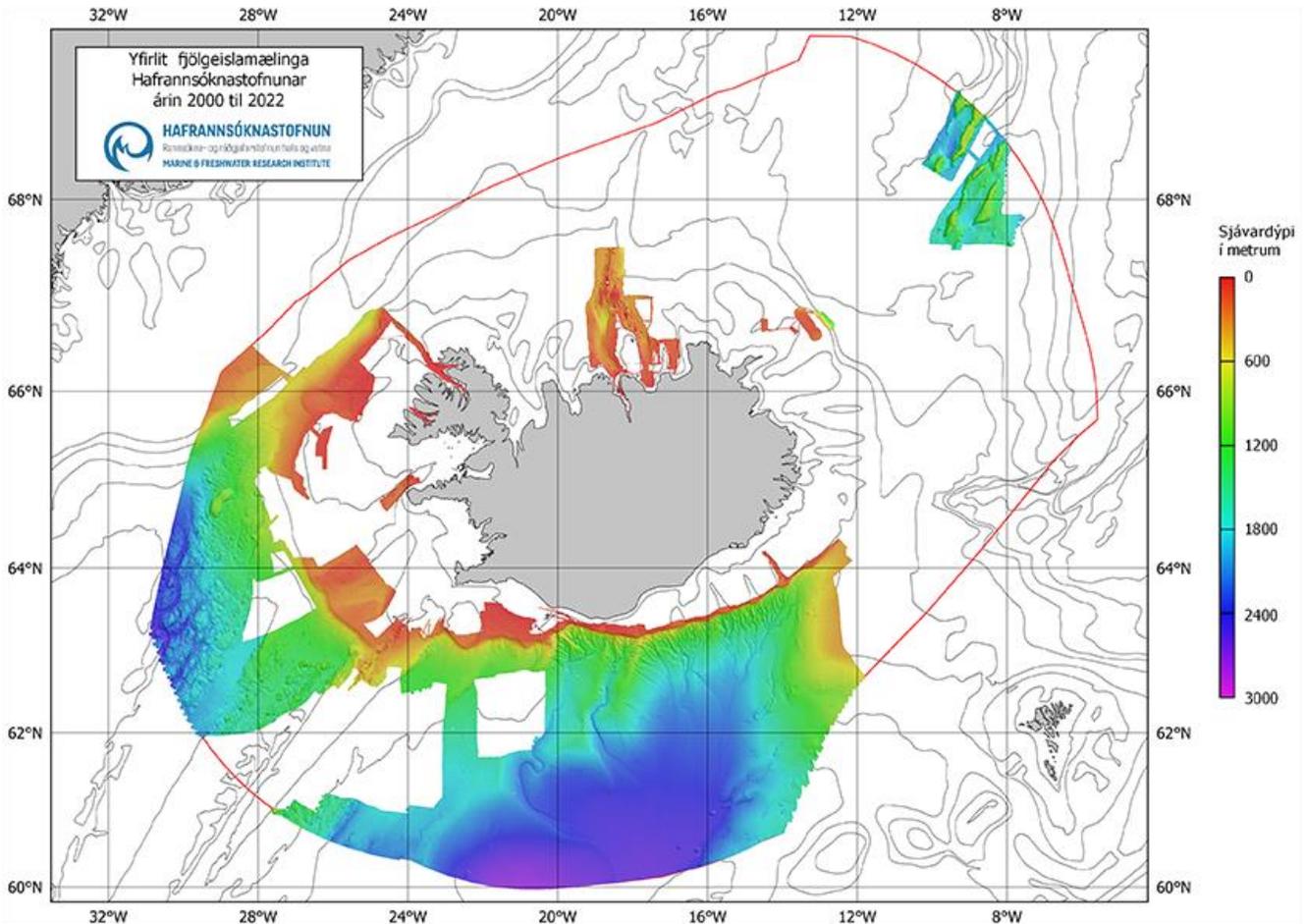


Figure 37. MFRI overview of seabed mapping in Icelandic waters between 2000 and 2022. Source: <https://www.hafogvatn.is/en/research/seabed-mapping>.

NovasArc project

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)¹⁰³. 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.

¹⁰³ <http://norden.diva-portal.org/smash/get/diva2:1304079/FULLTEXT02.pdf>

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 decreased the amount of suitable habitat for these benthic groups.

Also, based on the findings of the Novasarc work a paper on the distribution of indicator VME taxa was published by Burgos et. al (2020)¹⁰⁴. The group that produced this publication has received an additional funding to develop this work further including managemental aspects in 2021. The MFRI highlighted during the November 2021 site visits that Novasarc II is now ongoing and will concentrate on updating predictive models and discuss the output for managemental purposes.

In October 2022 the MFRI highlighted that the NovasArc II project had a stakeholder meeting last September and the final report will be submitted to TemaNord this autumn. Updated models have been prepared including confidence estimation. Such models are increasingly considered in managemental purposes. This work has been introduced to the Ministry of Fisheries although the best use of this work has not been discussed in detail.

Benthos recorded in the MFRI survey

Recording of benthic animals as a bycatch in the autumn MFRI trawl took place for the fifth time in 2020 (Jakobsdóttir et al. 2020¹⁰⁵) (Figure 38). Benthic animals were collected at 105 stations. Benthic animals are classified into species as far as possible, counted and weighed. Amount of benthic animals in tows ranged from 0.028 kg to 97.5 kg and the number of individuals counted in tow ranged from 1 to 1,213. The largest number of individuals were fungi. Maximum number of identified species or groups in tow there were 71 species at a station west of Kolbeinseyjarhrygg and the fewest species, a total of 3, occurred two stations in the continental shelf south of the country. At one point west of Reykjanes was the total weight of benthic animals in a tow was 97.5 kg and a total of 50 species, most of which contained 80 kg of coral. Sponges weighed the most at other stations. Six benthic species were identified at the Faroe Islands ridge that have not occurred in previous surveys. A total of over 700 species have been identified from the five autumn surveys since benthos bycatch has been recorded.

¹⁰⁴ <https://www.frontiersin.org/articles/10.3389/fmars.2020.00131/full>

¹⁰⁵ Klara Björg Jakobsdóttir, Höskuldur Björnsson, Jón Sólmundsson, Kristján Kristinsson, Steinunn Hilma Ólafsdóttir og Valur Bogason. 2020. Protected areas within Iceland's territorial waters and fragile ecosystems. Summary for the Ministry of Industry and Innovation of the available data from areas in the sea around Iceland that have been closed for over 10 years and fishing with demersal gear has been restricted or banned. HV 2021-49 <https://www.hafogvatn.is/static/research/files/hv2020-54.pdf>

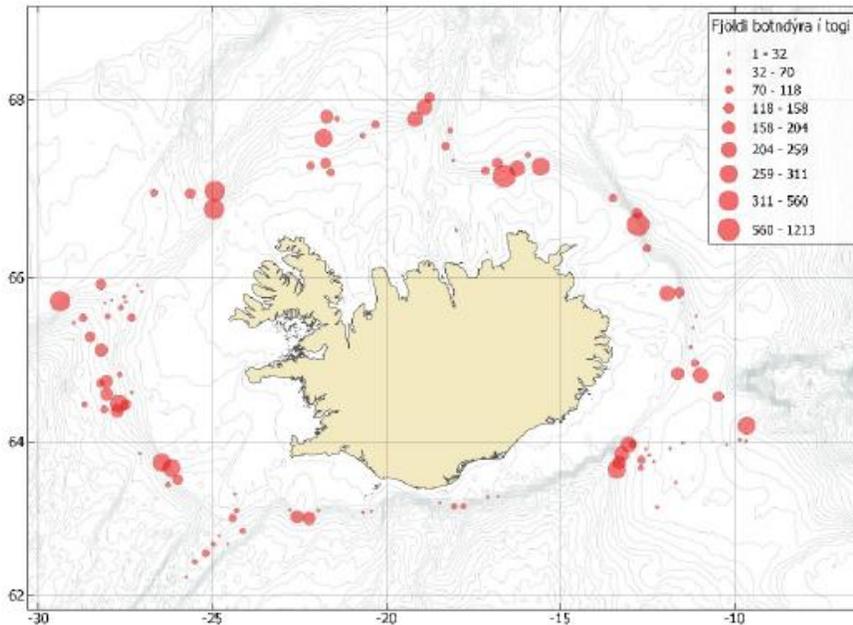


Figure 38. Benthos recorded in the autumn Icelandic autumn groundfish survey in 2020. Number (kg) per tow.

The Ministry of Industry and Innovation has begun work on formulating a protection policy for vulnerable bottom ecosystems (or vulnerable marine ecosystems) within the Icelandic economic zone to shape procedures for the protection of fragile benthic ecosystems based on international standards criteria that Iceland is signatory to. This includes defined demersal fishing areas and protected areas. Therefore, the Ministry requested that the Marine Research Institute compile information in addition to evaluating five aspects of fragile benthic ecosystems, reported on by Ólafsdóttir et al. 2021¹⁰⁶. These five aspects are:

1. An assessment of which species in Icelandic waters are considered fragile ecosystems in Iceland. At the same time, an overview of the state of knowledge is compiled the distribution and density of the species. The summary will take into account FAO guidelines as well as the work of ICES, NAFO and NEAFC.
2. Define for each species or groups that can be considered as characteristic species ecosystems, when their density is considered so high that an area is considered to be a fragile ecosystem.
3. Perform an analysis of any of the areas that have been closed for a long time to evaluate if it meets the criteria for being considered a vulnerable bottom ecosystem.
4. Propose a definition of what can be considered a significant negative effect from bottom fishing gear on fragile bottom ecosystems.
5. Define demersal fishing areas where fishing has taken place for the past 20 years (or other years if this describes fishing in recent decades better), with bottom fishing gear (bottom trawls, seines, nets, lines, dredges).

¹⁰⁶ Steinunn Hilma Ólafsdóttir, Stefán Á. Ragnarsson, Julian M. Burgos, Einar Hjörleifsson, Klara Jakobsdóttir og Guðmundur Þórðarson. 2021. Protection of fragile benthic ecosystems. Summary of information and evaluation of five factors is concern sensitive bottom ecosystems for the Ministry of Industry and Innovation. HV 2021-50 <https://www.hafogvatn.is/static/research/files/hv2021-50.pdf>

One of the outputs of the report is shown below. The map below shows details of closed areas (in grey), and in yellow or red the distribution of areas where bottom trawling has taken place for 4 years or less and 5 years or more between 2009-2019. Light yellow surfaces show shrimp and lobster trawl fishing grounds.

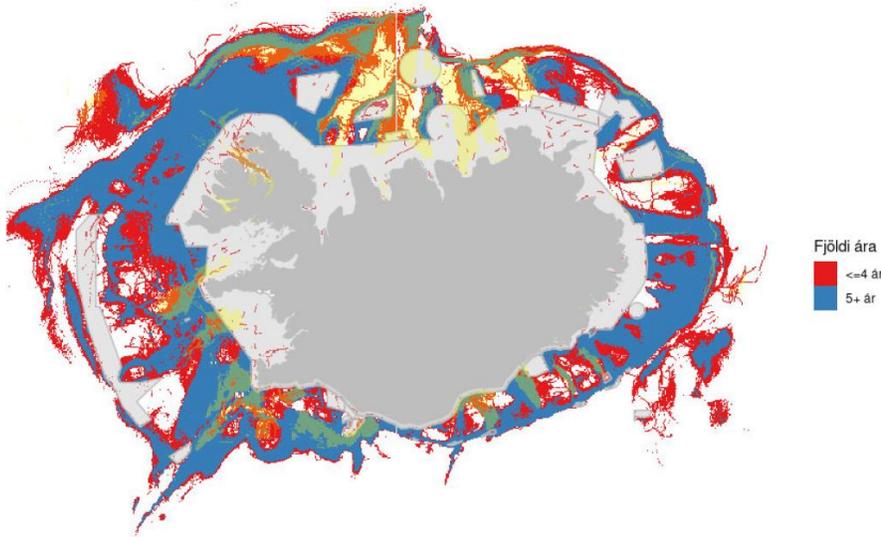


Figure 39. Long term closures and selected fishing distribution around Iceland between 2009-2019.

The closures that MFRI proposed are being processed at present time (October 2022) by the Ministry of Fisheries. The closures include Hydrothermal vents, Sponge Aggregations mixed with Cauliflower coral ground and Sponge Aggregations on underwater mountains.

Long term area closures

Fiskistofa has created a new GIS platform where all spatial data relevant to Icelandic fisheries management has been integrated. The figure below for example contains information on long term spatial closures in Iceland.

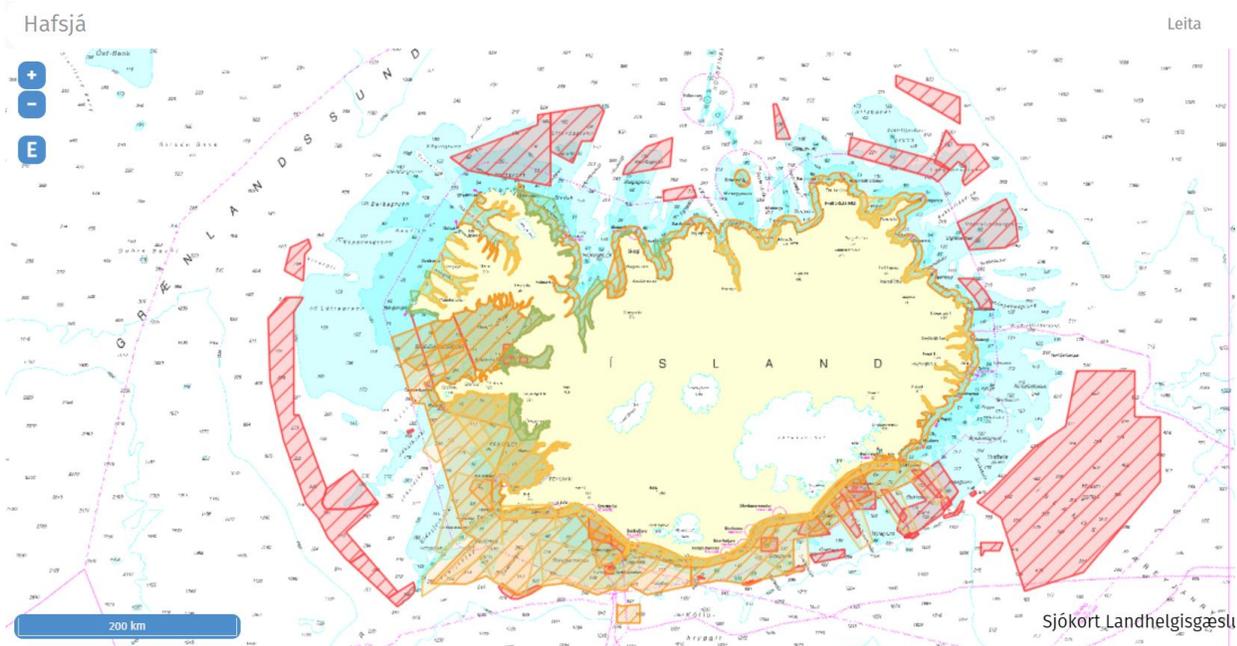


Figure 40. Regulatory long-term closures in Iceland, all gear types. Red closures tend to be bottom trawl and sometime all gear closures. Yellow/orange boxes with internal lines near the coast (East, West and North West) are longline closures. Open yellow/orange boxes south and southeast of Iceland are lobster trawl restricted areas. For details on each closure including dates and gear restrictions please click on each red box in the Atlas/GIS website managed by Fiskistofa at <http://atlas.lmi.is/mapview/?application=haf> .

7.5.1.3 Foodweb considerations

The MRI has studied Icelandic cod and its place/relationship in the ecosystem.

Capelin is a key forage species in the ecoregion, and promotes an important energy transfer into the ecosystem. Capelin feeds mainly on copepods and euphausiids, and it is one of the most important prey for several predators, e.g. cod, haddock, saithe, Greenland halibut, seabirds, and marine mammals¹⁰⁷. The Capelin stock appears to be quite abundant as per the 2022 stock assessment.

Icelandic capelin’s status was assessed by the MFRI again in 2022¹⁰⁸. Based on the 2021 acoustic autumn survey and surveys conducted in January and February 2022 and catches this season, the median of the distribution of SSBs used as input into harvest control rule (HCR) is 1’342’000 tonnes. The HCR aims at leaving at least 150’000 tonnes (Blim) of mature capelin at the time of spawning in March with 95% probability. Model projections show

¹⁰⁷ https://www.hafogvatn.is/static/files/2022_2/fisheriesoverview_icelandicwaters_2021.pdf

¹⁰⁸ https://www.hafogvatn.is/static/extras/images/lodnavetur2022_final1303548.pdf

that with maximum catch of 869 600 tonnes during the fishing season 2021/2022, the HCR goal will be achieved.

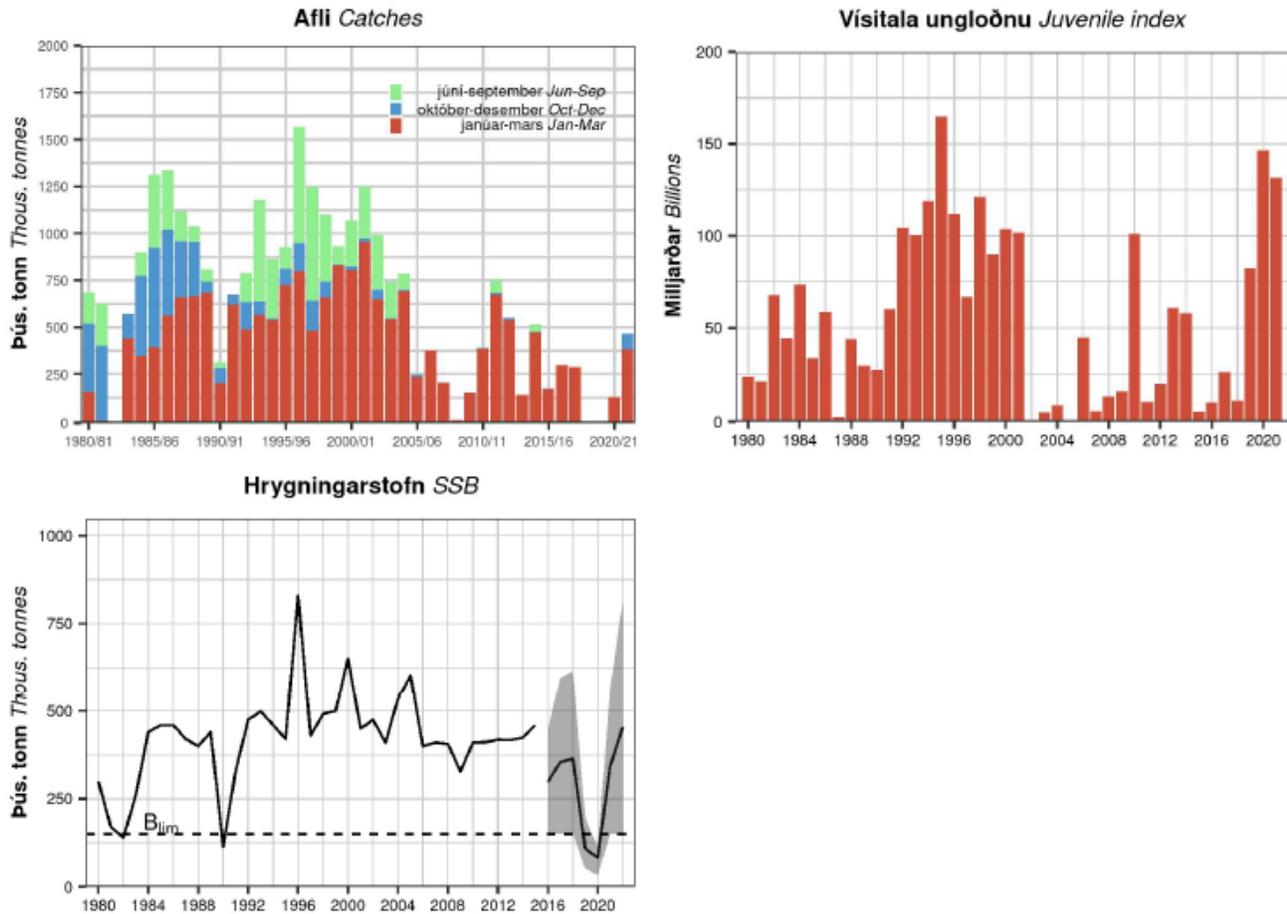


Figure 41. Catches, acoustic index for immatures from autumn surveys, and SSB at spawning time (with 90% confidence limits since 2016). The SSB value for 2016 and onwards is not directly comparable to historical values because it is based on different assumptions about natural mortality. Catches from the fishing year 2021/22 are obtained at publishing date and therefore not final.

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

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

Section 1. Fisheries Management

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

<p>1.1 Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls including:</p> <ul style="list-style-type: none"> – The fisheries management system – The fisheries management plan 	
<p>Summary of relevant changes:</p>	<p>The fisheries management consists of a network of organisations and agencies with a legal basis in terms of a suite of laws and regulations. The Ministry of Food, Agriculture and Fishery has the ultimate responsibility, the Directorate of Fisheries is the executive body, the Coast Guard does control and surveillance and the MFRI is the scientific institution that provides advice to the Ministry. Internationally, ICES organizes and approves assessment and management plan evaluation. The legal basis for the management is a suite of laws and regulations. Laws are given by the Parliament (Althingi), regulations are given by the Ministry.</p> <p>The main regulations are quota regulations of the catches in an ITQ system, technical regulations (gear standards, mesh sizes etc), area closures (permanent and temporary, including short term closures), landing obligations in authorized ports where the catches have to be weighed by authorized staff and a discard ban. There are rules for minimum landing size – smaller fish has to be landed but the fisher gets only a fraction of the payment). There are a range of special regulations for small coastal boats and regulation of tourist fishery (which also has quotas). Log books are compulsory, and recently, only electronic logbooks (or mobile phone apps) are accepted. The fishing year in Iceland runs from 1st September - 31st August.</p> <p>All catches have to be accounted against quotas, and there is an active market for selling and buying quotas as needed. For most stocks, including cod, quotas can be transferred between years and between species (only in terms of using cod quotas to cover other species), within certain bounds.</p> <p>The management plan includes the measure noted above. It has a harvest rule for deriving the total quota from a stock assessment. The plan includes reference points for biomass and exploitation rate. Such plans are generally developed by Iceland, mostly by the MFRI, and evaluated and endorsed by ICES.</p> <p>The management plan was re-evaluated in 2021. No changes were made to the plan, but the value of some reference points not part of the plan was changed.</p>
<p>References:</p>	<p>Please refer to the footnotes and references in the summary/background section and the Reference section at the end of this document.</p>
<p>Statement of continuing consistency to the IRF Fishery Standard</p>	<p>The fishery continues to remain consistent with the standard.</p>

7.6.2 Clause 1.2 Research and Assessment

1.2 Research and Assessment

Summary of relevant changes:

Cod is regarded as a domestic stock and assessed as such. The assessment is based on catches in numbers at age, landings in tonnes, and abundance indices from the bottom trawls surveys in the spring and the autumn. The total amounts landed is provided by the Directorate according to the landings reported by landing sites. There is a well-organized system for sampling of catches and the sampling appears generally adequate. The assessment method was changed and approved by ICES in a benchmark revision in 2020-21. The present method is an age-disaggregated forward projecting stock and catch model that is fitted to the data. There was no fundamental change in the method as such, the revision was partly to improve known weaknesses and partly a practical change to a more orderly code. The changes led to better diagnostics, in particular less retrospective deviations, but reduced the estimate of SSB by up to 20%, and increased the estimate of fishing mortality accordingly. From 2021 to 2022 there was hardly any retrospective difference (Figure 44). These revisions led to lower TAC recommendation in the short term, but not to alterations in the harvest rule. The stock biomass still is estimated to be well above precautionary bounds, but the harvest rate now appears to be above the target. The main results of the assessments are shown below

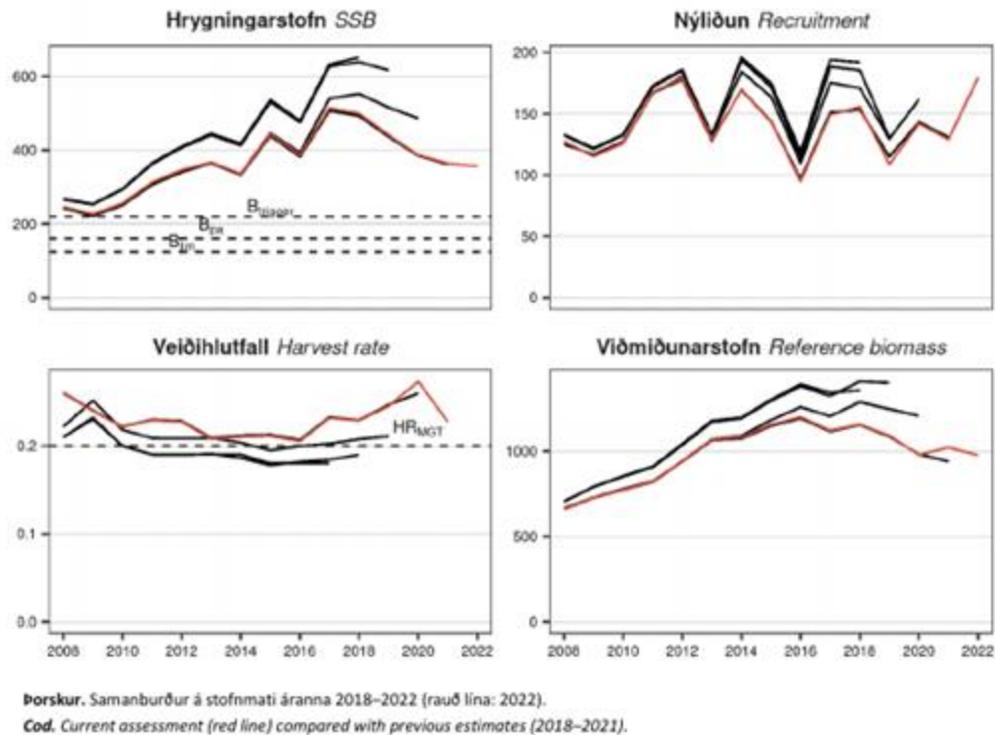


Figure 42. Main outcome of the FMRI assessment in 2022 compared with previous years¹⁰⁹.

References:

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

Statement of continuing consistency to the IRF Fishery Standard

The fishery continues to remain consistent with the standard.

109 <https://www.hafogvatn.is/static/extras/images/01-cod1325960.pdf>

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

<p>1.3 Stock under Consideration, Harvesting Policy and the Precautionary Approach including:</p> <p>1.3.1 The precautionary approach</p> <p>1.3.2 Management targets and limits</p> <p>1.3.2.1 Harvesting rate and fishing mortality</p> <p>1.3.2.2 Stock biomass</p> <p>1.3.2.3 Stock biology and life-cycle (structure and resilience)</p>			
<p>Summary of relevant changes:</p>	<p>The precautionary approach is implemented by applying a harvest rate of 0.20 (TAC/Biomass at age 4+ in the year prior to the quota year). This harvest rate has been shown in simulations to carry a low (well under 5%) risk of reaching the precautionary limit biomass. Precautionary reference points have been updated to current ICES standards. They are tabulated below. None of these precautionary and MSY reference points are used directly in the harvest rule, but the rule is regarded as precautionary as it leads to a less than 5% probability of bringing SSB below Btrigger, which is far above Blim.</p> <p>The management target is to constrain exploitation by applying a harvest rate of 0.20, with a reduction if SSB is below a trigger value of 220 kt. A specific biomass target is considered redundant, and not included in the rule. However, when the current rule was introduced in 2010, one objective was to keep SSB above 220 kt, which was the point estimate at the time. Since then, the SSB has been well above that target. The harvest rule for cod is unchanged since 2010. It was re-evaluated and endorsed by ICES at the benchmark process in 2021. The harvest rule is :</p> <table border="1" data-bbox="397 997 1453 1312"> <tr> <td data-bbox="397 997 576 1312">Management plan</td> <td data-bbox="576 997 1453 1312"> <p>The Icelandic Ministry of Industries and Innovation has a fisheries management plan for Icelandic cod (MII, 2015). The plan, which aims at providing maximum sustainable yield, was re-evaluated by ICES, found to be consistent with both the precautionary principle and ICES MSY approach (ICES, 2021a). According to the management plan, the TAC for the fishing year Y/Y + 1 (1 September of year Y to 31 August of year Y + 1) is calculated as follows:</p> $TAC_{Y/Y+1} = \frac{\min\left(\frac{SSB_Y}{MGT B_{trigger}}, 1\right) HR_{mgt} B_{4+,Y} + TAC_{Y-1/Y}}{2}$ <p>where B_{4+,Y} is the biomass of cod aged 4 and older in year Y and MGT B_{trigger} = 220 000 tonnes.</p> <p>The expected range of realized harvest rate (HR) following the management plan (HR_{mgt}) is between 0.15 and 0.27 (ICES, 2021a).</p> </td> </tr> </table> <p>Taking the TAC midway between the current estimate and the previous TAC is a stabilizer. However, according to MFRI¹¹⁰, in simulations for evaluating the rule, the catch stabilizer has not been applied if SSB < Btrigger. This also appears in the ICES advice on the rule.¹¹¹ In practical management, this situation has never occurred since the rule was adopted, and the probability of reaching Btrigger is estimated to be small.</p> <p>The management plan has a target for exploitation (HR=0.2). A biomass target is considered redundant and not defined.</p> <p>Further protective measures include area closures (permanent and temporary), mesh size regulations and rules for landing of undersized fish. These have not been changed, except that the management of temporary closures was moved from MFRI to the Directorate last year.</p>	Management plan	<p>The Icelandic Ministry of Industries and Innovation has a fisheries management plan for Icelandic cod (MII, 2015). The plan, which aims at providing maximum sustainable yield, was re-evaluated by ICES, found to be consistent with both the precautionary principle and ICES MSY approach (ICES, 2021a). According to the management plan, the TAC for the fishing year Y/Y + 1 (1 September of year Y to 31 August of year Y + 1) is calculated as follows:</p> $TAC_{Y/Y+1} = \frac{\min\left(\frac{SSB_Y}{MGT B_{trigger}}, 1\right) HR_{mgt} B_{4+,Y} + TAC_{Y-1/Y}}{2}$ <p>where B_{4+,Y} is the biomass of cod aged 4 and older in year Y and MGT B_{trigger} = 220 000 tonnes.</p> <p>The expected range of realized harvest rate (HR) following the management plan (HR_{mgt}) is between 0.15 and 0.27 (ICES, 2021a).</p>
Management plan	<p>The Icelandic Ministry of Industries and Innovation has a fisheries management plan for Icelandic cod (MII, 2015). The plan, which aims at providing maximum sustainable yield, was re-evaluated by ICES, found to be consistent with both the precautionary principle and ICES MSY approach (ICES, 2021a). According to the management plan, the TAC for the fishing year Y/Y + 1 (1 September of year Y to 31 August of year Y + 1) is calculated as follows:</p> $TAC_{Y/Y+1} = \frac{\min\left(\frac{SSB_Y}{MGT B_{trigger}}, 1\right) HR_{mgt} B_{4+,Y} + TAC_{Y-1/Y}}{2}$ <p>where B_{4+,Y} is the biomass of cod aged 4 and older in year Y and MGT B_{trigger} = 220 000 tonnes.</p> <p>The expected range of realized harvest rate (HR) following the management plan (HR_{mgt}) is between 0.15 and 0.27 (ICES, 2021a).</p>		

110 Communicated at web meeting with MFRI. Nov. 4, 2021

111 https://ices-library.figshare.com/articles/report/Iceland_request_for_a_re-evaluation_of_the_management_plan_for_cod_in_Icelandic_waters/18638597?backTo=/collections/ICES_Advice_2021/5796932

1.3	Stock under Consideration, Harvesting Policy and the Precautionary Approach including:
1.3.1	The precautionary approach
1.3.2	Management targets and limits
1.3.2.1	Harvesting rate and fishing mortality
1.3.2.2	Stock biomass
1.3.2.3	Stock biology and life-cycle (structure and resilience)
References:	Please refer to the footnotes and references in the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

7.6.4 Clause 1.4 External Scientific Review

1.4	External Scientific Review
Summary of relevant changes:	ICES ¹¹² 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 procedures and management plan have been evaluated and endorsed by ICES. The last revision was in 2021.
References:	Please refer to the footnotes and references in the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

7.6.5 Clause 1.5 Advice and Decisions on TAC

1.5	Advice and Decisions on TAC
Summary of relevant changes:	Stock assessment and advice, including advice on harvest rules, TACs and reference points is provided by ICES. The process involves all relevant nations. The advice is published on the MFRI website once it is ready ¹¹³ . Normally, the MFRI advice follows the ICES advice. The Minister of Fisheries and Agriculture decides on the TAC of the cod stock for each fishing year (Sept –Aug) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned above. Formally, the Minister has the authority to deviate from the advice, but this does not happen in practice. The Icelandic cod stock is a domestic stock confined to Icelandic waters, and is managed by Iceland alone.
References:	Please refer to the footnotes and references in the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

112 <https://www.ices.dk/Pages/default.aspx>

113 <https://www.hafogvatn.is/static/extras/images/01-cod1325960.pdf>

Section 2. Compliance and Monitoring

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

2.1	Implementation, Compliance, Monitoring, Surveillance and Control																											
<p>Summary of relevant changes:</p>	<p>The Icelandic Directorate of Fisheries, or Fiskistofa¹¹⁴, is an independent administrative body responsible to the Fisheries Minister, in charge of the day to day implementation of the Act on Fisheries Management and related legislation, for day-to-day management of fisheries and for supervising the enforcement of fisheries management rules.</p> <p>The Icelandic Coast Guard¹¹⁵ is responsible for control at sea, both of the catches and the quality of the vessels. It performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters, and monitoring of fishing within the zone in consultation with the Marine and Freshwater Research Institute and Ministry of Industries and Innovation. The Coast Guard operates the Icelandic Maritime Traffic Service within its operations centre which has a key role in ensuring safety at sea, but can also take action if the behaviour of a fishing vessels is unusual.</p> <p>The Fisheries Management Act sets out penalties for the violation of its provisions, or rules adopted by virtue of it, which are provided in detail in the Act Concerning the Treatment of Commercial Marine Fish Stocks (Act No. 57 1996¹¹⁶). Provisions of the Act on a Special Fee for Illegal Marine Catch¹¹⁷ are also applied as appropriate. Penalties range from the issue of reprimands by the Directorate of Fisheries and the suspension of commercial fishing permits to fines and, in cases of serious or repeated deliberate violation, imprisonment for up to six years (Article 24 and 25 of Act No. 116/2006).</p> <p>Summary of relevant updates in 2022</p> <p>Temporary/sudden closures (generally 2 weeks triggered by high juvenile abundance on fishing grounds) are announced by the Coastguard on VHF radio on a specified wavelength and on the radio before the news and weather. They are also published on the MFRI website. The short-term closure monitoring (and issuing of) was transferred to Fiskistofa in the fall of 2020. Some regulation regarding the short-term closures was also changed in 2020, whereby the trigger size limit was increased for cod, which led to significant decrease in the number of closures. An updated table as provided by the management authorities (MFRI and Fiskistofa) is shown below.</p> <p>Table 11. Short term closures in Iceland for the years 2018-2022.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Species</th> <th>Number of closures</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td>Cod</td> <td>90</td> </tr> <tr> <td>2018</td> <td>Saithe</td> <td>4</td> </tr> <tr> <td>2018</td> <td>Shrimp</td> <td>2</td> </tr> <tr> <td>2018</td> <td>Haddock</td> <td>1</td> </tr> <tr> <td>2019</td> <td>Cod</td> <td>50</td> </tr> <tr> <td>2019</td> <td>Haddock</td> <td>1</td> </tr> <tr> <td>2020</td> <td>Cod</td> <td>9</td> </tr> <tr> <td>2020</td> <td>Haddock</td> <td>1</td> </tr> </tbody> </table>	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
Year	Species	Number of closures																										
2018	Cod	90																										
2018	Saithe	4																										
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2020	Cod	9																										
2020	Haddock	1																										

¹¹⁴ <https://www.fiskistofa.is/umfiskistofu/>

¹¹⁵ <http://www.lhg.is/english>

¹¹⁶ <https://www.althingi.is/lagas/149a/1996057.html>

¹¹⁷ <https://www.althingi.is/lagas/149a/1992037.html>

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

2020	Greenland halibut	1
2021	Sea cucumber	2
2021	Cod	3
2021	Haddock	1
2022	Cod	2
2022	Haddock	2
2022	Sea cucumber (quota finished)	1

Directorate Inspections at Sea

Days spent by Fisheries Directorate inspectors at sea inspecting vessels is shown in Table 8. The number has remained consistent with previous years.

Enforcement by Fiskistofa

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

Table 12. Fiskistofa suspected violations in 2020 and 2021. Source: Fiskistofa 2020¹¹⁸ and 2021 Annual Report¹¹⁹. Note, the information between 2020 and 2021 is not directly comparable, and offenses of a similar nature may have been combined into one case.

Suspected violation	2020 No.	2021 No.
Veiðar án leyfis / Fishing without a permit	14	1
Brottkast / offences	11	70
Vigtun afla / weighing of catch	24	2
þar af vigtun vigtarleyfishafa / of which the weighing by the weighing licensee	9	3
Framhjálföldun / landing	6	1
Afladagbók / logbook	40	91
Vanskil afladagbókar / submitting logbook late	470	
Veiðar án aflaheimilda / Fishing with insufficient catch quotas	6	1
Mál vegna umframafra / Cases due to excess catch * mostly daily allowance in coastal vessels	1321	1456
Lax og silungsveiði / salmon and trout fishing	24	13
Undirmálsfiskur / bottom fish fishing	4	11
Röng tilgreining tegunda / Incorrect identification of species	3	3

¹¹⁸ https://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

¹¹⁹ <https://www.fiskistofa.is/media/arsskyrslur/arsskyrsla-2021.pdf>

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

Grásleppuveiðar / Lump sucker fishing	13	2
Strandveiðar / coastal fishing	42	2
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	16

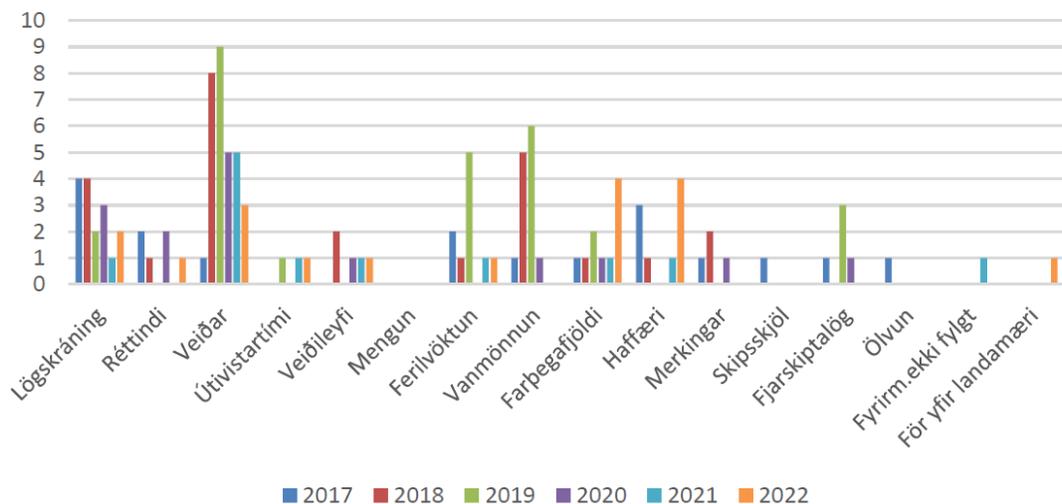
Enforcement by the Icelandic Coast Guard

During the remote audit in October 2022 the ICG reported that surveillance in 2020 and 2021 and 2022 was challenging due to the COVID 19 pandemic. By beginning of March 2020, severe restrictions on direct interactions between people were imposed. This restricted surveillance possibilities on board vessels for Maritime Surveillance and Control agency such as the Icelandic Coast Guard. All restrictions were lifted by February 25th 2022.

In spite of the Coast Guard efforts the pandemic has had its impact. Fewer inspections and boardings of vessels resulted in less measuring of fish, which was reflected in fewer Short Time Closures in 2020 and 2021 and 2022 (see Table 7) and none based on Fisheries inspections by ICG. Instead of regular boardings the ICS used more surveillance drones, in partnership with Fiskistofa. Trials with a bigger drone from EMSA (type Schiebel S 100 Camcopter, Figure below) proved to be a lesson for future use of larger drones operating from a vessel. The trials with the EMSA drone tied up, in part, the activities of the vessels which can in part explain fewer boardings. However, the drones are an extension of the vessel and information is used to inspect vessels more selectively than doing random checks. In the summer of 2022 the ICG recorded several incidents of inspections after anomalies were spotted by the drone crews.

In terms of overall infringements, 11 reports of apparent infringements were reported in 2022, 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 2022, included: Lögskráningar /Crew registry, Réttindi /License, Veiðar /Fisheries, Veiðileyfi /Fishing permit, Ferilvöktun /Vessel monitoring, Farþegafjöldi /Passengers, Haffæri /Sea worthiness and a new addition För yfir landamæri /Border Control. These are shown below (until the 1st September 2022) compared to historical data up to 2017.

Kæruskýrslur, brotaflokkar 2017-2022 (til enda Sept)



2.1	Implementation, Compliance, Monitoring, Surveillance and Control
	<p>Figure 43. Overview of ICG infringement reports in 2017- (1st September) 2022. Source: provided by the ICG on the 8th of November 2022.</p> <p>For 2022, infringements on Passenger and Sea Worthiness are most common 4 each, Fishing is next with 3 Apparent Infringements. No apparent infringement were reported in 2022 in the following categories; Mengun /Pollution, Vanmönnun /Manning, Merkingar /Markings, Skipsskjöl /Ships documents, Fjarskiptalög /Communications, Fyrim.ekki fylgt /Instructions not obeyed or Ölvun /intoxication.</p>
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

7.6.7 Clause 2.2 Concordance between actual Catch and allowable Catch

2.2 Concordance between actual Catch and allowable Catch	
<p>Summary of relevant changes:</p>	<p>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.746/2016¹²⁰. These must be electronic (e-logs). Small vessels used to use paper logbooks until late 2020 when regulation 298/2020¹²¹ implemented the use of an electronic app. The App also called Afladagbókina or catch diary^{122 123} automatically records the location of the boat during fishing and the captains then records the catch, its condition and bycatch. Catch data must be entered on the e-log using a Fisheries Directorate-approved programme and all changes to entries must be visible and traceable. It is prohibited to start a fishing trip without a logbook on board. Vessel masters are required to record the following information in their logbooks:</p> <ul style="list-style-type: none"> • 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. <p>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)⁵⁵.</p> <p>2022 updates</p> <p>The Minister of Fisheries and Agriculture decides on the TAC of the cod stock for each fishing year (Sept –Aug) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned below. Before catch is allocated, proportions of the TAC of some species is removed for</p>

¹²⁰ <https://www.stjornartidindi.is/Advert.aspx?RecordID=42a16a67-60a7-4ae7-ad7c-0f53fc254654>

¹²¹ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹²² <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

¹²³ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

2.2 Concordance between actual Catch and allowable Catch

various reasons such as for the coastal fisheries which any small boat in possession of a licence may access, for research purposes or for chartered angling vessels.

For the last decade, both before and after the introduction of the harvest rule in 2017, quotas have been set according to the scientific advice with minor exceptions. Since the introduction of the HCR in the fishing year 2017– 2018, the scientific advice has been according to the rule. The Icelandic TAC is set equal to the recommended TAC without taking the expected catch by other nations (Faroes and Norway) into account (see table below).

The actual catch has exceeded the TAC in most years, up to about 10% above the recommended. A likely partial cause is transfers between years (Figure 11). Transfer between species is not a likely cause: a cod quota can be used to cover catches of other species (negative transfers) but cod catches cannot be covered by quotas from other species. Some deviations are due to catches by other nations that are not considered when setting national quotas.

Table 13. TACs and actual catches, according to MFRI (source: MFRI, 2022 advice¹²⁴).

Fiskveiðíár Fishing year	Tillaga ¹⁾ Recommended TAC ¹⁾	Aflamark National TAC	Afli Íslandinga Catches Iceland	Afli annarra þjóða Catches others	Afli alls Total catch
2010/2011	160 000	160 000	164 891	2 309	167 200
2011/2012	177 000	177 000	182 646	2 247	184 889
2012/2013	196 000	195 000	210 489	2 011	212 500
2013/2014	215 000	215 000	223 977	2 183	226 160
2014/2015	218 000	218 000	221 069	1 967	223 036
2015/2016	239 000	239 000	249 945	2 343	252 228
2016/2017	244 000	244 000	234 657	3 006	237 663
2017/2018	257 572	257 572	267 140	3 249	270 389
2018/2019	264 437	264 437	262 893	33 08	265 976
2019/2020	272 411	272 411	269 327	2 784	272 111
2020/2021	256 593	256 593	269 413	2 725	272 138
2021/2022	222 373	222 373			
2022/2023	208 846				

¹⁾ 20 % aflaregla – 20% harvest control rule.

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

Statement of continuing consistency to the IRF Fishery Standard

The fishery continues to remain consistent with the standard.

7.6.8 Clause 2.3 Monitoring and Control

2.3 Monitoring and Control including:

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

Summary of relevant changes:

Commercial vessels participating in the fishery require a permit issued by the Fisheries Directorate. This is a requirement of the Fisheries Management Act No.116/2006. These permits represent the

¹²⁴ <https://www.hafogvatn.is/static/extras/images/01-cod1325962.pdf>

<p>2.3 Monitoring and Control including:</p> <p>2.3.1 Vessel registration and catch quotas</p> <p>2.3.2 Fishing vessel monitoring and control systems</p> <p>2.3.3 Catches are subtracted from relevant quotas</p> <p>2.3.4 Rules are enforced</p> <p>2.3.5 Analysis is carried out</p>	<p>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.</p> <p>Catches by vessel are monitored and recorded in near real-time in a central database maintained by the Fisheries Directorate¹²⁵. The official weight of the catch is subtracted from that vessels individual quota share for a particular 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:</p> <ol style="list-style-type: none"> 1. Allocated quota (initial allocation of quota from the overall TAC based on no. of shares) 2. Compensations (quota gained/lost through compensations) 3. Quota transferred from the previous year (this may be a negative balance) 4. Quota transferred between vessels (a negative balance indicates an outward transfer of quota (i.e. quota transferred to other vessels) while a positive balance indicates an inward transfer of quota (i.e. quota gained from other vessels) 5. Allowed catch (the sum of 1 to 4 above) 6. Catch (vessels landings in the season to date of that species) 7. Balance (Allowed catch - Catch) 8. Overfished <p>Specific data on each Icelandic quota species, its allocation to ITQ holders, transfer information, balances and catches to date is available at http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en. Registered catches are based on information from ports of landing and information on catches exported unprocessed. The catch statistics are published, subject to change, once they have been compared to submitted logbooks and reports from buyers, and are available on the Fisheries Directorate website. Accordingly, information on the size and composition of the fleet of fishing vessels is available and documented, and the catch quota of each vessel or vessel group, along with the fishing year is recorded in the official central database (GAFL) in a transparent manner and is publicly accessible.</p> <p>The Icelandic Coast Guard, working closely with the Fisheries Directorate, administers an integrated monitoring, control and surveillance system which covers the activities of Icelandic and foreign</p>
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¹²⁵ <http://www.fiskistofa.is/veidar/aflaheimildir/aflahlutdeildalisti/>

<p>2.3 Monitoring and Control including:</p> <ul style="list-style-type: none"> 2.3.1 Vessel registration and catch quotas 2.3.2 Fishing vessel monitoring and control systems 2.3.3 Catches are subtracted from relevant quotas 2.3.4 Rules are enforced 2.3.5 Analysis is carried out 	<p>fishing vessels, using VMS for all Icelandic vessels and for all foreign vessels. Fishing gear is subject to inspection, as well as the composition of the catch and its handling onboard the fishing vessels. At-sea inspections are undertaken during boardings by the Coast Guard and on fishing trips accompanied by the inspectors of the Fisheries Directorate. The Coast Guard undertakes unannounced inspections at sea and check logbooks during these boardings. Fisheries Directorate inspectors also make unannounced checks of logbooks during port inspections. The Coast Guard uses several different but complementary electronic vessel monitoring systems including satellite-based systems comprising VMS and use of satellite imagery, the monitoring of coastal activity through a dedicated land-based very high frequency (VHF) system and the use of the Automatic Identification System (AIS), and more recently drones.</p> <p>Deviations and flexibility measures</p> <p>Data related to landings are processed in the Directorate’s database and catches are subtracted from vessels’ quotas. The system is designed such that reports are received in near real-time so that the Directorate can act quickly if vessels are approaching the end of their quotas. In addition, vessels are aware or can easily check online their current quota status for a particular species. Deviations where they occur can sometimes be rectified using the flexibility within the system (e.g. by using inter-annual, inter-vessel or inter-species transfers to cover catches of a species for which the vessel did not already have quota, or by purchase of additional quota if possible). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines¹²⁶.</p> <p>In addition to the landing, weighing and registration system for catches, export documentation provides an independent comparative check on catch quantities. Analysis of catches includes the comparison of reported catches with the amount of sold or exported products to verify independently that reported landings aligned accurately with those reported. If comparison reveals discrepancies in reported and actual landings received from quayside weighing by registered weighers corrective action is taken as appropriate and Fiskistofa can send inspectors to verify for issues.</p> <p>Updates for 2022</p> <p>In late 2021 Fiskistofa reported that a new data department has been created to allow for further data analysis relating to catch recording and day to day implementation of management measures, ultimately to improve the ability to detect discrepancies and enforce regulations.</p> <p>Aside from the above, the monitoring and control systems remain largely unchanged since the previous surveillance. The only other update for 2022 relates to the progress to address the minor non-conformance raised against Clause 2.3.2.4 .</p>
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¹²⁶ <http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Vidurlog>

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

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. 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 298/2020¹²⁷. The App also called Afladagbókina or catch diary^{128 129} 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. Updates from 2021 (previous surveillance audit) and 2022 (current surveillance audit) are provided below for full context:

2021 Updates. In November 2021, the system continued to be used in the small vessel sector and catch with bycatch data being collected by Fiskistofa and sent to MFRI for management purposes. MFRI staff reported that data from the App is in the process of being made available to the MFRI through MFRI/Fiskistofa IT staff collaboration. Fiskistofa also reported as part of the 2nd surveillance audit that since the beginning of the App's implementation it has been mandatory to register all catch and bycatch according to regulation 298/2020 and the data is being received by the authorities. Their inspectors have been busy training fishermen and captains at the quaysides during landing, and their helpline was quite busy in the beginning of the coastal fleet season. Also, one physical meeting was held in Akranes with coastal fishermen. A tutorial video on the use of the App was also published on the Fiskistofa website <https://www.fiskistofa.is/ymsaruppl/tilkynningar/afladagbokarapp-myndband> and on the Fiskistofa Facebook site¹³⁰. Furthermore, a traceability component to the App has been implemented in April 2021 which is being used to further help with the detection of discrepancies in catch records and to allow better traceability across the supply chain. This traceability component is currently subject to further development.

2022 Updates. The App is no longer operated/managed by Fiskistofa. The companies Aflarinn, Trackwell and Fontos are now operating the small vessels App. Fiskistofa noted during the October 2022 on site meeting that this data is being sent to the MFRI. However, the MFRI stated that although work is ongoing to getting access to that data stream, staff in charge of bycatch analysis (i.e. Dr Guðjón Már Sigurðsson) does not yet have access to the data from the App. All in all, since

¹²⁷ <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹²⁸ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skrangu-afla>

¹²⁹ <https://www.mbl.is/200milur/frettir/2020/08/31/oll-aflaskraning-rafraen-fra-og-med-morgundegnum/>

¹³⁰ <https://www.facebook.com/Fiskistofa-1151844504903713/videos/304666984614930/>

<p>2.3 Monitoring and Control including:</p> <p>2.3.1 Vessel registration and catch quotas</p> <p>2.3.2 Fishing vessel monitoring and control systems</p> <p>2.3.3 Catches are subtracted from relevant quotas</p> <p>2.3.4 Rules are enforced</p> <p>2.3.5 Analysis is carried out</p>	
	<p>implementation of the App it is not clear if bycatch information a) is being collected and b) received by the relevant science authorities in charge of data analysis.</p> <p>Status: Open, Corrective Actions in place to be reviewed annually in subsequent audits. Progress is deemed to be behind schedule and a revised corrective action has been requested from the Client.</p> <p>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.</p>
<p>References:</p>	<p>Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.</p>
<p>Statement of continuing consistency to the IRF Fishery Standard</p>	<p>The fishery continues to remain consistent with the standard, but we note the non-conformance highlighted above.</p>

Section 3. Ecosystem considerations

7.6.9 Clause 3.1 Guiding Principle

3.1	Guiding Principle - 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.
Summary of relevant changes:	<p>Associated species catch and bycatch to the fishery</p> <p>The Icelandic groundfish fishery is multispecies in nature with vessels simultaneously targeting numerous species. With regards to catches, most commercially fished species in Iceland are now part of the ITQ system. Discarding is prohibited and comparison between observer measured catch compositions and self-reporting by fishers ensures that a high level of compliance with the ban on discarding is maintained. The species listed in Table 11 are those that were identified during the 2019-2020 re-assessment¹³¹. A status update on each of these species has been provided in this report but in summary the cod fishery appears not to have any significant negative effects on any of the listed species but one, spotted wolffish, which is the subject of an open non-conformance and related corrective action. Please refer to Table 10 for further information on the status of all bycatch species, including spotted wolffish.</p> <p>Endangered, Threatened and Protected (ETP) and vulnerable species interactions</p> <p>The MFRI has not provided any further bycatch data for marine mammals and seabirds. The latest data from 2016 to 2019 was provided at the previous surveillance. However, observed bycatch by onboard inspectors and in surveys in 2020 was reported in the 2021 ICES Working Group on Bycatch (WGBYC) report¹³². From the ICES 2021 WGBYC report the authors reported:” In 2020 highest bycatch levels were reported for common eider (105), black guillemots (82) and common guillemots (39). Harbour porpoise was the largest proportion of cetacean bycatches in 2019 and 2020 (21 and 23 respectively).”.</p> <p>As part of the 2022 ICES WGBYC report¹³³ the authors reported:” In the Iceland Sea Ecoregion in 2021, 134 days at sea were monitored in nets and 480 days in bottom trawls. All monitoring was performed by at-sea observers. Ten bird species were recorded in nets, including 3 black guillemots (<i>Cephus grille</i>), 1 long-tailed duck (<i>Clangula hyemalis</i>), 4 northern fulmars (<i>Fulmarus glacialis</i>), 1 red-throated diver (<i>Gavia stellata</i>), 1 northern gannet (<i>Morus bassanus</i>), 2 European shags (<i>Phalacrocorax aristotelis</i>), 2 cormorants (<i>Phalacrocorax carbo</i>), 3 common eiders (<i>Somateria mollissima</i>), 277 guillemots (<i>Uria aalge</i>) and 1 Brünnich's guillemot (<i>Uria lomvia</i>). 36 harbour porpoises, 2 grey seals, 2 harp seals (<i>Pagophilus groenlandicus</i>), 2 white-beaked dolphins (<i>Lagenorhynchus albirostris</i>) and 7 harbour seals were reported in nets. For bottom trawlers bycatch was reported for one bird species, with 2 <i>Uria aalge</i> bycaught. Additional monitoring data with at-sea observers with no bycatch incidence was reported for dredges (9 days), longlines (2 days), surrounding nets (11 days) and traps (6 days). Bycatch of several species of fish were reported in the ecoregion from 4 different taxa, including <i>Etmopterus spinax</i> and <i>Chimaera monstrosa</i> captured in bottom trawls. “</p>

¹³¹ <https://www.responsiblefisheries.is/media/1/irf-cod-re-assessment-report-final-03feb2020.pdf>

¹³² ICES (2021): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.9256> https://ices-library.figshare.com/articles/report/Working_Group_on_Bycatch_of_protected_Species/18621773

¹³³ ICES (2022): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.21602322.v1>

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Relevant updates for species for which data is available is provided below. All the species below were identified and analyzed as vulnerable or ETP species in the full assessment that resulted in the current certificate for this fishery (see relevant audit report at <https://www.responsiblefisheries.is/certification/certified-fisheries>).

Common loon

Common loon was the second species part of NC#2 assigned against Clause 3.1.1 (the first species is assessed within [Table 10](#)). **Common loon was the second species part of NC#2 assigned against Clause 3.1.1.** In December 2022, the MFRI reported that no further common loons (*Gavia immer*) have been recorded as bycatch in the fisheries under assessment (i.e. cod, haddock, Golden redfish, ling, common ling, tusk, ISS herring). The last 3 birds were encountered in 2016. In the 1st surveillance, the audit team determined that because the incidental catch was based on a single event, rather than multiple, there is some basis to hypothesize that gillnet impacts may be only occasional. Furthermore, the assessment from the Iceland Institute of Natural History (INH) Red List Classification states that the population of common loon in Iceland (currently estimated at 279 pairs) is presumed to be 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-Sléttu, near Mývatn and in Veiðivötn. At this stage, significant risk from fishing appears to be relatively limited due to the lack of positive records but monitoring will continue at the next surveillance audit to check if there is updated information on this species status and/or data on potential bycatch. The WGBYC 2021 report¹³⁴ mentions one catch of *Gavia immer* (part of Non-Conformance #2) in 2019 and one in 2020, respectively, by lumpfish nets by onboard observers. Three individuals were recorded as bycatch in the Iceland Sea in 2021, apparently all caught in lumpfish nets (ICES WGBYC 2022¹³⁵).

Harbour Porpoises (*Phocoena phocoena*)

Harbour porpoises are classified as Least Concern in the IUCN Red List¹³⁶ (population trend unknown, last assessed in 2020). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)¹³⁷. 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 2009–2013¹³⁸ and down to about 750 animals in 2014-2015.

Results based on close kin mark recapture genetics indicates that the population has increased substantially in recent years.¹³⁹

¹³⁴ ICES (2021): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.9256> https://ices-library.figshare.com/articles/report/Working_Group_on_Bycatch_of_protected_Species/18621773

¹³⁵ ICES (2022): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.21602322.v1>

¹³⁶ <https://www.iucnredlist.org/species/17027/50369903>

¹³⁷ <https://www.ni.is/node/27406>

¹³⁸ 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>

¹³⁹ North Atlantic Marine Mammal Commission and the Norwegian Institute of Marine Research. (2019). Report of Joint IMR/NAMMCO International Workshop on the Status of Harbour Porpoises in the North Atlantic. Tromsø, Norway. https://nammco.no/wp-content/uploads/2020/03/final-report_hpws_2018_rev2020.pdf

3.1 Guiding Principle - 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.

The 2019 Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise (19-22 March 2019)¹⁴⁰ reported the following about the Icelandic harbour porpoise population. After reviewing the assessment and noting the recent decline in bycatch, 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.

In 2022 the same group provided the following update¹⁴¹:” Sigurdsson indicated that a population estimate of harbour porpoise in Iceland waters was available from an aerial survey conducted in 2007, but noted that the survey was incomplete and the abundance estimate obtained then was probably an underestimate. Sigurdsson informed the WG about plans to conduct an aerial survey in July 2023 to obtain updated abundance estimates for harbour porpoise in Iceland. The group commanded the planning of such a survey. Given that abundance estimates from the NASS surveys may not be usable for harbour porpoise in Iceland, the group agreed that the 2023 abundance estimate be the one used in the future Icelandic assessment.

Sigurdsson indicated that previous work using close kin Mark-Recapture genetics and presented at the 2018 NAMMCO/IMR International Workshop on harbour porpoise indicated that the Icelandic population was increasing. Sigurdsson informed the WG that around 500 animals were by-caught annually in the Icelandic lump sucker fishery and 1500-2000 in the cod fishery, noting that by-catch levels were much higher in the past. Sigurdsson informed the WG that Iceland was also conducting isotopic work and investigating the diet of harbour porpoise using samples from by-caught and stranded animals. Life history parameters and age distribution histograms are possible to infer from these samples. The group recommended that an assessment for Iceland be made when the new abundance estimate becomes available.

Sigurdsson informed the WG of the by-catch time series available in Iceland, including some back-calculated by-catch estimates, and presented at the international harbour porpoise workshop in 2018. As in the case of Norway, the group recommended Iceland to generate the best back-calculated bycatch estimates (i.e., generate a time series going back to the beginning of the fishery) for the upcoming Icelandic assessment, planned for 2024.”

Harbour seals

The MFRI 2021 advice for harbour seals¹⁴² indicates that the 2020 harbour seal census resulted in a population estimated of 10,319 animals (95% confidence intervals: 6,733-13,906). The current population estimate is 69% lower than the first abundance estimate from 1980 and the estimate is 14% under the management objective of 12 thous. Animals (Hafrannsóknastofnun 2021). In 2019, new regulation regarding seal hunting in Iceland was enacted (Atvinnuvega- og nýsköpunarráðuneytið 2019). All seal hunting is banned, but it is possible to obtain an exemption for traditional hunt. It is also forbidden to sell Icelandic seal products. Bycatch in gillnets is probably the highest mortality risk for harbour seals in Iceland currently. Limited data are available on seal

¹⁴⁰ NAMMCO (2019). Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise, 19-22 March, Copenhagen, Denmark. https://nammco.no/wp-content/uploads/2019/02/final-report_hpwg-2019.pdf

¹⁴¹ NAMMCO-North Atlantic Marine Mammal Commission (2022). Report of the Scientific Committee Working Group on Harbour Porpoise. November 2022, Oslo, Norway. https://nammco.no/wp-content/uploads/2023/01/final-report-hpwg-2022_with-exsum.pdf

¹⁴² <https://www.hafogvatn.is/static/extras/images/radgjof-landselur20201286028.pdf>

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bycatch, but data collected by on-board observers of the Directorate of Fisheries, and in the MFRI gillnet survey, indicate that on average, 1389 (coefficient of variation, CV=35) harbour seals have been bycaught annually in the lumpfish fishery between 2014 and 2018. Bycatch in cod gillnet fishery and bottom trawls is less common and more uncertainty associated with the bycatch estimates in those fisheries. Between 2014 and 2018, it has been estimated that annually, 15 harbour seals were bycaught in cod gillnet fisheries (CV=102) and 17 harbour seals in bottom trawls (CV=100) (Hafrannsóknastofnun, 2019). Negative effects from the cod gillnet fisheries (and associated fisheries that land fish in those nets) are considered to be very limited.

Other marine mammals

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

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

Pingers testing

After unsuccessful trials with banana pingers and PALs in 2016-2018, PALs with a modified signal were tested in the Icelandic cod gillnet fishery in 2020. These PALs had a signal developed to emulate the signal of an out of production pinger, the Dukane 1000. The random wide-band sweep characteristic of the original PAL was maintained. Signal peaks are at 10, 50, 70 and 130kHz with a source level of 157dB. This signal is aimed at deterring porpoise rather than communicating with them as in the original PALs. The device was tested over two weeks, where over 3000 50m nets were hauled. Half of the net sets were equipped with the devices, while the other half acted as control. A total of 15 marine mammals were caught in the trial, 14 harbour porpoises and one harbour seal. Significant difference in the number of harbour porpoises was observed between the two treatments ($t = 3.78, p = 0.00017$), as all 14 of the harbour porpoises were caught in the control sets, while none were caught in the PAL equipped sets. The single harbour seal bycaught was caught in a PAL equipped set. These results suggest that this configuration of the PAL might be effective in reducing harbour porpoise bycatch in Icelandic waters. There have been no further updates since then.

Sharks

Generally speaking, landed catches of sharks remain quite small. Some catch of leaf scale gulper sharks has been recorded, last in 2016. Survey trends are presented below from MFRI data. Grey skate (*Dipturus flossada / batis*) survey abundance is variable but has been on average relatively stable in recent years. The MFRI spring survey caught 56 t in 2019, 43 t in 2020, 32 t in 2021 and 69 t in 2022. Fishery landed catch of Grey skate was 160 t in 2020 and 158 t in 2021. Landed catch of dogfish (*Squalus acanthias*) was 1 t in 2019 and 3 t in 2020, and 0.9 t in 2021. Survey trends are very sporadic. No Greenland sharks (*Somniosus microcephalus*) were caught in the 2020-2022 surveys. Around 16 tonnes of them were landed in both 2020 and 2021. Around 3.6t of porbeagle (*Lamna nasus*) were landed in 2020 and 2.3t in 2021. Porbeagles are rarely caught in surveys, but two were caught in the autumn survey in 2021. No records of basking sharks are available in catch or surveys. Few have been recorded by onboard inspectors, last one in 2005.

Trawl effort spatial extent

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The ICES 2022 Icelandic ecosystem overview report¹⁴³ indicates that the main abrasive pressure in the Icelandic Waters ecoregion is caused by mobile bottom-fishing gears (targeting fish, shrimp, and Norway lobster *Nephrops norvegicus*). 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.

The total fishing effort by bottom trawls targeting fish and shrimp has decreased by around 40% in 2000–2014; in the same period the *Nephrops* trawling effort remained at the same level. The decrease in fishing effort varied locally, with decreases mainly being noted on the southern shelf (Subarea 1) and at typical shrimp trawling grounds on the northern shelf (Figure 35, Figure 36). Based on analysis of electronic logbook data an area of about 79000 km² in total was fished with towed bottom-fishing gears in 2013, composing 10% of the ecoregion.

Using vessel monitoring system (VMS) and logbook data ICES estimates that mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category have been deployed over approximately 132 485 km² of the ecoregion in 2018, corresponding to ca. 17.5 % of the ecoregion’s spatial extent (Figure 36). The latter figure (132.485 km²) refers to numbers based on ais/vms data delivered to ICES (different from the previous approach used). It is in conformity with what is reported in mynd 29A (add fish, nephrops and shrimp).¹⁴⁴

The overall bottom trawl fishing effort has been decreasing since the early 2000s and is now at the lowest level.

Habitat mapping, NovasArc project

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)¹⁴⁵. 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

¹⁴³ ICES. 2022. Icelandic Waters ecoregion –Ecosystem overview. In Report of the ICES Advisory Committee, 2022. ICES Advice 2022, Section 11.1, <https://doi.org/10.17895/ices.advice.21731663>

¹⁴⁴ <https://www.hafogvatn.is/static/research/files/hv2021-50.pdf>

¹⁴⁵ <http://norden.diva-portal.org/smash/get/diva2:1304079/FULLTEXT02.pdf>

3.1 Guiding Principle - 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.

historical trawl disturbance may have decreased the amount of suitable habitat for these benthic groups.

Also, a paper was published by Burgos et. al (2020)¹⁴⁶ 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 managerial aspects in 2021. The MFRI highlighted during the November 2021 site visits that Novasarc II is now ongoing and will concentrate on updating predictive models and discuss the output for managerial purposes.

In October 2022 the MFRI highlighted that the NovasArc II project had a stakeholder meeting last September and the final report will be submitted to TemaNord this autumn. Updated models have been prepared including confidence estimation. Such models are increasingly considered in managerial purposes. This work has been introduced to the Ministry of Fisheries although the best use of this work has not been discussed in detail.

Benthos recorded in the MFRI survey

Recording of benthic animals as a bycatch in the autumn MFRI trawl took place for the fifth time in 2020 (Jakobsdóttir et al. 2020¹⁴⁷) (Figure 38). Benthic animals were collected at 105 stations. Benthic animals are classified into species as far as possible, counted and weighed. The amount of benthic animals in tows ranged from 0.028 kg to 97.5 kg and the number of individuals counted in tow ranged from 1 to 1,213 (Fig. 21). The largest number of individuals were fungi. Maximum number of identified species or groups in tow there were 71 species at a station west of Kolbeinseyjarhrygg and the fewest species, a total of 3, occurred two stations in the continental shelf south of the country. At one point west of Reykjanes was the total weight of benthic animals in a tow was 97.5 kg and a total of 50 species, most of which contained 80 kg of coral. Sponges weighed the most at other stations. Six benthic species were identified at the Faroe Islands ridge that have not occurred in previous surveys. A total of over 700 species have been identified from the five autumn surveys since benthos bycatch has been recorded (Figure 38).

The closures that MFRI proposed are being processed at present time (October 2022) by the Ministry of Fisheries. The closures include Hydrothermal vents, Sponge Aggregations mixed with Cauliflower coral ground and Sponge Aggregations on underwater mountains.

Foodweb considerations

The MRI has studied Icelandic cod and its place/relationship in the ecosystem. Capelin is a key forage species in the ecoregion, and promotes an important energy transfer into the ecosystem. Capelin feeds mainly on copepods and euphausiids, and it is one of the most important prey for several

¹⁴⁶ <https://www.frontiersin.org/articles/10.3389/fmars.2020.00131/full>

¹⁴⁷ Klara Björg Jakobsdóttir, Höskuldur Björnsson, Jón Sólmundsson, Kristján Kristinsson, Steinunn Hilma Ólafsdóttir og Valur Bogason. 2020. Protected areas within Iceland's territorial waters and fragile ecosystems. Summary for the Ministry of Industry and Innovation of the available data from areas in the sea around Iceland that have been closed for over 10 years and fishing with demersal gear has been restricted or banned. HV 2021-49 <https://www.hafogvatn.is/static/research/files/hv2020-54.pdf>

3.1	Guiding Principle - 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.
	predators, e.g. cod, haddock, saithe, Greenland halibut, seabirds, and marine mammals ¹⁴⁸ . The Capelin stock appears to be quite abundant as per the 2022 stock assessment. Capelin catches, biomass and juvenile abundance (index) are shown in Figure 41.
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard, but we note the non-conformance highlighted above.

7.6.10 Clause 3.2 Specific Criteria

3.2	Specific Criteria including:
	<ul style="list-style-type: none"> 3.2.1 Information gathering and advice 3.2.2 By-catch and discards 3.2.3 Habitat Considerations 3.2.4 Foodweb Considerations 3.2.5 Precautionary Considerations
Summary of relevant changes:	<p>Context and updates</p> <p>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(i.e. 2022), which include results of routine monitoring and assessment efforts is available online at https://www.hafogvatn.is/en/harvesting-advice. The Directorate of Fisheries monitors catches of a larger suite of species (many of them non-target species) including starry ray/thorny skate, common skate, dogfish, Greenland shark, Porbeagle shark, Atlantic halibut, orange roughy, shagreen ray, etc... Catch records for over 50 species can be retrieved on their website.¹⁴⁹</p> <p>There have been no changes in the gear used in Icelandic waters. Fiskistofa and the Client group confirmed that longliners use night settings and lasers of sounds cannons to keep birds off the longlines, while trawlers use semi-pelagic trawl doors and rock hoppers to decrease drag on the seabed to save fuel and decrease gear habitat contact. Gillnetters are mainly restricted through area closures.</p> <p>The status of bycatch and associated species has been detailed in the previous clause. Spotted wolffish is depleted and subject to corrective actions to reverse the trend. Vulnerable species effects are considered generally limited and not significantly affecting any of the species listed by OSPAR, or the marine mammals and seabirds regularly caught in the gillnet fisheries (mostly in lumpfish).</p>

¹⁴⁸ ICES. 2022. Icelandic ecoregion fisheries overview for 2022. https://ices-library.figshare.com/articles/report/Icelandic_Waters_ecoregion_Fisheries_overview/21487635?file=38378822

¹⁴⁹ <http://www.fiskistofa.is/veidar/aflastada/aflastodulisti/>

<p>3.2 Specific Criteria including:</p> <p>3.2.1 Information gathering and advice</p> <p>3.2.2 By-catch and discards</p> <p>3.2.3 Habitat Considerations</p> <p>3.2.4 Foodweb Considerations</p> <p>3.2.5 Precautionary Considerations</p>	
	<p>According to section 2 of Act no. 57/1996, concerning the treatment of commercial marine stocks, discard of catches (although with minor exceptions) is prohibited, hence the very vast majority if not all catches are landed. Actual discards are illegal and considered relatively small in Icelandic waters. Discarding violations are subject to penalty ranging from ISK 400K to 8M. One feature of this ban is that it has some inbuilt flexibility, as 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 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.</p> <p>Key habitat considerations are listed in the yearly ICES ecosystem report for the Icelandic waters, the last of which was published in 2022¹⁵⁰. Key findings summarised in the report highlight that using vessel monitoring system (VMS) and logbook data ICES estimates that mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category have been deployed over approximately 132,485 km² of the Icelandic ecoregion in 2018, corresponding to ca. 17.5 % of the ecoregion’s spatial extent. Extensive spatial closures are also shown in the region.</p> <p>Foodweb considerations for cod largely depend on its relationship to its mains prey species, capelin, which has been shown to be relatively healthy in 2022 as per MFRI stock assessment and advice (see in Figure 41).</p> <p>Precautionary considerations are integrated in the management of associated and non- target species.</p>
References:	Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document.
Statement of continuing consistency to the IRF Fishery Standard	The fishery continues to remain consistent with the standard.

¹⁵⁰ ICES. 2022. Icelandic Waters ecoregion –Ecosystem overview. In Report of the ICES Advisory Committee, 2022. ICES Advice 2022, Section 11.1, <https://doi.org/10.17895/ices.advice.21731663>

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

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

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

One minor non-conformance was identified (during the 4th surveillance in 2018/19, first certification cycle) 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, while a second minor non-conformance was identified during the 2019-2020 Re-Assessment against clause 3.1.1 relative to the bycatch of spotted wolffish and common loon. Progress against these two NCs for this 3rd Surveillance is specified below, but has been found to be behind target. No new non-conformances were identified during this 3rd Surveillance.

8.1.1 Closed non-conformances

Not applicable, the two active minor non-conformances are still open.

8.1.2 Progress against open non-conformances

Non-conformance 1 (of 1)	
Clause:	2.3.2.4. Catch amounts by species and fishing area shall be estimated and continually recorded in fishing logbooks on-board the fishing vessels
Non-conformance level:	Minor Non-conformance
Non-conformance:	Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks.
Rationale:	The recording of marine mammals and seabirds by number and species is required by Icelandic regulation ¹⁵¹ . Despite the implementation of new mandatory logbook reporting procedures for seabird and marine mammal bycatch, available evidence suggests that far fewer incidences of seabird and marine mammal bycatch are reported via the electronic logbook system than would be expected given the levels reported by onboard observers. This suggests significant levels of under-reporting and/or non-reporting of seabird and marine mammal bycatch. Examples of available evidence to support this conclusion include the findings of Pallson <i>et al.</i> 2015 ¹⁵² and the March 2018 MFRI report titled: “Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017”.

¹⁵¹ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967>

¹⁵² <https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf>

	<p>Pallson <i>et al.</i> 2015 highlighted the fact that their bycatch estimates were based on limited data that needed to be increased and improved with a functioning reporting system for the fishery and better follow up.</p> <p>The MFRI 2018 report found that although reported bycatch in E-logbooks by the fleet has increased (suggesting better compliance with reporting requirements) the overall bycatch rates are still much lower than observed in the trips by inspectors. Overall, the marine mammal and seabird bycatch rate during inspector trips was around four times higher than reported by the fleet in 2017¹⁵³.</p> <p>Furthermore according to a 2017 presentation to NAMMCO’s Working group on bycatch of marine mammals; <i>“logbooks have unfortunately proven unreliable”</i> and <i>“bycatch of birds and marine mammals is 18x higher when observer is present vs logbook records”</i>.</p> <p>While much of the evidence related to non-compliance with reporting requirements may relate to the lumpsucker fishery, this fishery is still part of the management system under review and in addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better.</p>
<p>Corrective Action Plan</p>	<p>In accordance with rules of the IRF Programme, the Client is required to submit a Corrective Action Plan (CAP) within 28 days.</p> <p>The Client submitted the following CAP in February 2019</p>

¹⁵³ <https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf>



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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 Benediksdóttir

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

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

	<p>Accordingly, the Ministry is now considering further action with a view to determine what arrangements are realistically achievable and by when, potentially resulting in the following corrective action timelines:</p> <p>Year 1: Ongoing work to further refine the actions identified above in terms of specific deliverables with their accompanying timeline; Year 2: Initiate deliverable x, y, z identified in Year 1; Year 3: Fully implement and report on progress; Year 4: Continued implementation and reporting.</p>
Assessment Team CAP response	The Assessment Team has accepted the Corrective Action Plan provided by the Client for the fishery under assessment.
Year 1 progress (Re-assessment 2019-2020)	The Client Group submitted the following corrective action evidence in October 2019



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Reykjavík October 25, 2019
Reference: ANR19020189/15.09.00

Subject: Bycatches of non-commercial species in fisheries

The Ministry of Industries and Innovation, Department of Fisheries and Aquaculture has initiated work aimed at reducing bycatch of seabirds and marine mammals in fishing operations. The workplan includes measures aimed at increasing the reliability of recording of catch of non-commercial species in logbooks by location, gear and species.

Currently, the larger Icelandic vessels have electronic logbooks, but most smaller vessels still have paper logbooks. The Directorate of Fisheries has been working on an electronic „logbook-app“ to take over from the paper logbooks which will greatly facilitate recording of non-commercial bycatch onboard small vessel. The app was planned to be ready for use in 2019, but is now expected to be delayed until 2020. A trial version of the app has been initiated.

A task-force has been set up in the Department of Fisheries and Aquaculture to work especially with gillnet fisheries aimed at improving data collection and reviewing possible management measures to minimize bycatch of seabirds and marine mammals. The task-force will be working closely with stakeholders, The Directorate of Fisheries and The Marine and Freshwater Research Institute.

A general information campaign aimed towards all the Icelandic fleet to encourage more accurate recording of non-commercial bycatch will be run in 2020.

On behalf of the Minister of Industry and Commerce

Jóhann Guðmundsson
Director General, Department of Fisheries and Aquaculture

Following the letter supplied by the Ministry on October 25th 2019 to update on progress towards closure of Minor Non Conformance #1, the Client Group spoke in a conference call with the audit team lead and clarified the following information:

The Task Force group has just been set up and it is different and independent from the Committee for Consultation on Responsible Management of Living Marine Resources, reformed in its most current form (and remit) in Nov. 2018. The head of the Task Force is a high-level official in Iceland, the former Permanent Secretary for Fisheries.

The appointed Chair of the Committee for Consultation on Responsible Management of Living Marine Resources brings industry and management stakeholders together to gather information, explore options and seek consensus on what can be done and agreed in a practical sense, thus

	<p>assisting in the official decision-making process. The Task Force is set to continue to collaborate directly with various stakeholders and to explore multiple options and solutions.</p> <p>The Chairs of the Committee and the newly formed Task Force have been in contact to report on recent issues, developments and general updates and to discuss future options. The Client Group communicated that there is a proposed regulation on the table aiming to prohibit all deliberate killing of seals in Iceland (with only minor exception subject to strict conditions and requiring permit from the Directorate of Fisheries) which, if adopted, would contribute to a reduction in overall mortality and assist seal populations growth.</p> <p>Furthermore, an important first step has been recognised as the need to improve social recognition and acceptance of the issues across the gillnet fisheries (for lumpfish and cod), currently considered at high risk.</p> <p>The Client Group further communicated, on behalf of the head of the Task Force, that the small vessels bycatch recording App should be ready for the end of the year, prior to trial by a select group of fishermen. However, the full recording of seabird and marine mammal bycatch in the App may extend beyond the next (2020) fishing season. Meetings have been scheduled in late 2019 to further discuss the App with the Directorate.</p> <p>Another action that is under consideration is the use of picture cards for gillnet fishermen to enable better identification of seals and seabirds and to investigate if additional forms to record bycatch are required in the small fleet.</p> <p>The Task Force is also planning to conduct meetings with small boat owners to reiterate the need to improve data collection. The Directorate is also considering to hold educational meetings around Iceland prior to the start of the next season to increase awareness of the issue and the need for improved catch recording.</p>
<p>Assessment Team Determination on Year-1 Corrective Evidence</p>	<p>The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 1. The non-conformance remains open and on track towards appropriate closure.</p> <p>The first surveillance activities will review evidence that the corrective actions highlighted above have been carried out.</p>
<p>Year 2 progress (1st Surveillance, early 2021)</p>	<p>During the early 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 298/2020¹⁵⁴. The App also called Afladagbókina or catch diary¹⁵⁵ ¹⁵⁶automatically records the location of the boat during fishing and the captains then</p>

¹⁵⁴ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹⁵⁵ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

¹⁵⁶ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

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.

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
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	
	<p>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.</p>						
Assessment Team Determination on Year-2 Corrective Evidence	<p>The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 2. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 2nd surveillance activities will review evidence that the corrective actions highlighted above have been carried out.</p>						
Year 3 progress (2nd Surveillance, late 2021)	<p>As of November 2021, the App continues to be used in the small vessel sector and catch and bycatch data is being collected by Fiskistofa and the MFRI for management purposes. MFRI staff reported that data from the App is in the process of being made available to the MFRI through MFRI/Fiskistofa IT staff collaboration, although timelines for completion are unclear as of November 2021. Fiskistofa has also reported as part of this 2nd surveillance audit that since the beginning of the App's implementation it has been mandatory to register all catch and bycatch according to regulation 298/2020 and the data is being received by the authorities. Their inspectors have been busy training fishermen and captains at the quaysides during landing, and their helpline was quite busy in the beginning of the coastal fleet season. Also, one physical meeting was held in Akranes with coastal fishermen.</p>						

	<p>A tutorial video on the use of the App was also published on the Fiskistofa website https://www.fiskistofa.is/ymsaruppl/tilkynningar/afladagbocarapp-myndband and on the Fiskistofa Facebook site¹⁵⁷.</p> <p>Furthermore, a traceability component to the App has been implemented in April 2021 which is been used to further help with the detection of discrepancies in catch records and to allow better traceability across the supply chain. This traceability component is currently subject to further development.</p>
<p>Assessment Team Determination on Year-3 Corrective Evidence</p>	<p>The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 3. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 3rd surveillance activities will review evidence of continuous implementation of the App in the small vessel sector.</p>
<p>Year 4 progress (3rd Surveillance, late 2022)</p>	<p>2022 Updates. The App is no longer operated/managed by Fiskistofa. The companies Aflarinn, Trackwell and Fontos are now operating the small vessels App. Fiskistofa noted during the October 2022 on site meeting that this data is being sent to the MFRI. However, the MFRI stated that although work is ongoing to getting access to that data stream, staff in charge of bycatch analysis (e.g. Dr Guðjón Már Sigurðsson) do not yet have access to the data from the App. All in all, since implementation of the App it is not clear if bycatch information a) is being collected in the fleet and b) received by the relevant science authorities in charge of data analysis.</p>
<p>Assessment Team Determination on Year-4 Corrective Evidence</p>	<p>Status in late 2022. Progress is deemed to be behind schedule and a revised corrective action has been requested from the Client.</p>

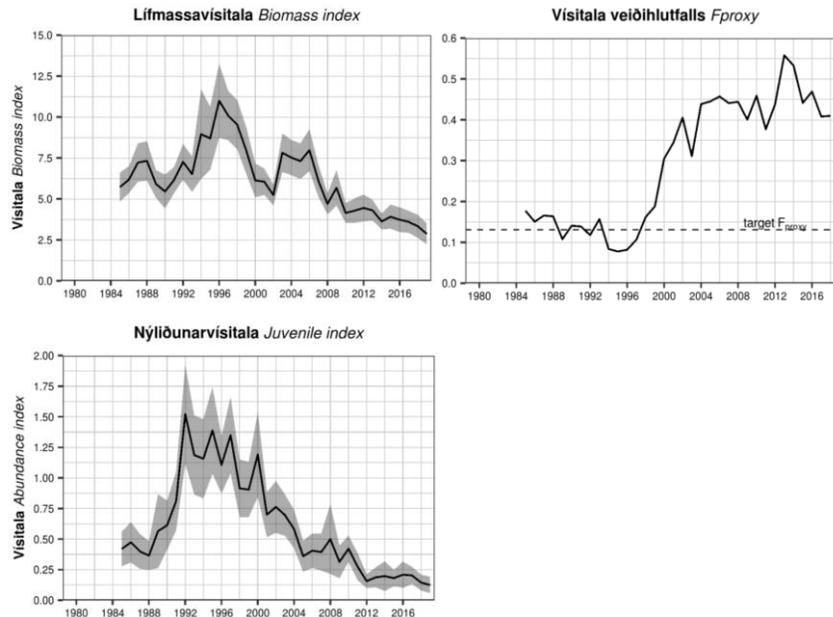
Non-conformance 2 (of 2)	
<p>Clause:</p>	<p>3.1.1. Adverse impacts of the fishery on the ecosystem shall be considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</p>
<p>Non-conformance level:</p>	<p><i>Minor Non-conformance</i></p>
<p>Non-conformance:</p>	<p>There is insufficient evidence that adverse impacts of the cod fishery on the following ecosystem components:</p> <ol style="list-style-type: none"> 1) Spotted wolffish, and; 2) Common loon

¹⁵⁷ <https://www.facebook.com/Fiskistofa-1151844504903713/videos/304666984614930/>

	are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.																																													
Spotted wolffish Rationale:	<p>Around 98% of spotted wolffish (<i>Anarhichas minor</i>) is currently caught as bycatch in the trawl and longline fisheries that target cod and is mainly found in the northwest and north parts of the continental shelf of Iceland, on sandy or muddy substrate and depths of 100-400 meters, in fishing ground overlapping with those of cod. From 2002, the catch on longline has been increasing relative to that taken in demersal trawl. In 2018, longline catch was around 53% of the total catch.</p> <p>Since 2012 catches have been consistently above advice/recommended TAC. Spotted wolffish was included in the ITQ system in 2018 and the TAC in 2018/2019 was set as per recommended TAC of 1001 t^[2]. Issues surrounding this stock were flagged as a potential issue during the IRF cod 4th surveillance assessment in 2018, preceding the current re-assessment.</p> <p>Preliminary catches in 2018/19 have exceeded the TAC based on Fiskistofa records^[3].</p> <table border="1" data-bbox="344 730 1256 1192"> <thead> <tr> <th>Year</th> <th>Advice/ Recommended TAC</th> <th>National TAC</th> <th>Spotted Wolffish Catches</th> <th>Total catches as a % of advice</th> </tr> </thead> <tbody> <tr> <td>12/13</td> <td>900</td> <td></td> <td>2,042</td> <td>227%</td> </tr> <tr> <td>13/14</td> <td>900</td> <td></td> <td>2,250</td> <td>250%</td> </tr> <tr> <td>14/15</td> <td>900</td> <td></td> <td>1,655</td> <td>184%</td> </tr> <tr> <td>15/16</td> <td>900</td> <td></td> <td>1,913</td> <td>213%</td> </tr> <tr> <td>16/17</td> <td>1128</td> <td></td> <td>1,587</td> <td>141%</td> </tr> <tr> <td>17/18</td> <td>1080</td> <td></td> <td>1,528</td> <td>141%</td> </tr> <tr> <td>18/19</td> <td>1001</td> <td>1,001</td> <td>1,234</td> <td>123%</td> </tr> <tr> <td>19/20</td> <td>375</td> <td>375</td> <td></td> <td></td> </tr> </tbody> </table> <p>In a request for clarification, the Ministry confirmed that spotted wolffish is caught with other species in the mixed fishery and is therefore very difficult to manage. They also explained that in the fishing year (2019/2020) the TAC is extremely small so there might be additional difficulties in maintaining the species within TAC.</p> <p>In their 2019 Advice, MFRI advised that when the precautionary approach is applied, catches in the fishing year 2019/2020 should be no more than 375 tonnes. As shown below, biomass and juvenile indices are at their lowest levels in the time series. Fproxy has been high since 2000.</p>	Year	Advice/ Recommended TAC	National TAC	Spotted Wolffish Catches	Total catches as a % of advice	12/13	900		2,042	227%	13/14	900		2,250	250%	14/15	900		1,655	184%	15/16	900		1,913	213%	16/17	1128		1,587	141%	17/18	1080		1,528	141%	18/19	1001	1,001	1,234	123%	19/20	375	375		
Year	Advice/ Recommended TAC	National TAC	Spotted Wolffish Catches	Total catches as a % of advice																																										
12/13	900		2,042	227%																																										
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^[2] [https://www.hafogvatn.is/static/extras/images/13-SpottedWolffish%20\(1\)1141515.pdf](https://www.hafogvatn.is/static/extras/images/13-SpottedWolffish%20(1)1141515.pdf)

^[3] <http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/>



This year the basis of the Fproxý was changed due to low spawning stock biomass and poor recruitment and thus the Fproxý applied last year is no longer considered precautionary. The target Fproxý is now defined as the mean Fproxý from the reference period of 1985–1998. This period was chosen as fishing pressure did not have any observed detrimental effects on the stock biomass. The catch advice is based on multiplying the most recent index value with the target Fproxý value. As this is the first year this basis is used, the uncertainty cap was not applied.

Spotted Wolffish in Europe is categorised as near threatened under the IUCN Red list based on a last assessment from 2014^[4].

It is not clear to what degree management has been successful at reducing harvest for this stock since catches in 2018/19 appear to have exceeded the TAC by over 20%. The same or perhaps a bigger issue remains for the reduced 2019/2020 quota and the related effects on the stock. The cod fishery overlaps in terms of fishing gears, fishing grounds and depths with spotted wolffish catch and is therefore considered to have an effect on this stock, itself a component of the Iceland marine ecosystem.

Common loon Rationale:

The common loon or great northern diver (*Gavia immer*) is listed under Appendix II of the Convention on Migratory Species and under the African Eurasian Waterbird Agreement. It is listed in Article I under the EU Birds Directive. In Europe, it occurs in 20 Important Bird and Biodiversity Areas (IBAs), including in Iceland, Norway (Svalbard and mainland Norway), Ireland, the United Kingdom and in Spain. It is a listed species in 83 Special Protection Areas in the EU Natura 2000 network. Last assessed in 2018, this species is categorised as Least Concern in the IUCN Red List with a stable 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).¹⁵⁸

^[4] <https://www.iucnredlist.org/species/18263655/44739959>

¹⁵⁸ <https://www.iucnredlist.org/species/22697842/132607418#conservation-actions>

The *Gavia immer* population in Iceland is roughly estimated at 200–300 pairs. Known breeding territories are c. 500, with 56% within IBAs, ten of which are specifically designated for this species. Furthermore, one staging area is a designated IBA, holding 10% and sometimes 30% of the population.

Icelandic Red list 2018 Classification¹⁵⁹: Vulnerable (VU, D1), downlisted from EN in 2000.

The annual removal by the cod fishery is estimated at 16.4% (Table below).

Icelandic cod fishery (gillnet, longline, otter trawl) annual seabird estimated bycatch from 2014-2016, including estimates of annual removal. Source: MFRI.

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 (<i>Fulmarus glacialis</i>)	1702 (1362-2042)	920 (340-1500)	0	Endangered	1.2 million pairs	0.11%
Common guillemot (<i>Uria aalge</i>)	454 (340-568)	0	0	Vulnerable	693,000 pairs	0.03%
Northern gannet (<i>Morus bassanus</i>)	128 (69-187)	0	45 (2-90)	Vulnerable	37,000 pairs	0.23%
Atlantic puffin (<i>Fratercula arctica</i>)	13 (1-26)	0	0	Critically Endangered	2 million pairs	0.00%
Razorbill (<i>Alca torda</i>)	26 (2-52)	0	0	Near threatened	313,000 pairs	0.00%
Common loon (<i>Gavia immer</i>)	82 (3-164)	0	0	Vulnerable	200–300 pairs	16.40%
Common eider (<i>Somateria mollissima</i>)	142 (2-282)	0	0	Vulnerable	850,000 birds	0.02%
Cormorants (<i>Phalacrocorax carbo</i>)	0	47 (16-78)	0	Least Concern	4,581 pairs	0.51%
Great-black backed gull	0	67 (2-134)	0	Endangered	6,000–8,000 pairs	0.48%

¹⁵⁹ <https://en.ni.is/node/27141>

	<p>(<i>Larus marinus</i>)</p>
<p>Corrective Action Plan</p>	<p>*Note, the potential decline trajectory of these populations resulting from their INH Red List classification has not been taken into account in the annual percentage removal calculation.</p> <p>The MFRI provided further clarification on common loon bycatch where they highlighted that the estimate has a large variance based on an actual catch of 3 birds over several years. The birds are only vulnerable to bycatch for part of the year before they move to freshwater for nesting, hence the potential for an overestimate. They also noted that these 3 birds were all caught in the same year, and that is only 3 birds caught since 2010 when proper reporting started in the MFRI survey. They continued with saying that the estimate would be much lower if they include data from 2017-2019, but that analysis has not been finalized yet (Guðjón Már Sigurðsson, MFRI, pers. comm, 17th September 2019).</p> <p>In view of the lack of reliable data to establish more precise bycatch estimates across the fishery (due to logbook underreporting of seabird and marine mammal bycatch and limited Directorate’s Inspectors coverage on fishing vessels), the Team treats the estimates provided by the MFRI in September 2019 as best available information, in the absence of better-quality data to counter it. Considering the above, the Assessment Team determines that the cod fishery is likely having an impact on the Icelandic <i>Gavia immer</i> population, partly due to the small population size of this species.</p> <p>In accordance with rules of the IRF Programme, the Client is required to submit a Corrective Action Plan (CAP) within 28 days.</p> <p>Corrective Action Plan (CAP) submitted by the client in November 2019</p> <p>Action to improve management of the spotted wolffish was taken by setting a TAC and allotting individual quotas to vessels beginning in the fishing year 2018-2019. Normally, such change in management approach is expected to lead to adjustment and changes in vessel behaviour, thus in turn leading to catch avoidance and consequent catch reduction. This process may take some time to stabilise and for that reason it is too early to tell to what extent this change serves to remedy the situation. Nevertheless, the TAC for 2019-2020 is only 37.5% of the previous year’s TAC and thus the situations deserves more focused study. It is thus positive to seek other management tools and measures that may further aid in this endeavour. Accordingly, the MFRI has set up a monitoring plan (below). Among other things, this plan sets the goal of further charting the situation in order to identify more closely areas for potential closure during spawning time and beyond. It would thus be appropriate to collate the results and initiate further planning in connection with the next surveillance assessment.</p>

To whom it may concern



Reykjavík, 20.11.2019
21.09.01 /HLÝ
GÐ/mp

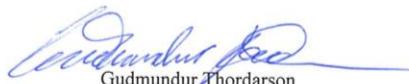
Monitoring plan for spotted wolffish (*Anarhichas minor*)

The aim of the plan is to monitor spatial and temporal changes in catches of spotted wolffish. Reporting of following variables will be done each month.

- § Total catch.
- § Catch by fishing gear.
- § Identifying the vessels that are taking most of the catch.
- § Temporal and spatial changes in the catch.

A research team of 6 scientist from the Marine and Freshwater Research Institute (MFRI) and one from *Fisheries Iceland has been established* . The first meeting of this group will be on the 28th November where the following issues will be discussed.

- § To put more manpower to age read otoliths of spotted wolffish, in order to improve the stock assessment.
- § Examination of reported catch of spotted wolffish from logbooks at spawning time, to locate possible spawning areas. Possible benefits of ongoing research on migration of spotted wolffish, where 15 fishes out of 44 tagged with Digital Storage Tags (DSTs) have been recaptured to locate spawning areas of spotted wolffish. If such areas are found the group will decide on further research steps in order to identify more closely areas for potential closure during spawning and incubation time of spotted wolffish.
- § Ongoing research on fecundity of spotted wolffish will be discussed. One of the aims of this research is to examine if fecundity of spotted wolffish can be estimated with biological variables which are easy to measure and if so used to estimate total egg production (TEP) which can be used to examine the relationship between TEP and recruitment.
- § Future research which will benefit the conservation of spotted wolffish.



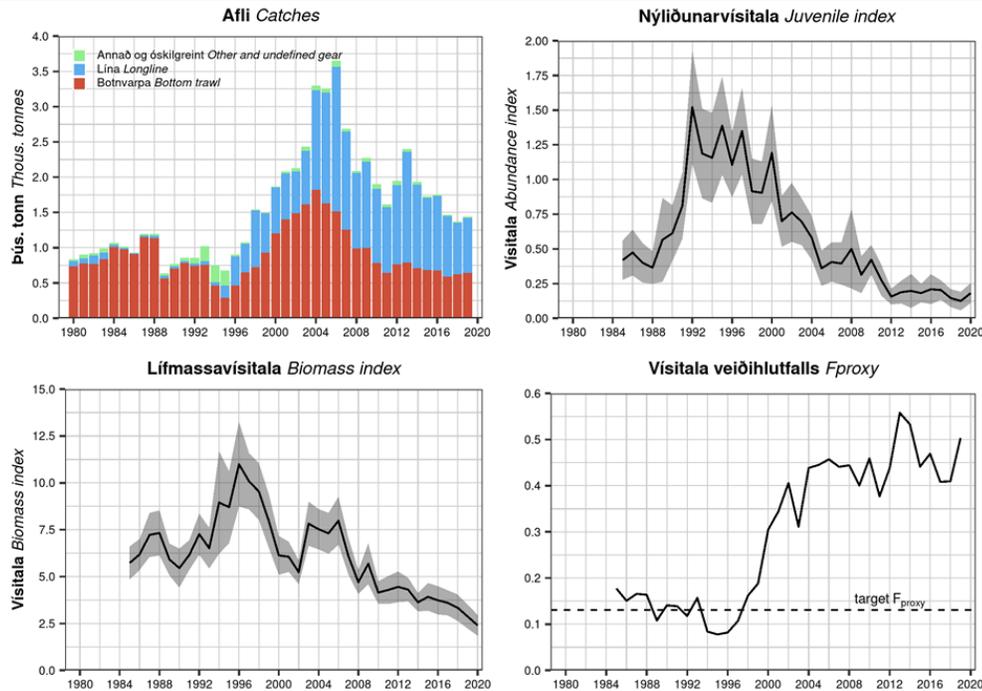
Gudmundur Thordarson
Head of Demersal Division

Hafrannsóknastofnun | Kt. 470616-0830 | Skúlagötu 4 | 101 Reykjavík
Sími: 575 2000 | Fax: 575 2001 | hafogvatn@hafogvatn.is

The Client re-highlighted the MFRI clarification on common loon bycatch whereby they stated that the estimate has a large variance based on an actual catch of 3 birds over several years. The birds are only vulnerable to bycatch for part of the year before they move to freshwater for nesting, hence the potential for an overestimate. They also noted that these 3 birds were all caught in the same year, and that is only 3 birds caught since 2010 when proper reporting started in the MFRI

	<p>survey. They continued with saying that the estimate would be much lower if they include data from 2017-2019, but that analysis has not been finalized yet (Guðjón Már Sigurðsson, MFRI, pers. comm, 17th September 2019).“</p> <p>Hence, at this point, it is difficult to see what specific management action could be taken at this time. The Client awaits the outcome of the analysis discussed by the MFRI (above) in 2020 and notes that there is ongoing action to improve the recording of bycatch in the fishery. Furthermore, the client plans to monitor whether there are instances of common loon bycatch, in order to assess and evaluate and reconsider accordingly, in cooperation with the relevant expert at the MFRI.</p>																																								
<p>Assessment Team CAP response</p>	<p>The Assessment Team has accepted the CAP submitted by the Client Group in collaboration with the MFRI. The CAP is thus considered adequate to address the spotted wolffish and common loon issue. Monitoring of such CAP and related measures will occur in upcoming surveillance audits. Accordingly, the Assessment Team will be requesting the Client group for updated information about this issue at the 1st Surveillance audit in late 2020/early 2021 and will try to establish a more specific set of milestones for future surveillances at that time, to better define the timelines for closure of this minor non-conformance.</p>																																								
<p>Year 1 progress (1st Surveillance, early 2021)</p>	<p>HLÝRI – Spotted wolffish (<i>Anarhichas minor</i>)¹⁶⁰</p> <p>Because the stock is depleted and Icelandic catches were consistently above recommended TAC and above TAC in the two most recent fishing seasons (see next table), a minor non-conformance was raised in 2019.</p> <p><i>Spotted wolffish. Recommended TAC, national TAC, and catches (tonnes).</i></p> <table border="1" data-bbox="349 1024 1000 1325"> <thead> <tr> <th>Fiskveiðiár Fishing year</th> <th>Tillaga Rec. TAC</th> <th>Aflamark National TAC</th> <th>Afli Catches</th> </tr> </thead> <tbody> <tr> <td>2012/13</td> <td>900</td> <td>-</td> <td>2042</td> </tr> <tr> <td>2013/14</td> <td>900</td> <td>-</td> <td>2250</td> </tr> <tr> <td>2014/15</td> <td>900</td> <td>-</td> <td>1655</td> </tr> <tr> <td>2015/16</td> <td>900</td> <td>-</td> <td>1913</td> </tr> <tr> <td>2016/17</td> <td>1128</td> <td>-</td> <td>1587</td> </tr> <tr> <td>2017/18</td> <td>1080</td> <td>-</td> <td>1528</td> </tr> <tr> <td>2018/19</td> <td>1001</td> <td>1001</td> <td>1383</td> </tr> <tr> <td>2019/20</td> <td>375</td> <td>375</td> <td></td> </tr> <tr> <td>2020/21</td> <td>314</td> <td></td> <td></td> </tr> </tbody> </table> <p>Updates and corrective actions follow. As spotted wolffish are mainly caught as bycatch, catches have been above recommendations, and biomass indices are now at historically low levels, MFRI recommends in their 2020 advice that fishermen will be allowed to release spotted wolffish caught beyond set TAC. The biomass index has decreased since 2008 and continuously from 2015. SSB is likely to be below any candidate value of Blim. The juvenile index indicates a recruitment failure since 2012. Fproxy has been above target in recent years.</p>	Fiskveiðiár Fishing year	Tillaga Rec. TAC	Aflamark National TAC	Afli Catches	2012/13	900	-	2042	2013/14	900	-	2250	2014/15	900	-	1655	2015/16	900	-	1913	2016/17	1128	-	1587	2017/18	1080	-	1528	2018/19	1001	1001	1383	2019/20	375	375		2020/21	314		
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¹⁶⁰ <https://www.hafogvatn.is/static/extras/images/13-spottedwolffish1206865.pdf>



Spotted wolffish harvest rate and biomass. Source 2020 MFRI Advice.

Additional management measures have been implemented for this stock in 2020. During the remote site visit the MFRI communicated that there is a strong need to protect the stock. Studies in Canada show that wolffish is generally fairly robust and can survive capture by trawls. For example, Grant and Hiscock (2014)¹⁶¹ showed a 92-100% post capture survival for spotted wolffish following net entrapment in commercial bottom otter trawl tows up to 2.5 h, haul back through a thermocline (range, 5.8 °C), and exposure to 5–13 °C air temperatures for up to 2 h. As a result of this, the MFRI gave a landings advice for the 2020/21 season and suggested that fishers would be allowed to discard spotted wolffish as per Regulation 1256/2020¹⁶² which now allows fishers to discard viable (living) spotted wolffish, as opposed to landing it dead, taking advantage of the high post capture survival of this fish. As per article 1 of this regulation, if spotted wolffish is released, the type and estimated quantity in kilograms released shall be recorded in an electronic catch logbook or the smart device program. Hence the amount caught and landed and the amount caught and released will be recorded. In addition, the MFRI is in the process of measuring the survival of spotted wolffish in Icelandic waters and, in addition to age reading, they hope to potentially develop a recovery plan for the stock.

¹⁶¹ Grant, S.M., and Hiscock, W. 2014. Post-capture survival of Atlantic Wolffish (*Anarhichas lupus*) captured by bottom otter trawl: Can live release programs contribute to the recovery of species at risk? *Fish. Res.* 151: 169-176. <https://www.sciencedirect.com/science/article/abs/pii/S0165783613002816>

¹⁶² Reglugerð um (2.) breytingu á reglugerð nr. 468/2013, um nýtingu afla og aukaafurða. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunnarraduneyti/nr/22242>

Seabirds bycatch

For seabirds, the highest estimated bycatch numbers between 2016 and 2019 are those of common guillemot (gillnet), Northern fulmar, longline and gillnet), lesser black backed gull and northern gannet (both caught with gillnets). This data has been provided by the MFRI in January 2021.

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 as a percentage of estimated population
Northern fulmar (<i>Fulmarus glacialis</i>)	118	3716	0	Endangered	1.2 million pairs	0.14%
Common guillemot (<i>Uria aalge</i>)	434	0	0	Vulnerable	693,000 pairs	0.03%
Northern gannet (<i>Morus bassanus</i>)	0	467	21	Vulnerable	37,000 pairs	0.66%
Brünnich's guillemot (<i>Uria lomvia</i>)	19	0	0	Endangered	327,000 pairs	0.003%
Herring gull (<i>Larus argentatus</i>)	0	111	0	Near Threatened	5,000–10,000 pairs	0.74%
Lesser black-backed gull (<i>Larus fuscus</i>)	0	779	0	Data Missing	42,000 pairs	0.93%
Common loon (<i>Gavia immer</i>)	25	0	0	Vulnerable	279 pairs ¹⁶³	4.48%
Common eider (<i>Somateria mollissima</i>)	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-

¹⁶³ 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-Sléttu, near Mývatn and in Veiðivötn. Source: <https://www.ni.is/node/27141>

	<p>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).¹⁶⁴</p> <p>Common loon was the subject of a minor non-conformance during the Re-Assessment audit because the 2014-2016 removal estimates were larger than the most up to date ones (2016-2019 dataset). More specifically, the MFRI provided further clarification about the 2014-2016 dataset on common loon bycatch where they highlighted that the estimate had a large variance based on an actual catch of 3 birds over several years. The birds are only vulnerable to bycatch for part of the year before they move to freshwater for nesting, hence the potential for an overestimate. They also noted that these 3 birds were all caught in the same year, and that there were only 3 birds caught since 2010 when proper reporting started in the MFRI survey (these 3 birds were presumably caught once in 2016). They continued with saying that the estimate would be much lower if they include data from 2017-2019, which has been confirmed during this first surveillance audit through provision of more up to date bycatch information. We also note that the assessment from the Iceland Institute of Natural History (INH) Red List Classification states that the population of common loon in Iceland (currently estimated at 279 pairs) is presumed to be 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-Sléttu, near Mývatn and in Veidivötn.</p> <p>Because this population is quite small, even very small removals can have negative effects, especially if those happen year after year. The assessment team considers the new data is a step in the right direction in terms of continuous risk monitoring for this species. Furthermore, because the incidental catch was based on a single event, rather than multiple, there is some basis to hypothesize that gillnet impacts may be only occasional. Monitoring will be continued in the next surveillance audit to check if there are updated information on this species status and/ or data on potential bycatch.</p>
<p>Assessment Team Determination on Year-1 Corrective Evidence</p>	<p>The Assessment Team has determined that the information supplied is sufficient to show adequate progress. In terms of corrective action against timelines, the Assessment Team agreed to continue monitoring the status of this non-conformance until the 4th surveillance using up to date evidence submitted by the Client Group and management authorities, and to ensure the condition is closed within that timeframe. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 2nd surveillance activities will review evidence that the corrective actions highlighted above have been carried out.</p>
<p>Year 2 progress (2nd Surveillance, late 2021)</p>	<p>The MFRI gave a landings advice for the 2020/21 season and suggested that fishers would be allowed to discard spotted wolffish as per Regulation 1256/2020¹⁶⁵ which now allows fishers (starting December 2020) to discard viable (living) spotted wolffish, as opposed to landing it dead, taking advantage of the high post capture survival of this fish. The regulation continues in the</p>

¹⁶⁴ <https://www.iucnredlist.org/species/22697842/132607418#population>

¹⁶⁵ Reglugerð um (2.) breytingu á reglugerð nr. 468/2013, um nýtingu afla og aukaafurða.

	<p>2021/2022 fishing season¹⁶⁶. As per article 1 of this regulation, if spotted wolffish is released, the type and estimated quantity in kilograms released shall be recorded in an electronic catch logbook or the smart device program. Hence the amount caught and landed and the amount caught and released will be recorded. The Client and Fiskistofa both communicated that the logbook system is not properly set up with space to recorded landed and released spotted wolffish and for now, captains are recording the released portion in the comment section of the logbook. There is also work in progress by Trackwell to modify the electronic logbooks to allow for separate recording of landed and released catches. In addition, the MFRI is in the process of measuring the survival of spotted wolffish in Icelandic waters and, in addition to age reading, they hope to potentially develop a recovery plan for the stock. It is expected that the allowance to release live individuals (as opposed to having to land them) will contribute to bringing the catches within TAC as a first step towards stock rebuilding.</p> <p>The Icelandic fishing season started on the 1st of September and ends on the 31st of August each year. The current landed catch of spotted wolffish as per 2021-22 season that started is 250 tonnes. It is expected that some percentage of the total spotted wolffish caught will be released alive and recorded as such in this season, to avoid landed harvest above the current 2011/22 TAC of 377 tonnes. The 2021/22 season will be the first full fishing season where the full effect of this regulation will be recorded.</p> <p>No additional data on common loon bycatch has been made available due to limited inspector coverage on board of fishing vessels during the Covid-19 pandemic. To date, the occurrence of bycatch appears to have taken place in 2016 only.</p>
<p>Assessment Team Determination on Year-2 Corrective Evidence</p>	<p>The Assessment Team has determined that the information supplied is sufficient to show progress for year 2. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 3rd surveillance activities will review evidence of implementation of the new spotted wolffish live-release regulations, and evidence of potential bycatch of common loon.</p>
<p>Year 3 progress (3rd Surveillance, late 2022)</p>	<p>Spotted wolffish</p> <p>Currently, an entry to submit released spotted wolffish in the logbooks is lacking. There is only an entry which is used for landed wolffish, which makes the process of understanding if this species is released alive after the TAC has been met, nearly impossible. This is an issue which hinders verification of implementation for Regulation 1256/2020¹⁶⁷ (starting December 2020) allowing discard viable (living) spotted wolffish, as opposed to landing it dead, taking advantage of the high post capture survival of this fish. The figure reported on the Fiskistofa website are landed values excluding releases, as it has proven difficult to record the released numbers. The total landed catch for the 2021/22 season logged on the Fiskistofa website as of December 2022 was 931 t., close to three times the allowed TAC¹⁶⁸. The 2021/22 season was the first full fishing season where the full</p>

¹⁶⁶ <https://www.hafogvatn.is/static/extras/images/16-spottedwolffish1259438.pdf>

¹⁶⁷ Reglugerð um (2.) breytingu á reglugerð nr. 468/2013, um nýtingu afla og aukaafurða.

¹⁶⁸ <https://gamli.fiskistofa.is/veidar/aflaupplýsingar/afliallartegundir/>

	<p>effect of this regulation was recorded. According to the above, it is not clear if this new regulation is being observed in the fleet. The MFRI also noted that it has been working on building an assessment model for spotted wolffish that could be used as the basis of advice in the coming years.</p> <p>Common loon</p> <p>In December 2022, the MFRI reported that no further common loons (<i>Gavia immer</i>) have been recorded as bycatch in the fisheries under assessment (i.e. cod, haddock, Golden redfish, ling, common ling, tusk, ISS herring). The last 3 birds were encountered in 2016. In the 1st surveillance, the audit team determined that because the incidental catch was based on a single event, rather than multiple, there is some basis to hypothesize that gillnet impacts may be only occasional. Furthermore, the assessment from the Iceland Institute of Natural History (INH) Red List Classification states that the population of common loon in Iceland (currently estimated at 279 pairs) is presumed to be 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-Sléttu, near Mývatn and in Veiðivötn. At this stage, significant risk from fishing appears to be relatively limited due to the lack of positive records but monitoring will continue at the next surveillance audit to check if there is updated information on this species status and/or data on potential bycatch (e.g. bycatch data from the fleet logbooks). The WGBYC 2021 report¹⁶⁹ mentions one catch of <i>Gavia immer</i> (part of Non-Conformance #2) in 2019 and one in 2020, respectively, by lumpfish nets by onboard observers. Three individuals were recorded as bycatch in the Iceland Sea in 2021, apparently all caught in lumpfish nets (ICES WGBYC 2022¹⁷⁰). The lack of information from the fleet may be an issue in recognising the real impact to this species. As such current progress (see NC#1) is considered to be behind target.</p>
<p>Assessment Team Determination on Year-3 Corrective Evidence</p>	<p>Spotted Wolffish part Status: Open, Corrective Actions in place to be reviewed annually in subsequent audits. Progress is deemed to be behind schedule and a revised corrective action has been requested from the Client.</p> <p>Common loon part Status: Open, Corrective Actions in place to be reviewed annually in subsequent audits. Progress is deemed to be behind schedule and a revised corrective action has been requested from the Client.</p>

8.1.3 New non-conformances

Not applicable. No new non-conformances have been identified.

¹⁶⁹ ICES (2021): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.9256> https://ices-library.figshare.com/articles/report/Working_Group_on_Bycatch_of_protected_Species/18621773

¹⁷⁰ ICES (2022): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.21602322.v1>

8.1.4 New or revised corrective action plans

As detailed in the section above a revised Corrective Action Plan was requested by the Assessment Team to close the identified issue/s (and resulting non-conformance progress behind target) within a reasonable timeline. The client requested an extension to rectify this based on Covid 19 delays in the past two years, which the IRF Scheme Owner approved. Accordingly, GTC granted until the Client Review stage of the upcoming Re-Assessment period for the Client to close the non-conformance/s at hand. The extension allowed one extra year from the originally planned closure timeline (supposed to be end at the 4th surveillance audit in late 2023, now one year later in late 2024).

Revised corrective action plan (CAP) provided on the 14th February 2023 by the Client Group



Icelandic Commercial Fishery

IRF Client Action Plan

Reference is made to *IRF. Icelandic Cod Commercial Fishery. 2nd Surveillance Assessment Report* by Global Trust, where it is stated that two minor non-conformances are still open.

NC #1: Clause 2.3.2.4 (applies to all 7 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.

ACTION

By the 4th surveillance audit (expected October 2023), the client has:

- a) Produced and distributed material to all members of Fisheries Iceland on the regulation and the obligation of reporting of seabirds and marine mammals bycatch. This will reach skippers using all types of gears.
- b) Follow-up with a meeting especially with skippers using nets and lines.

Part of this is a cooperation with the Directorate of Fisheries which will start work on improving registration in logbooks, see letter from the CEO of the Directorate of Fisheries.

By the final auditable stage (expected October 2024), Marine and Freshwater Research Institute in Iceland will publish a report on bycatch of seabirds and marine mammals, see letter from the CEO of the MFRI.

NC #2: Clause 3.1.1. (applies to cod, haddock and saithe fishery). There is insufficient evidence that adverse impacts of the (cod, haddock and saithe) fisheries on the following ecosystem components: 1)

Spotted wolffish, and; 2) Common loon are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.

1) *Spotted wolffish:*

The client can confirm that Trackwell has updated the electronic logbooks and from now on instead of released spotted wolffish being registered in "comment" in logbooks, which is both unpractical for the skipper to register and makes it difficult for MRI to collect the data on released spotted wolffish from the logbookdatabase, there is now in the new and updated version of the logbook, a form for released species in which the skipper can register species and quantity as he does with catch. This logbook is now being installed in vessels.

ACTION

By the 4th surveillance audit (expected October 2023), the client has:

- a) Follow up the updated logbook by urging vessel owners to install the new and updated version.
- b) Contacted and set up a meeting with the industry to inform on the importance of releasing live spotted wolffish.

2) *Common loon*

By the 4th surveillance audit (expected October 2023), the client has:

- a) Produced and distributed material to all members of Fisheries Iceland on the regulation and the obligation of reporting of seabirds and marine mammals bycatch. This will reach skippers using all types of gears.
- b) Follow-up with a meeting especially with skippers using nets and lines.

Part of this is a cooperation with the Directorate of Fisheries which will start work on improving registration in logbooks, see letter from the CEO of the Directorate of Fisheries.

By the final auditable stage (expected October 2024), Marine and Freshwater Research Institute in Iceland will publish a report on bycatch of seabirds and marine mammals, see letter from the CEO of the MFRI.

Reykjavík, February 16th 2023

On behalf of Fisheries Iceland,



Hrefna Karlsdóttir

Support letters from MFRI and Fiskistofa



**MARINE & FRESHWATER
RESEARCH INSTITUTE**

To whom it may concern

Date: 15.02.2023
Ref:V2023-02-0106

The Directorate of Fisheries in Iceland received a grant from the Ministry of Food, Agriculture and Fisheries in February 2023 to strengthen monitoring of discards in Icelandic Waters and improving reporting in log-books.

The Marine and Freshwater Research Institute (MFRI) in Iceland is depending on reliable log-books and MFRI has had full access to these data for decades, for scientific purposes. MFRI is cooperating with the Directorate in the above mentioned project where the task of the institute is to evaluate if the level of reporting is sufficient for bycatch species, including seabirds and marine mammals.

It is expected that the outcome of the project will be published in October 2024.

On behalf of the Marine and Freshwater Research Institute,


Þorsteinn Sigurðsson
Director

HAFOGVATN
Rannsóknastofnun
Rannsókn- og ráðgjafarstofnun hafs og vatna
MARINE & FRESHWATER RESEARCH INSTITUTE



DIRECTORATE OF FISHERIES

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To whom it may concern

Keeping an electronic catch logbook has been mandatory for all fishing vessels in Iceland since 2020. The Directorate of Fisheries has discovered inaccurate registration in logbooks in some cases, and we aim to improve accuracy of registration in the logbooks. That will be done with improved automatic electronic validation of information on registered catch in the logbooks.

The Directorate of Fisheries received a grant from the Ministry of Food, Agriculture, and Fisheries in February 2023 to strengthen monitoring of discards in Icelandic waters. The focus of that project will be on electronic monitoring and comparison of data. The method used will be comparing data from vessels fishing in the same fishing grounds with and without on-board inspectors to analyse conspicuous differences in registration of catch and bycatch including seabirds and mammals. This methodology, known as case control, consists of a structured comparison of cases where an inspector is present with comparable control cases where inspection did not take place. One aspect of that project is to improve the accuracy of registrations in the catch logbooks that are important for data analysis.

Drones were introduced in the Directorate's surveillance effort in 2021. They have proved to be very effective in identifying discards. The drones are also effective in monitoring discards of birds and mammals and will be used to improve monitoring of the accuracy of catch registration in the logbooks.

Furthermore, the Directorate of Fisheries is now working on streamlining legal procedures regarding violations of logbook registration to better support correct registration. Another part of improving the registration is to put increased emphasis on information sharing and guidance for skippers on the Directorate of Fisheries webpage.



Ögmundur Knútsson PhD
CEO Directorate of Fisheries

Assessment Team determination on the revised CAP

The assessment team has reviewed the provided corrective action plan and support letters from the MFRI and Fiskistofa and is satisfied that implementation of the actions highlighted in those documents would address the non-conforming areas by late 2024, when the non-conformance/s are due to be closed.

8.1.5 Update on Recommendations

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

Recommendation 1 (of 2)	
Clause:	3.1.1
Recommendation:	The Assessment Team recommends that Grey skate (<i>Dipturus</i> spp.), a Critically Endangered Species listed in the IUCN Red list, are afforded more explicit/directed management measures to ensure that the current bycatch levels resulting from longline, bottom trawl and Danish seine fisheries in Icelandic waters do not negatively affect the recovery of this species.
Rationale:	This species is not afforded more explicit/directed management measures.
Progress against Recommendation:	Grey skate (<i>Dipturus flossada / batis</i>) survey abundance is variable but has been on average relatively stable in recent years. The MFRI spring survey caught 56 t in 2019, 43 t in 2020, 32 t in 2021 and 69 t in 2022. Fishery landed catch of Grey skate was 160 t in 2020 and 158 t in 2021. No explicit management measures are planned for the management of this stock/s in Iceland.

Recommendation 2 (of 2)	
Clause:	3.1.1 and 3.1.2
Recommendation:	Several fisheries management plans (e.g. those for cod, haddock, saithe and redfish) state that it is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs). VMEs of particular importance within Iceland include cold water coral communities and hydrothermal vent areas, but also deep-sea sponge aggregations (a threatened and declining habitat, according to OSPAR ¹⁷¹) and sea-pen fields ¹⁷² . Currently, there are explicit conservation measures for cold water corals and hydrothermal vents (i.e. area closures) but nothing explicit for either deep sea sponge aggregations or sea pen fields. The assessment team recommends that more formal conservation plans/measures are formulated for these VMEs.
Rationale:	These VMEs are not formally protected.
Progress against Recommendation:	The Ministry of Industry and Innovation has begun work on formulating a protection policy for vulnerable bottom ecosystems (or vulnerable marine ecosystems) within the Icelandic economic zone to shape procedures for the protection of fragile benthic ecosystems based on international standards criteria that Iceland is signatory to. The closures that MFRI proposed are being processed at present time (October 2022) by the Ministry of Fisheries. The closures include Hydrothermal vents, Sponge Aggregations mixed with Cauliflower coral ground and Sponge Aggregations on underwater mountains.

9 Recommendations for continued certification

9.1 Certification Recommendation

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

¹⁷¹ http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/Ecosystem_overview-Icelandic_Waters_ecoregion.pdf

¹⁷² <https://novasarc.hafogvatn.is/project/>

9.2 Certification Committee Determination

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

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

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11 Appendices

11.1 Appendix 4 – Assessment Team Bios

11.1.1 Assessment Team Bios

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

Vito Romito, Lead Assessor

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

Dankert Skagen, Assessor

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

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