

Iceland Responsible Fisheries Foundation (IRFF)

Iceland Responsible Fisheries Certification Programme



Icelandic Ling 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 owns and operates the brand of Iceland Responsible Fisheries including the certification programme.

1 Contents

| | |
|---|------------|
| Foreword..... | 2 |
| 1 Contents | 3 |
| 1.1 List of Figures | 4 |
| 1.2 List of Tables..... | 5 |
| 2 Executive Summary | 7 |
| 2.1 Assessment Team Details | 7 |
| 2.2 Details of applicable IRF Documents..... | 7 |
| 3 Fishery Applicant Details | 8 |
| 4 Units of Certification..... | 8 |
| 5 Assessment Process | 9 |
| 5.1 Surveillance Meetings | 9 |
| 6 Summary Findings | 16 |
| 6.1 Relevant changes to Legislation/Regulations and the Management Regime | 16 |
| 6.2 Stock status update | 20 |
| 6.3 Landings update | 30 |
| 6.4 Enforcement and Compliance update..... | 33 |
| 6.4.1 Enforcement by Fiskistofa | 37 |
| 6.4.2 Enforcement by the Icelandic Coast Guard | 37 |
| 6.5 Bycatch, habitat and ecosystem update | 41 |
| 6.5.1.1 Habitat..... | 61 |
| 6.5.1.2 Foodweb considerations | 68 |
| 6.6 Update on consistency to the fundamental clauses of the RFM Fishery Standard | 69 |
| Section 1. Fisheries Management | 69 |
| 6.6.1 Clause 1.1 Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls | 69 |
| 6.6.2 Clause 1.2 Research and Assessment | 69 |
| 6.6.3 Clause 1.3 Stock under Consideration, Harvesting Policy and the Precautionary Approach | 71 |
| 6.6.4 Clause 1.4 External Scientific Review | 72 |
| 6.6.5 Clause 1.5 Advice and Decisions on TAC | 72 |
| Section 2. Compliance and Monitoring | 74 |
| 6.6.6 Clause 2.1 Implementation, Compliance, Monitoring, Surveillance and Control | 74 |
| 6.6.7 Clause 2.2 Concordance between actual Catch and allowable Catch | 77 |
| 6.6.8 Clause 2.3 Monitoring and Control..... | 79 |
| Section 3. Ecosystem considerations..... | 84 |
| 6.6.9 Clause 3.1 Guiding Principle | 84 |
| 6.6.10 Clause 3.2 Specific Criteria | 89 |
| 7 Update on compliance and progress with non-conformances and agreed action plans | 92 |
| 7.1.1 New non-conformances | 99 |
| 7.1.2 New or revised corrective action plans | 100 |
| 7.1.3 Update on Recommendations | 104 |
| 8 Recommendations for continued certification | 104 |
| 8.1 Certification Recommendation | 104 |
| 8.2 Certification Committee Determination | 104 |
| 9 References | 105 |
| 11 Appendices | 113 |
| 11.1 Appendix 1 – Assessment Team Bios | 113 |
| 11.1.1 Assessment Team Bios | 113 |

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). | 19 |
| Figure 2. Geographical distribution (tonnes/square mile) of the Icelandic longline ling fishery since 2000 as reported in logbooks by the Icelandic fleet..... | 22 |
| Figure 3. Number of ling length-measured and otoliths aged by gear and year. Data from MFRI assessment report 2022. | 23 |
| Figure 4. Location of samples and distribution of catches of ling..... | 23 |
| Figure 5. Stations in the Spring and Autumn groundfish surveys and the gillnet survey in 2021, which can be regarded as a typical year..... | 24 |
| Figure 6. Area distribution (absolute and relative) of catches of ling in the spring survey. | 25 |
| Figure 7. Analytic retrospective results (results when removing recent data)..... | 26 |
| Figure 8. Historical retrospective results..... | 26 |
| Figure 9. Main results in 2022 assessment. | 27 |
| Figure 10. Ling in Division 5.a. Equilibrium catches (in tonnes, left panel) and corresponding SSB (in tonnes, right panel) as a function of fishing mortality implemented in the HCR. In both panels, the solid curves indicate the median of the distribution and the ribbons the 5th and 95th and 25th and 75th percentiles. The black vertical line corresponds with FMGT (0.30). Red vertical lines correspond with Fp05 (dashed) and Flim (solid). The dashed and solid red horizontal lines are MGT Btrigger (11 100 tonnes) and Blim (9 000 tonnes), respectively. | 29 |
| Figure 11. Catches of ling by area. | 30 |
| Figure 12. History of stock and exploitation according to the assessment in 2021..... | 31 |
| Figure 13. Net transfer of quota to and from ling in the Icelandic ITQ system by fishing year. Between species (upper): Positive values indicate a transfer of other species to ling, but negative values indicate a transfer of ling quota to other species. Between years (lower): Transfer of quota from given quota year to the next quota year. | 32 |
| Figure 13. Overall number of ICG inspection from 2012 to 2022. Source: ICG, November 2022..... | 38 |
| Figure 14. Air Surveillance hours by RPAS (drone) between May 31st until August 31 st 2022..... | 39 |
| 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. | 40 |
| Figure 17. Icelandic cod harvest rate and biomass. | 41 |
| Figure 18. Icelandic haddock harvest rate and biomass. | 42 |
| Figure 19. Icelandic saithe harvest rate and biomass. | 43 |
| Figure 20. Icelandic golden redfish harvest rate and biomass..... | 44 |
| Figure 21. 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..... | 45 |
| Figure 22. Greenland halibut harvest rate and biomass. | 46 |
| Figure 23. Atlantic wolffish harvest rate and biomass. | 47 |
| Figure 24. Greater silver smelt harvest rate and biomass..... | 48 |
| Figure 25. Plaice harvest rate and biomass. | 49 |
| Figure 26. Norway lobster harvest rate and biomass. | 50 |
| Figure 27. Lemon sole harvest rate and biomass..... | 51 |
| Figure 28. Witch harvest rate and biomass..... | 52 |
| Figure 29. Tusk harvest rate and biomass. | 53 |
| Figure 30. Anglerfish harvest rate and biomass. | 54 |

Figure 31. Catches by gear type, IS-SMB juvenile (≤ 20 cm) and biomass (≥ 30 cm) indices. Shaded areas and error bars represent 95% confidence intervals. The red horizontal lines indicate the average biomass indices for 2018–2020 and for 2021–2022 used in the advice calculations. 55

Figure 32. Leaf scale gulper shark caught in the annual autumn survey, from 1996 to 2022. 59

Figure 34. Dogfish caught in the annual spring survey, 1985 to 2022. 60

Figure 35. Greenland shark caught in the annual spring survey. 61

Figure 36. 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... 62

Figure 37. 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. 63

Figure 38. MFRI overview of seabed mapping in Icelandic waters between 2000 and 2022. Source: <https://www.hafogvatn.is/en/research/seabed-mapping>. 64

Figure 39. Benthos recorded in the autumn Icelandic autumn groundfish survey in 2020. Number (kg) per tow. 66

Figure 40. Long term closures and selected fishing distribution around Iceland between 2009-2019. 67

Figure 41. 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> 68

Figure 41. Main results of 2021 assessment, including historic retrospective deviations (From the MFRI advice on ling in 2022). 70

Figure 15. Overview of ICG infringement reports in 2017- (1st September) 2022. Source: provided by the ICG on the 8th of November 2022. 77

Figure 13. Net transfer of quota to and from ling in the Icelandic ITQ system by fishing year. Between species (upper): Positive values indicate a transfer of other species to ling, but negative values indicate a transfer of ling quota to other species. Between years (lower): Transfer of quota from given quota year to the next quota year. 79

1.2 List of Tables

Table 1. Relevant GULF RFM program documents including applicable versions. 7

Table 2. Applicant details. 8

Table 3. Unit of Certification (UoC). 8

Table 4. Summary of assessment meetings that took place on October 11th – 13th 2022 in Iceland. 9

Table 5. Reference points for Ling set in 2022. 28

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

Table 7. Short term closures in Iceland for the years 2018-2022. 36

Table 8. Directorate inspector days on fishing vessels (Source: Fiskistofa, October 2022 on-site audit). 36

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. 37

Table 10. Status of bycatch and associated species in the common ling target and non-target fisheries. 41

Table 11. Precautionary and management reference points. 71

Table 12. Short term closures in Iceland for the years 2018-2022. 74

Table 13. 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. 75

Table 14. Recommended TAC, quotas and reported catches for Icelandic ling. 78

1.3 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 _{Btrigger} | 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 |

2 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-conformance is 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.

2.1 Assessment Team Details

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

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

2.2 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 |

3 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: |
| | City: |
| | Country: |
| | 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: |
| | City: |
| | Country: |
| | Postal Code: |
| Phone: | (354) 552 7922 |
| Web: | www.smabatar.is |
| Contact person: | Örn Pálsson |
| Position: | Managing Director |
| E-mail Address | orn@smabatar.is |

4 Units of Certification

The Unit of Certification (i.e., what is covered by the fishery certificate) is as described in Table 3 below.

| Table 3. Unit of Certification (UoC). | | |
|---------------------------------------|----------------------------|---|
| Species: | Common name (ENG and ISL): | Common ling (Langa) |
| | Latin name: | <i>Molva molva</i> |
| Geographical Area(s) | | Iceland 200-mile EEZ within FAO Fishing Area 27 |
| Stock(s) | | Ling in ICES Division 5.a (Iceland grounds) |
| Management System | | Ministry of Industries and Innovation (Iceland) |
| Fishing gear(s)/method(s) | | Longline; Demersal trawl; Nephrops trawl; Gillnet; Danish seine; Hook-and-line by small vessels; Gears from other Icelandic fisheries legally landing ling* |
| 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.

5 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.

5.1 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? ○ Are there closures to protect herring nowadays? ▪ Tusk: <ul style="list-style-type: none"> ○ The contribution from Subarea XIV. Any new developments or initiatives? |

| | | |
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| | | <ul style="list-style-type: none"> ◦ 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) dogfish/spurdog, 2) Greenland shark 3) porbeagle shark, 4) basking sharks and 5) leafscale gulper sharks? ▪ Can the assessment team be provided with total catch in numbers of Grey skate (<i>Dipturus flossada / batis</i>) for the latest available MFRI survey? Any additional |
|--|--|---|

| | | |
|---|-----------------------------------|--|
| | | <p>updates on the state of this endangered species / complex? Any specific management measures for this species?</p> <ul style="list-style-type: none"> ▪ 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? |
| <p>Date: Wednesday 12th October 2022</p> | <p>Icelandic Coast Guard:</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? |

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>

| | | |
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| <p>Location: Skógarhlíð 14, 105 Reykjavík</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"> ▪ 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: 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 from the nearest observer. Is it still so? How about sampling from catches that are processed on board. ▪ Discards – any monitoring activities by Fiskistofa? |

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| | | <ul style="list-style-type: none"> ▪ 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? <ol 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: There is insufficient evidence that adverse impacts of the cod, haddock and saithe fisheries on the following ecosystem components:</u> <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? ▪ 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 |
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| | | <p>2021 report, especially the Afladagbók, Vanskil afladagbókar and the Mál vegna umframafla entries?</p> <ul style="list-style-type: none"> ▪ 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 Þórarinnsson, 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 small vessel sector about implementation? Is it helping collect bycatch information? |

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| | | <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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6 Summary Findings

6.1 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 ling⁴. 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 Food, Agriculture and Fisheries⁷. The Ministry 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 the catches and the quality of the vessels. It performs sea and air patrols and monitoring of fishing within the Icelandic zone. It also operates the Icelandic Maritime Traffic Service within its operations centre which has a key role in ensuring safety at sea but can also take action if the behaviour of a fishing vessels is unusual. The Marine and Freshwater Research Institute (MFRI)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 strengthened 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 ling is achieved primarily by an annual TAC. The TAC is set by the Ministry taking advice from MFRI, which is responsible for collecting and analysing scientific data on the stock. Management also includes fora for consultation with stakeholders.

The MFRI advice is based on calculations done within the framework of ICES (The International Council for

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

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

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

6 <https://www.stjornarradid.is/library/04-Raduneytin/Atvinnuvega---og-nyskopunarraduneytid/ANR-ymislegt/Stj%c3%b3rn%20fiskvei%c3%b0a%202021-2022%20-%20loka%20-%20rafr%c3%a6n%20%c3%batg%c3%a1fa%20v2.pdf>

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

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

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

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

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

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

Exploration of the Sea) by the ICES Deep Sea Working Group (WGDEEP), according to standards approved by ICES in regular benchmark assessments. 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. Since 2021, the normal procedure has been resumed.

There is a management plan in place for most commercial stocks in Iceland, including ling. 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.*¹³

When harvest rules have been established in a management plan, as for ling, the Ministry recognizes an obligation to set the TAC accordingly. The current management plan for ling was last examined and approved by ICES in 2022.¹⁴ The plan is publicly available¹⁵. 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)¹⁶. The main elements are:

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

Quotas can be transferred between vessels; this applies both to quota shares and annual catch allotments. For most stocks, including ling, quotas can also be transferred between years and between species, within limits. Quota transfer is intended to promote rationalisation and thus increase profitability in the industry as well as reducing the incentive for discarding, 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 Agnarsson & al, 2016¹⁷. A recent study of the transfer system in Iceland¹⁸ describes the performance of this system in detail and conclude 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*

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

14 <https://ices->

library.figshare.com/articles/report/Workshop_on_the_evaluation_of_assessments_and_management_plans_for_ling_tusk_plaice_and_Atlantic_wolffish_in_Icelandic_waters_WKICEMP_/19663971

15 <https://www.hafogvatn.is/static/extras/images/17-ling1326025.pdf>

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

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

18 Oostdijk & al (2020): www.pnas.org/cgi/doi/10.1073/pnas.2008001117

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 weighers¹⁹. These landings are reported to the Directorate and are the primary source of catch data. All landings have to be accounted against a quota. If the vessel does not have a quota for a landing, it has to buy one, and there is an efficient market for buying and selling quotas. To reduce the incentive for high-grading, undersized fish that is caught has to be sold. Only part of the catch is subtracted from the quota. The fisher gets a strongly reduced price and the surplus goes to a fund to promote scientific work of the MFRI.

General fishing permits are of two types, a general fishing permit with a catch quota and a general fishing permit with a hook-and-line catch quota. In addition, parts of the total TAC is set aside for special purposes (for example Strandveidar²⁰, Bygdakvoti²¹), mostly to support local communities and small scale fisheries.

Log books are compulsory, and recently, only electronic logbooks (or mobile phone apps) are accepted²². 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 2019²³. The Directorate has recently launched a map solution (Hafsjá) to inform about all closures (permanent and short term) as well as other information (Figure 1)²⁴.

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

20 <https://island.is/reglugerdir/nr/0460-2022>

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

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

23 <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21660>

and

<https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21661>

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

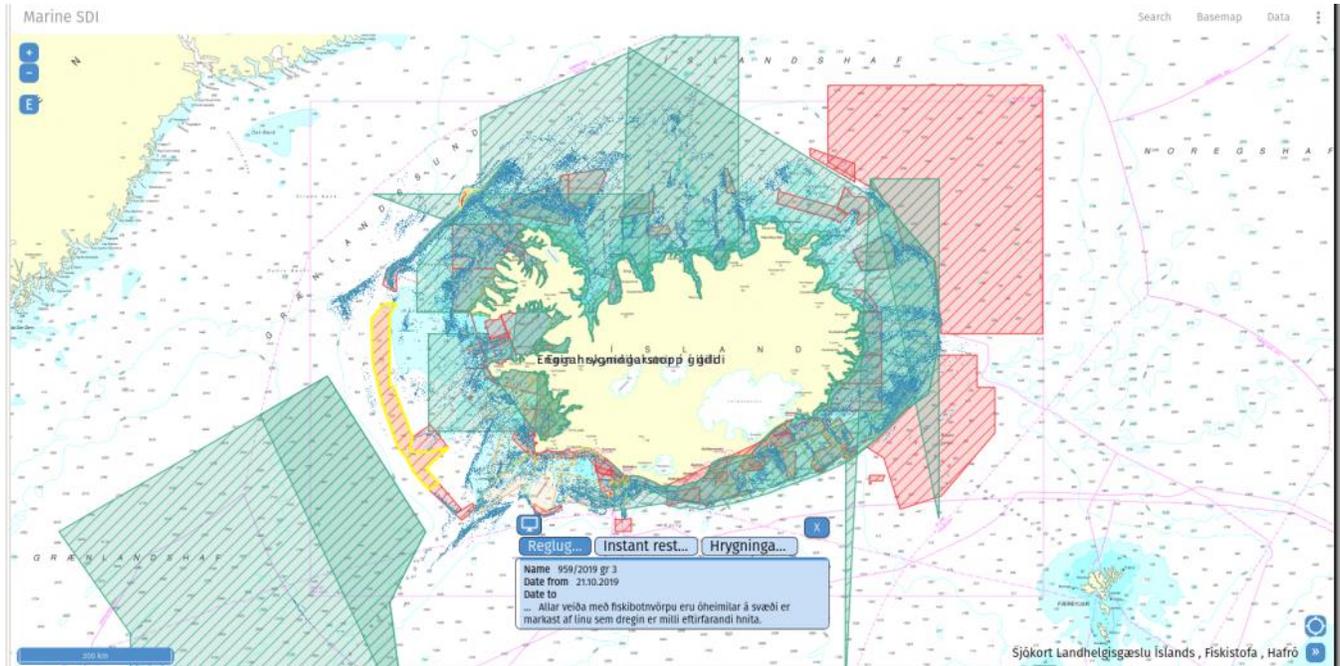


Figure 1. Screenshot of an example of the map in Hafsjá. The coloured fields are various closures. One (with yellow outline in the West) has been marked, and the label at the bottom gives details of that regulation. The small dots are location of catches (all gears in this example).

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 3 weeks. They are published on the website of the Directorate and shown in the Hafsjá map. Because of Covid restrictions and new criteria for undersized fish, there were no temporary closures last year.

There are mesh size regulations in place to protect juveniles; the standard mesh size in trawl is 135 mm²⁵. 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.²⁶ Discards are not included in the assessment and are considered to be small. To some extent they are monitored, mostly for cod and haddock. Previous studies by MRI indicate that discards of ling (and of tusk) are very small (<1% by number, <0.5% by weight)²⁷, although new ways of inspections at sea (drones) suggest that there may be more discards than previously assumed.

International relations

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

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

27 https://ices-library.figshare.com/articles/report/Report_of_the_Working_Group_on_the_Biology_and_Assessment_of_Deep-Sea_Fisheries_Resources_WGDEEP_/19291163_WGDEEP_2011: See page 89.

Policies incorporate a number of International Agreements and declarations²⁸, 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)²⁹, [the Northwest Atlantic Fisheries Organization](#) (NAFO)³⁰, and [the North Atlantic Marine Mammal Commission](#) (NAMMCO)³¹. Icelandic scientists have been involved in many international projects arranged by these organizations and in co-operative projects with research institutes and universities.

6.2 Stock status update

Stock identity

The assessment unit as defined by ICES covers ICES Division 5a, which for practical purposes is similar to the Icelandic economic zone. Ling is spread over far wider areas. The stock structure is poorly known, but substantial migrations between the main areas of occurrence is regarded as quite unlikely³². More recent genetic studies support the perception of Icelandic ling as a separate management unit³³.

Ling reaches sexual maturity at the age of 5-8 years and 60-80 cm total length. It spawns in May and June mostly along the edges of the south, southwest and west of the Icelandic continental shelf. The fishery occurs all around Iceland, but mostly in the West and South-West, where also the abundance in the survey is the highest.

Assessment method

At the benchmark in 2022 there was a change of assessment method from Gadget to the statistical catch at age state-space model SAM³⁴. The method well established and is widely used in ICES and has recently been applied to several Icelandic stocks. A detailed description of the method and the data that go into the assessment is found in the ICES report of the benchmark workshop³⁵. The main motives for the change were that the assessment with SAM is more stable over time and that SAM is simpler to implement. It was fitted using survey indices from the Spring and Autumn groundfish trawl surveys, as well as a spring gillnet survey. The model runs from 1979 onwards and ages 2 to 12 are tracked by the model, treating age 12 as a plus group.

As a state space model, SAM models a stochastic process in terms of stock numbers at age and fishing mortalities at age. Observations in SAM are assumed to arise from the process model with multivariate normal error. Patterns in the residuals were treated by including autocorrelation between ages in autumn, spring, and gillnet survey

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

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

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

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

32 https://ices-library.figshare.com/articles/report/Report_of_the_Working_Group_on_the_Biology_and_Assessment_of_Deep-Sea_Fisheries_Resources_WGDEEP_/19268468

33 Blanco Gonzalez, E., Knutsen, H., Jorde, P. E., Glover, K. A., and Bergstad, O. A. (2015). Genetic analyses of ling (*Molva molva*) in the Northeast Atlantic reveal patterns relevant to stock assessments and management advice. – ICES Journal of Marine Science, 72: 635 – 641.

34 Nielsen, A. and Berg, C. W. 2014. Estimation of time-varying selectivity in stock assessments using state-space models. Fisheries Research, 158: 96–101. <https://doi.org/10.1016/j.fishres.2014.01.014>

and Albertsen, C. M. and Trijoulet, V. 2020. Model-based estimates of reference points in an age-based state-space stock assessment model. Fisheries Research, 230: 105618. <https://doi.org/10.1016/j.fishres.2020.105618>

35 https://ices-library.figshare.com/articles/report/Workshop_on_the_evaluation_of_assessments_and_management_plans_for_ling_tusk_plaice_and_Atlantic_wolffish_in_Icelandic_waters_WKICEMP_/19663971

residuals.

Assessment data

The main data that go into the assessment are total catches since 1979, catches in numbers at age from 1993 onwards and survey indices at age from the spring and autumn trawl surveys and a gillnet survey in April. Reliable data on catch composition (age and length) are unavailable for years prior to 1993. For those years total catch by weight was used to inform on the catch levels. Age readings have been sparse, in particular prior to 2010. Most catch and survey data were disaggregated by length and were converted to data at age using age length keys, mostly from the surveys. This leads to smearing out of year classes in the data, which leads to autocorrelations that are taken into account in the assessment. A fixed natural mortality (0.15) is assumed.

Catch data. The data collection routines, sampling and surveys have remained unaltered for many years, and there are no changes this year. The fishery for ling is conducted mostly with long line (65%), mostly at depths less than 300 m and trawl (20%), mostly at depths less than 500 meters. The area of distribution of the fishery (Figure 2) largely reflects the distribution of the stock as seen in the spring survey (Figure 5). All catches of ling (as well as all other commercial fish) have to be landed in authorized ports and weighed by authorized weighers.³⁶ These landings are reported to the Directorate and are the primary source of catch data.

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

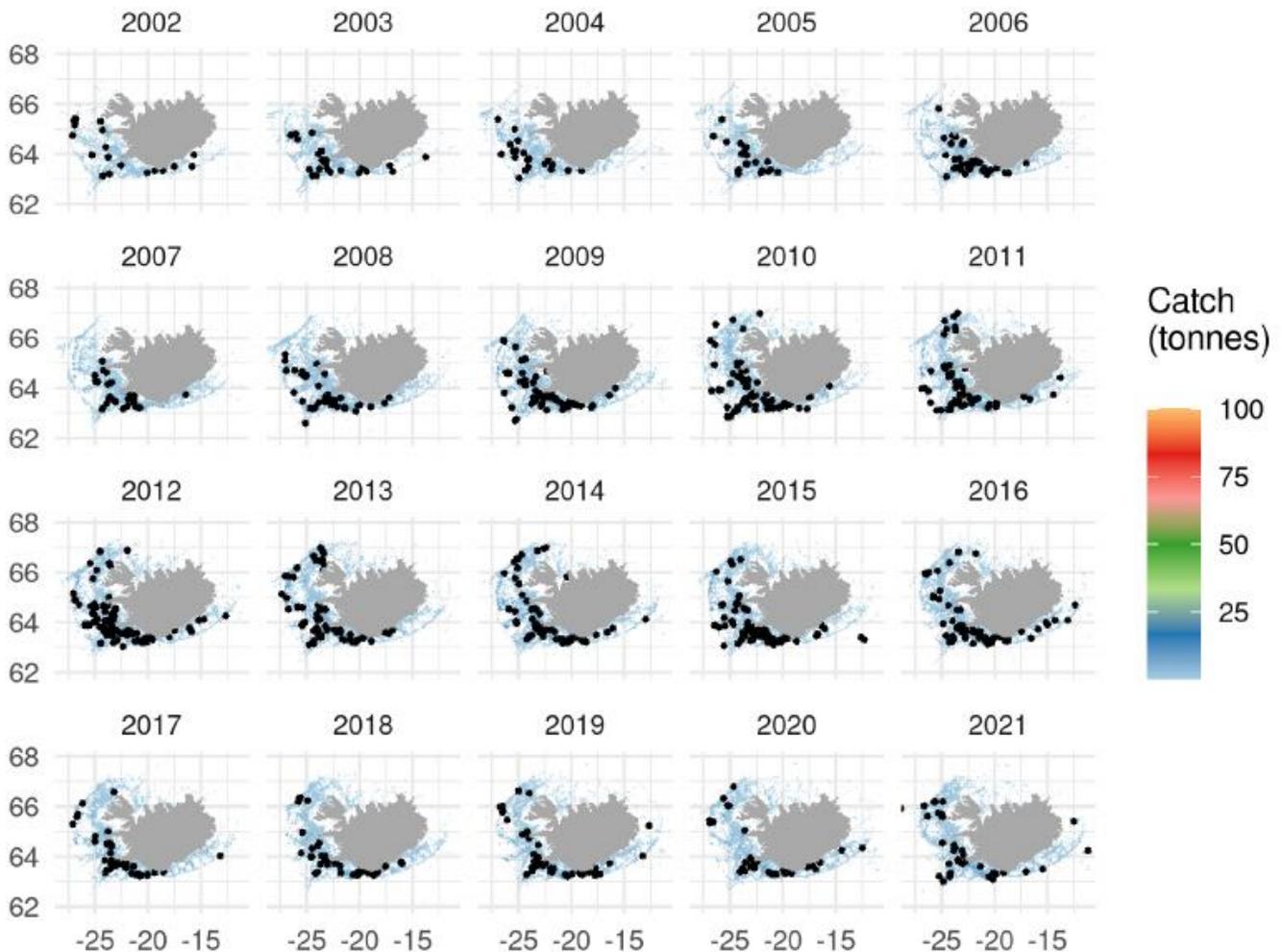


Figure 2. Geographical distribution (tonnes/square mile) of the Icelandic longline ling fishery since 2000 as reported in logbooks by the Icelandic fleet.

Biological samples from the catch are taken at sea by the fishermen or in the harbours by people from MFRI and/or inspectors from the Directorate of Fisheries. The samples are analysed by MFRI. The general process of the sampling strategy is to take one sample of ling, each consisting of 150 fish, for every 180 tonne landed. Otoliths are extracted from 50 fish which are also length measured and weighed gutted. Figure 3 shows the number of length-measured and aged (otoliths) individuals and Figure 4 shows the positions of the samples together with the area distributions of the catches. In most cases ling are landed gutted so it not possible to determine sex and maturity, but if a sample is un-gutted, sex and maturity is recorded. The number measured and aged has gone down, but according to MFRI³⁷, the sampling is considered sufficient for the purpose. The information from the samples is used along with the total landings data to estimate catch-in-weight, catch-at-age-in numbers, weight-at-age-in-the-catch, and length composition in the catch.

37 https://www.hafogvatn.is/static/extras/images/17-ling_tr1259440.pdf

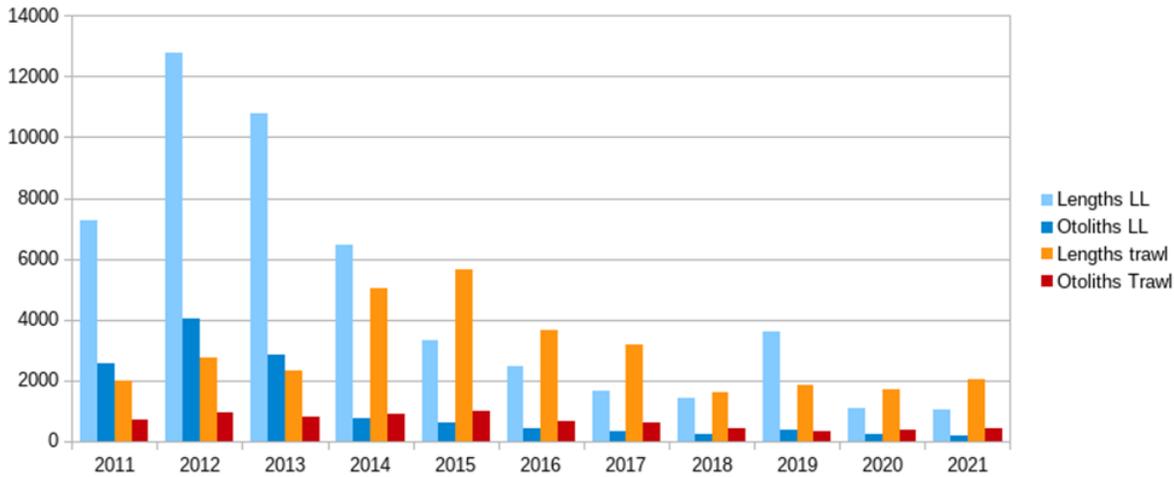


Figure 3. Number of ling length-measured and otoliths aged by gear and year. Data from MFRI assessment report 2022³⁸.

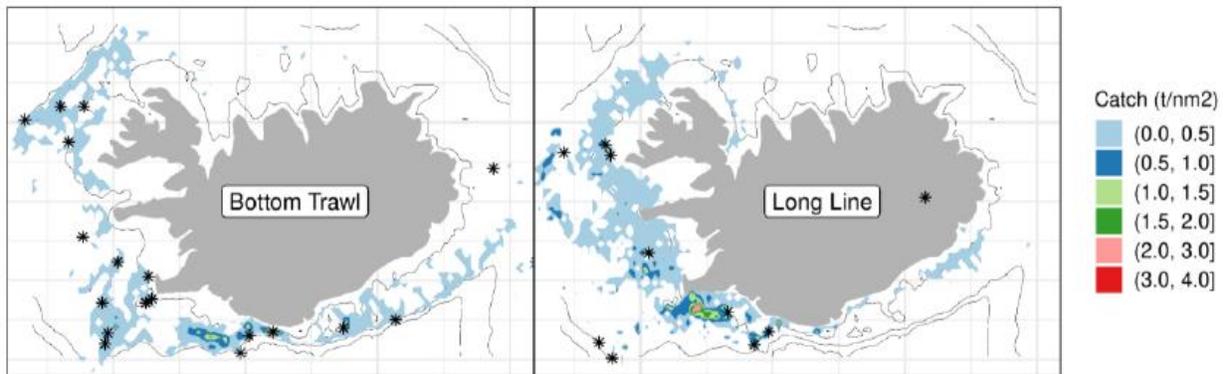


Figure 4. Location of samples and distribution of catches of ling.

Discards. In Iceland, discards are prohibited.³⁹ Ling discards are not included in the assessment but are considered to be negligible. Previous studies by MRI (2011) indicated that discards of ling (and of tusk) were very small (<1% by number, <0.5% by weight)⁴⁰.

Survey data

There is a spring groundfish survey and an autumn groundfish survey, both covering the whole Icelandic EEZ (Figure 5). 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

³⁸ https://www.hafogvatn.is/static/extras/images/17-ling_tr1259440.pdf

³⁹ <https://www.althingi.is/lagas/nuna/1996057.html>

⁴⁰ https://ices-library.figshare.com/articles/report/Report_of_the_Working_Group_on_the_Biology_and_Assessment_of_Deep-Sea_Fisheries_Resources_WGDEEP_/19291163, p. 89

from year to year in the coverage. An extensive survey manual is available⁴¹. The surveys are used for the stock assessments of most demersal species. For ling, also data from a gillnet survey in the spring are used. This survey is mostly inshore (Figure below).

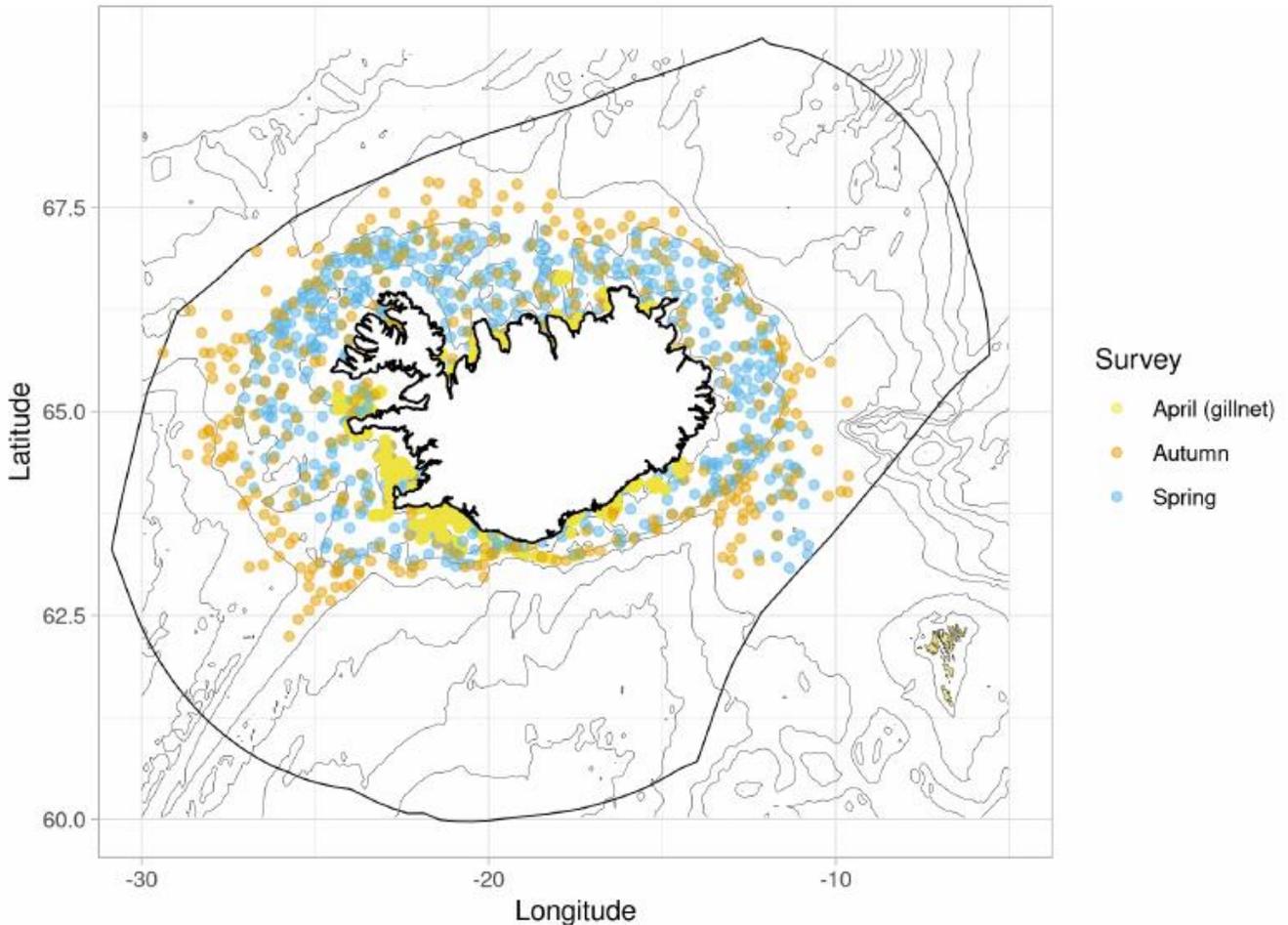


Figure 5. Stations in the Spring and Autumn groundfish surveys and the gillnet survey in 2021, which can be regarded as a typical year.

As shown in Figure 6 the survey abundance has increased since about 2005, while the relative area distribution is relatively stable. The data in the figure are from the spring survey, the other surveys are fairly similar.

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

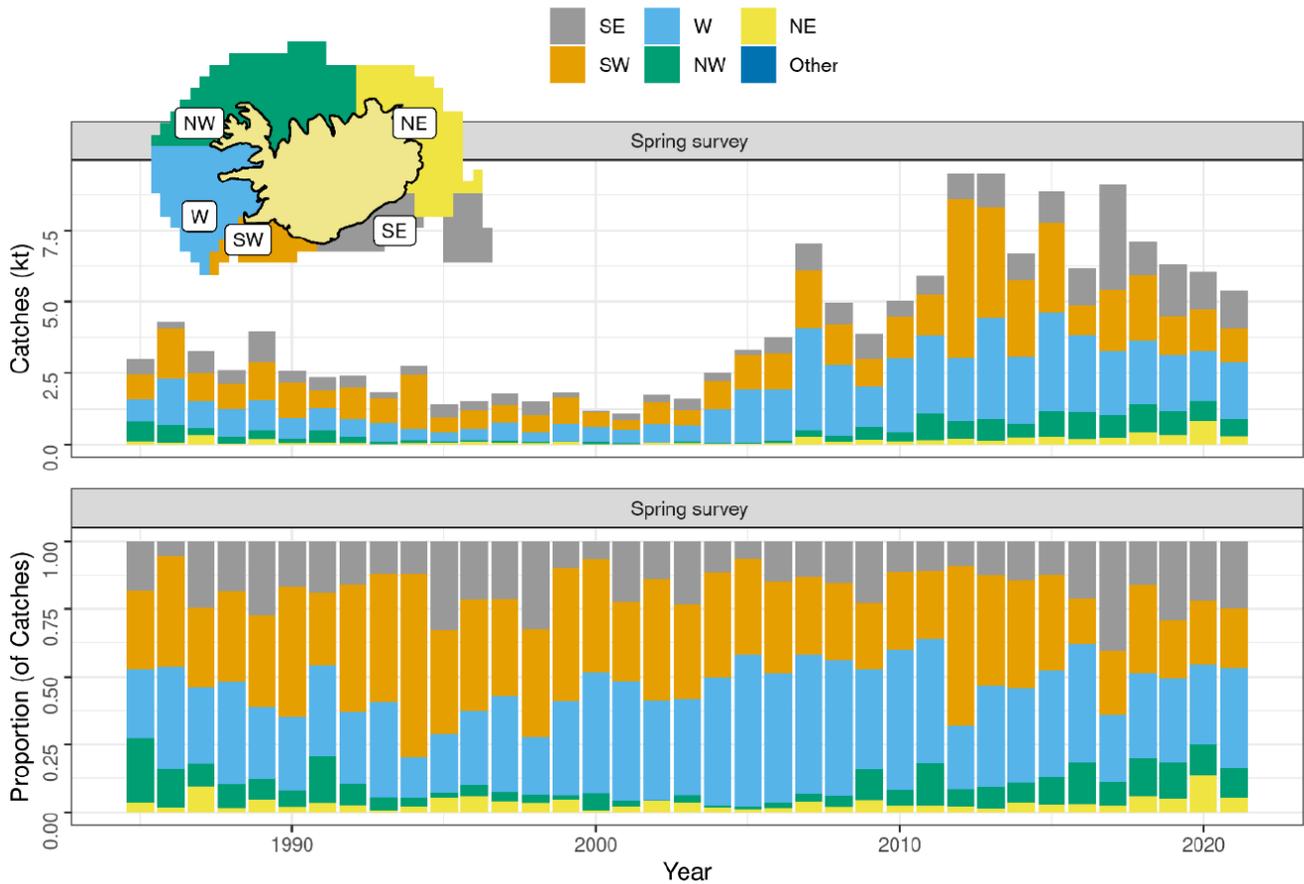


Figure 6. Area distribution (absolute and relative) of catches of ling in the spring survey.

Assessment performance

The SAM assessment tool was preferred over Gadget, that was used previously, because of better performance, in particular less retrospective error. Also, it is simpler and less work-consuming to use. Gadget fitted directly to length distributions, which was problematic, while SAM fits to age distributions after conversion of length to age.

There is still some retrospective error (Figure 7), but the results are more consistent from year to year than the Gadget results. The overall results now are fairly well in line with the previous assessments (Figure 8). The fishing mortality is now estimated to be somewhat higher than found previously and is not estimates slightly above the management target. The biomass estimate is largely within the range found previously, and the large-scale trends are similar. The data outlined above are considered relevant and sufficient for assessing the stock using the SAM method. The quality of the data is generally good, although age data are sparse in the past.

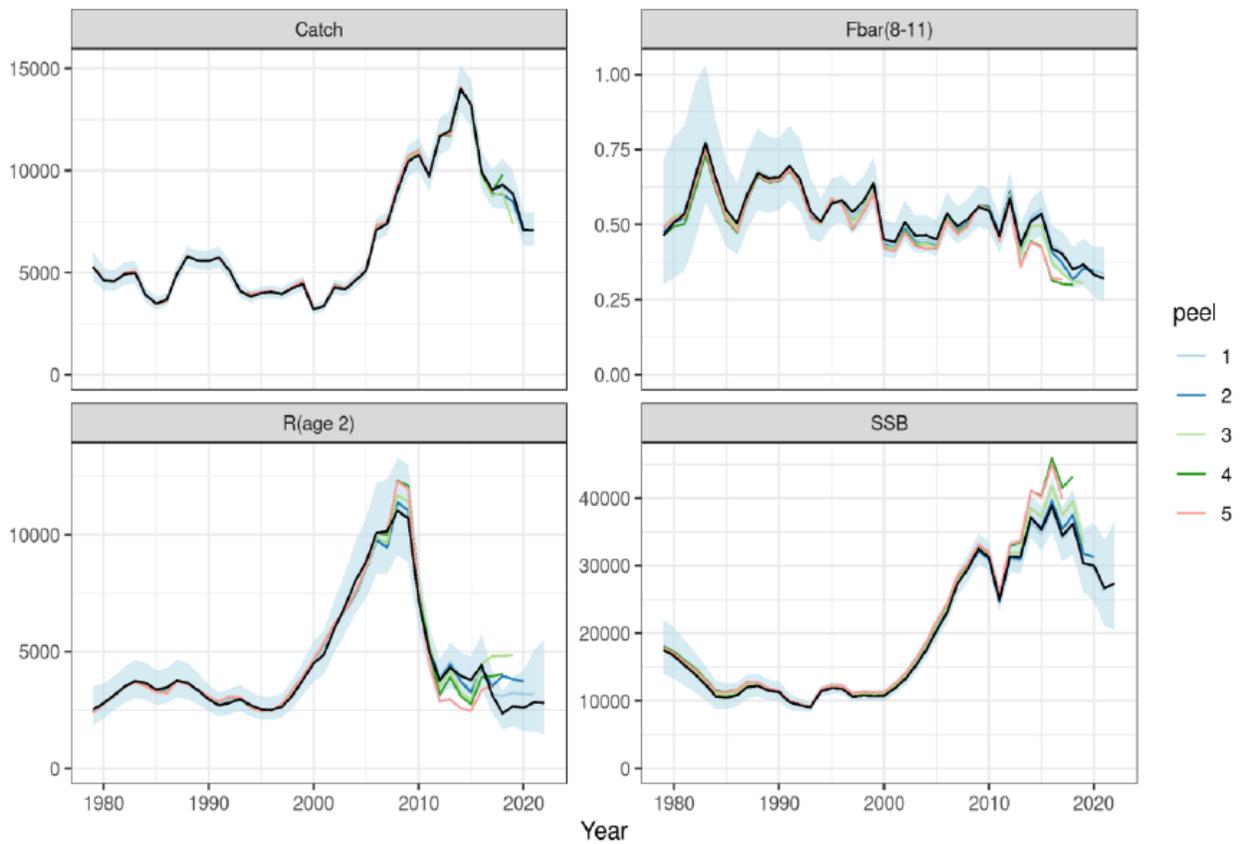


Figure 7. Analytic retrospective results (results when removing recent data)

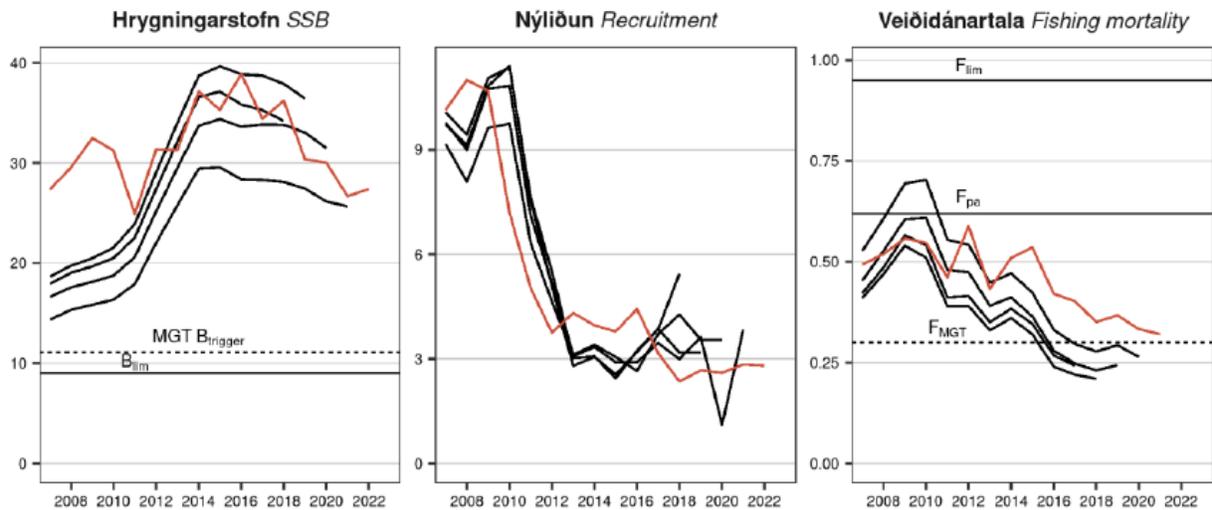


Figure 8. Historical retrospective results.

Assessment results

The main results from the 2022 MFRI stock assessment⁴² are summarized in Figure 9. There was a marked increase in recruitment in the first decade of the century, which was followed by a marked increase in biomass. Despite the year-to-year inconsistencies in the results, the stock is clearly near its historical highest, far above its trigger reference point, but declining as the effect of a period of very strong recruitments fades out. The fishing mortality has been reduced over several years and is now close to the management target.

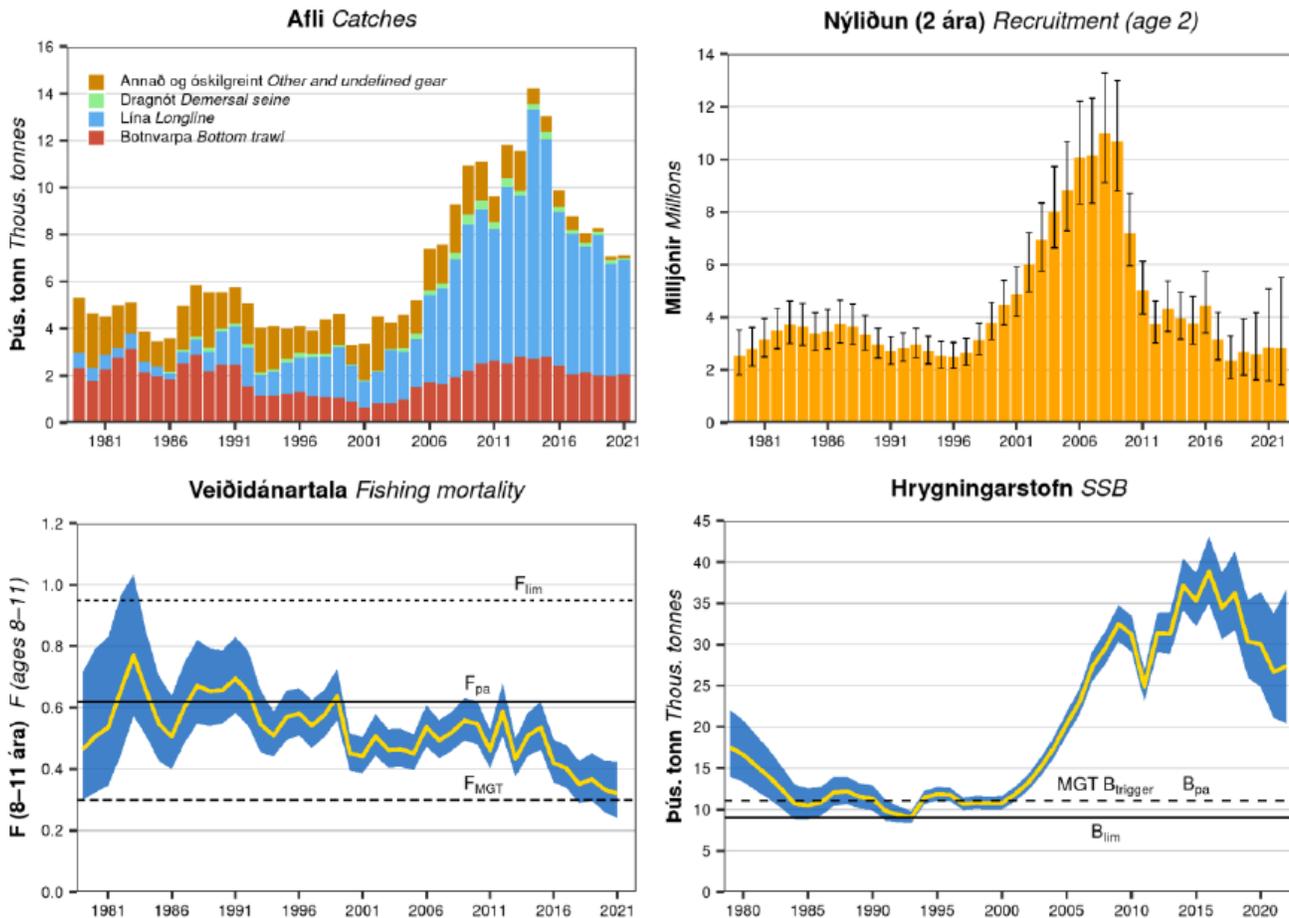


Figure 9. Main results in 2022 assessment.

Reference points and harvest rule

Reference points were revised according to present standards in ICES and the results of the revised assessment. Likewise, the harvest rule was revised. The harvest rule is similar to the previous one but with slightly different parameters and with fishing mortality rather than harvest rate as exploitation measure. They were approved by ICES⁴³ and adopted by Icelandic authorities. Compatible reference points are incorporated in the management plan. The values are tabulated in Table 5.

⁴² <https://www.hafogvatn.is/static/extras/images/17-ling1326026.pdf>

⁴³ https://ices-library.figshare.com/articles/report/Iceland_request_for_evaluation_of_a_harvest_control_rule_for_ling_in_Icelandic_waters/19625736

Table 5. Reference points for Ling set in 2022.

| Framework | Reference point | Value | Technical basis |
|------------------------|-------------------|--------|---|
| MSY Approach | MSY $B_{trigger}$ | 11 100 | B_{pa} |
| | F_{MSY} | 0.30 | F that produces MSY in the long term |
| Precautionary Approach | B_{lim} | 9000 | B_{loss} (SSB in 1993) |
| | B_{pa} | 11 100 | $B_{lim} \times e^{1.645 \cdot \sigma B}$ |
| | F_{lim} | 0.95 | Fishing mortality that in stochastic equilibrium will result in median SSB at B_{lim} . |
| | F_{pa} | 0.62 | Maximum F at which the probability of SSB falling below B_{lim} is <5% |
| Management plan | MGT $B_{trigger}$ | 11 100 | According to the harvest control rule |
| | F_{MGT} | 0.30 | According to the harvest control rule |

Targets and limits. In accordance with the present ICES standard⁴⁴, the starting point for deriving the precautionary reference points is the lowest observed biomass (B_{loss}) in the time series (in 1993), which was taken as B_{lim} . B_{pa} was set at the upper 95-percentile of B_{lim} , assuming a $\sigma = 0.212$. The fishing mortality limit is set at the level which would lead SSB to B_{lim} with 50% probability and F_{pa} at the highest level that has a <5% probability of leading below B_{lim} .

Precautionary mortality reference points were derived according to standard practise: F_{lim} as the F where the median SSB is at B_{lim} , and F_{pa} as the F that corresponds to a 5% probability of the true F being above F_{lim} . The HR reference points were derived as the median HR when fishing at reference F_s .

MSY reference points were found by stochastic yield per recruit calculations. F_{MSY} was found at 0.284, corresponding to a harvest rate of 0.24. The MSY $B_{trigger}$ was set at B_{pa} according to standard practise.

Management plan

In the revised management plan, TAC set using the ICES advice rule with a fishing mortality $F_{MGT} = 0.30$ applied to ages 8–11, modified by the ratio $SSB_y / MGT B_{trigger}$ when $SSB_y < MGT B_{trigger}$. The expected range of realized fishing mortalities (F) following the management plan (F_{MGT}) is between 0.21 and 0.44.⁴⁵ According to the request from Iceland, the following plan was tested and found to be consistent with the precautionary approach and to conform with the ICES MSY framework. The tested harvest rule was:

The HCR is applied to calculate the annual total allowable catch (TAC) based on a forecast from the assessment model with a target fishing mortality on the ages 8 to 11, F_{MGT} , set as 0.30. The TAC for the fishing year $y/y+1$ (September 1 of year y to August 31 of year $y+1$) is then calculated from the catch projection for the fishing year. If the spawning stock biomass (SSB) falls below 11 100 tonnes ($MGT B_{trigger}$), the harvest control rule dictates that F_{MGT} shall be reduced linearly to zero based on the ratio between the SSB estimated and $MGT B_{trigger}$.

⁴⁴ https://ices-library.figshare.com/articles/report/Advice_on_fishing_opportunities/18638141

⁴⁵ <https://www.hafogvatn.is/static/extras/images/17-ling1326025.pdf>

The harvest rule was tested by simulations with a forward projecting bootstrap procedure without assessment feedback, but taking uncertainty in process into account, in particular in recruitment, as well as assessment uncertainty, both including autocorrelations. This risk evaluation assumes that the TAC is set according to the target harvest rate. If the subsequent estimate of realized harvest rate is above the target, the obvious recipe would be to apply the rule next year. The results of simulations of the HCR in terms of equilibrium yield and SSB for a range of F values are given in Figure 9.

With a fishing mortality (F) of 0.30, catch is maximized while probabilities of $SSB < Blim$ remain less than 5% in all years. As the yield curve has a flat peak, F values ranging from 0.19 to 0.56 are expected to maintain 95% of the catch at MSY while maintaining SSB above Blim with a probability of 95% or greater (see Figure 9).

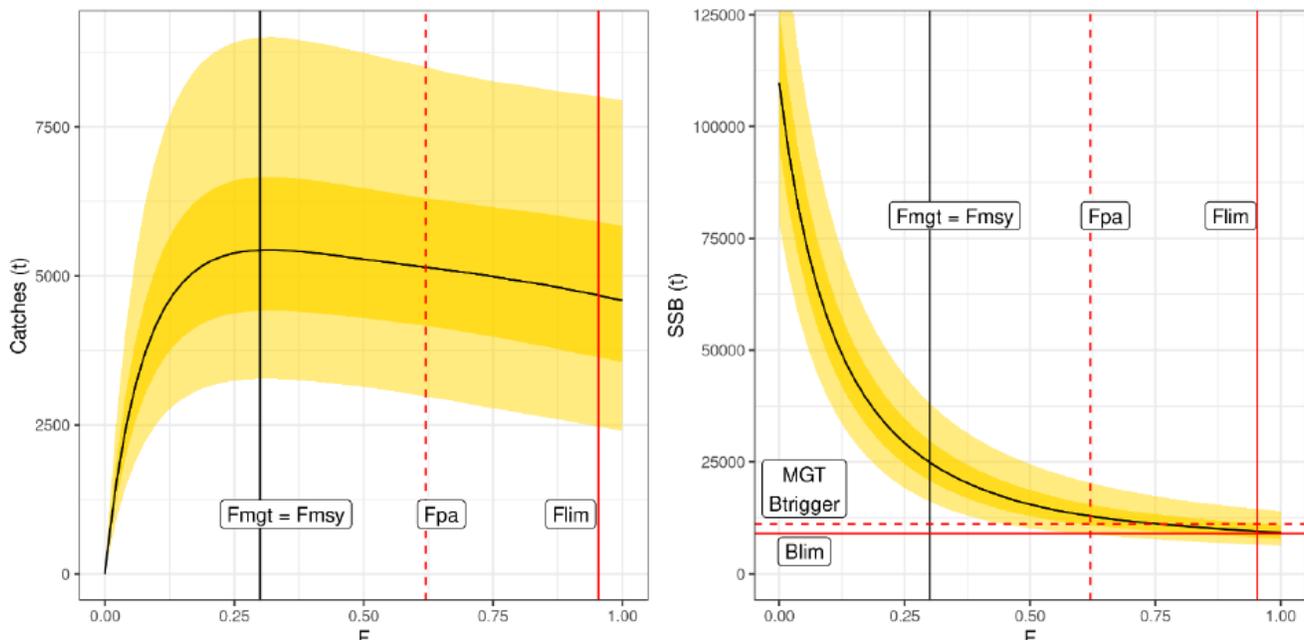


Figure 10. Ling in Division 5.a. Equilibrium catches (in tonnes, left panel) and corresponding SSB (in tonnes, right panel) as a function of fishing mortality implemented in the HCR. In both panels, the solid curves indicate the median of the distribution and the ribbons the 5th and 95th and 25th and 75th percentiles. The black vertical line corresponds with FMGT (0.30). Red vertical lines correspond with F_{p05} (dashed) and F_{lim} (solid). The dashed and solid red horizontal lines are MGT Btrigger (11 000 tonnes) and Blim (9 000 tonnes), respectively.

A long-term target for the stock biomass is not defined explicitly, as the harvest strategy is defined in terms of exploitation rate. The expected long-term yield when following the rule was tested by the simulations and found to be near the maximum obtainable. The existing rules, together with strong mechanisms for implementation and enforcement, are regarded as sufficient to protect against overfishing. In addition, there are supportive measures (area closures, gear restrictions, discard ban, strict landings control and control at sea) that contribute to keeping exploitation under control.

International approval

ICES⁴⁶ 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 and the management plan for ling were evaluated and approved in 2022.⁴⁷

Stock assessment and advice, including advice on harvest rules, TACs and reference points is provided by ICES. The process involves all relevant nations, and the advice is for all areas. The advice is taken over by local authorities and published on the MFRI website once it is ready ⁴⁸.

The Icelandic ling stock is a local stock confined to Icelandic waters and is managed by Iceland alone. The Minister of Fisheries and Agriculture decides on the TAC of the ling stock for each fishing year (Sept –Aug) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned above.

6.3 Landings update

The information in this section is taken from the Icelandic assessment report.⁴⁹ The area distribution of the catches has been stable over many years (Figure 11, see also **Figure 2**). The fishery for ling is conducted mostly with long line (65%), mostly at depths less than 300 m, and with trawl (20%), mostly at depths less than 500 meters. This is also unchanged from previous years.

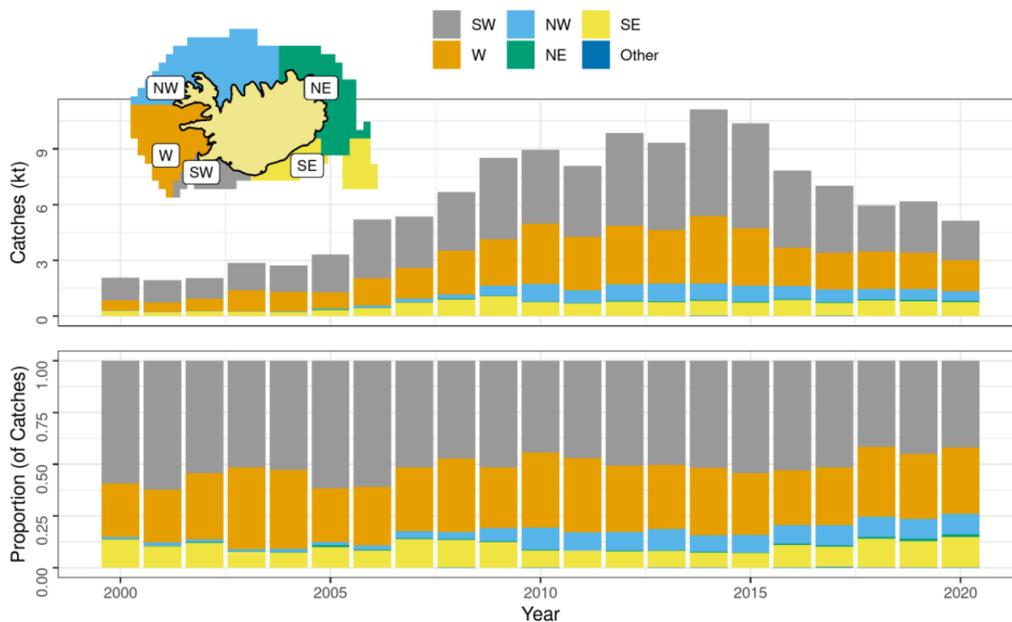


Figure 11. Catches of ling by area.

As shown in Figure 12, the recruitment increased gradually from 2000 onwards, until about 2010. The fishing mortality also increased, as well as the catches. Despite the larger fishing mortality, the SSB also increased. Since

⁴⁶ <http://www.ices.dk>

⁴⁷ <https://ices->

library.figshare.com/articles/report/Iceland_request_for_evaluation_of_a_harvest_control_rule_for_ling_in_Icelandic_waters/19625736

⁴⁸ <https://www.hafogvatn.is/static/extras/images/17-ling1326025.pdf>

⁴⁹ https://www.hafogvatn.is/static/extras/images/17-ling_tr_isl1326028.pdf

about 2010, the fishing mortality has been reduced, and the reduction continued after the management plan was introduced in 2017. The SSB reached a peak in 2016 and has declined since then in line with the reduced recruitment. Accordingly, some decrease in stock and catches is to be expected in the coming years. The SSB is still high, however.

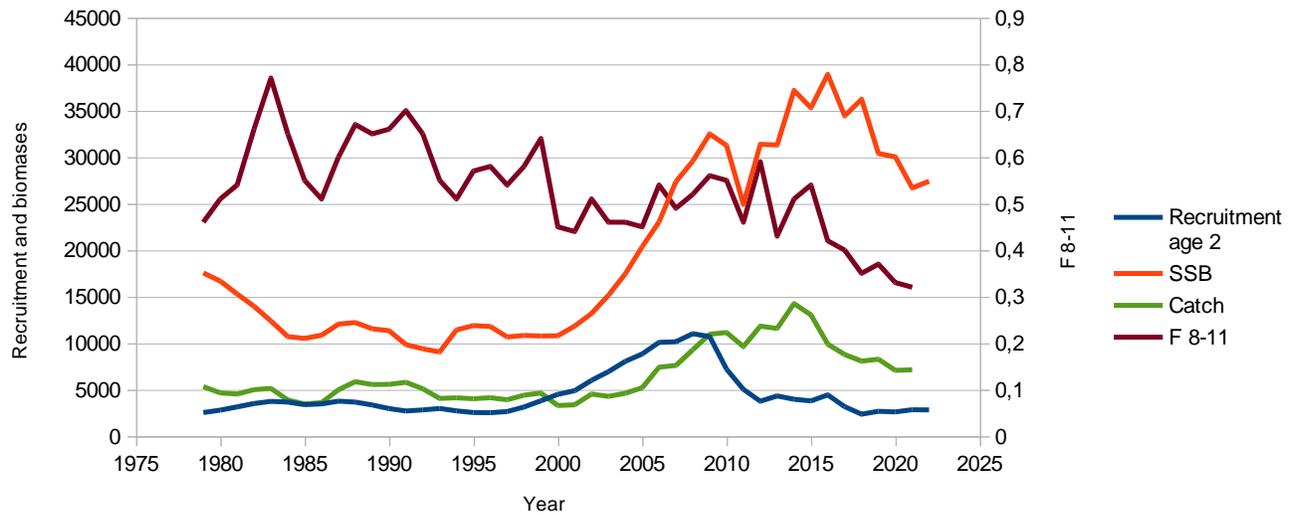


Figure 12. History of stock and exploitation according to the assessment in 2021.

Adherence to the advice, quotas and catches is shown in Table 6. 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 expected catch by other nations (Faroes and Norway) has not been taken into account when setting the National TAC. The actual catch has deviated from the TAC, up to about 15% in both directions. In addition to catches by foreign nations, a likely cause is the flexibility that is permitted. The deviations is to a large extent due to transfers between years, and also between species (Figure 13). A ling quota can be used to cover catches of other species (negative transfers) or quotas of other species can be used to cover catches of ling (positive transfers).

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

| Fiskveiðiár <i>Fishing year</i> | Tillaga <i>Recommended TAC</i> | Aflamark <i>National TAC</i> | Afli Íslendinga <i>Catches Iceland</i> | Afli annarra þjóða <i>Catches other</i> | Afli alls <i>Total catch</i> |
|------------------------------------|-----------------------------------|---------------------------------|---|--|---------------------------------|
| 2010/2011 | 7 500 | 7 500 | 9 327 | 768 | 10 095 |
| 2011/2012 | 8 800 | 9 000 | 10 074 | 1 059 | 11 133 |
| 2012/2013 | 12 000 | 12 000 | 11 196 | 1 249 | 12 445 |
| 2013/2014 | 14 000 | 14 000 | 11 794 | 1 188 | 12 982 |
| 2014/2015 | 14 300 | 14 300 | 11 684 | 1 974 | 13 658 |
| 2015/2016 | 16 200 | 16 200 | 9 773 | 1 456 | 11 229 |
| 2016/2017 | 9 343 | 9 343 | 7 291 | 1 135 | 8 426 |
| 2017/2018 | 8 598 ¹⁾ | 8 598 | 7 017 | 1 309 | 8 326 |
| 2018/2019 | 6 255 ¹⁾ | 6 255 | 6 927 | 1 101 | 8 028 |
| 2019/2020 | 6 599 ¹⁾ | 6 599 | 5 972 | 1 183 | 7 155 |
| 2020/2021 | 5 700 ¹⁾ | 5 700 | 6 201 | 1 013 | 7 214 |
| 2021/2022 | 4 735 ¹⁾ | 4 735 | | | |
| 2022/2023 | 6 098 ²⁾ | | | | |

¹⁾ 18 % aflaregla – 18% harvest control rule

²⁾ Aflaregla byggð á ICES ráðgjafarreglu með $F_{MGT} = 0.30$ – Harvest control rule based on ICES advice rule ($F_{MGT} = 0.30$)

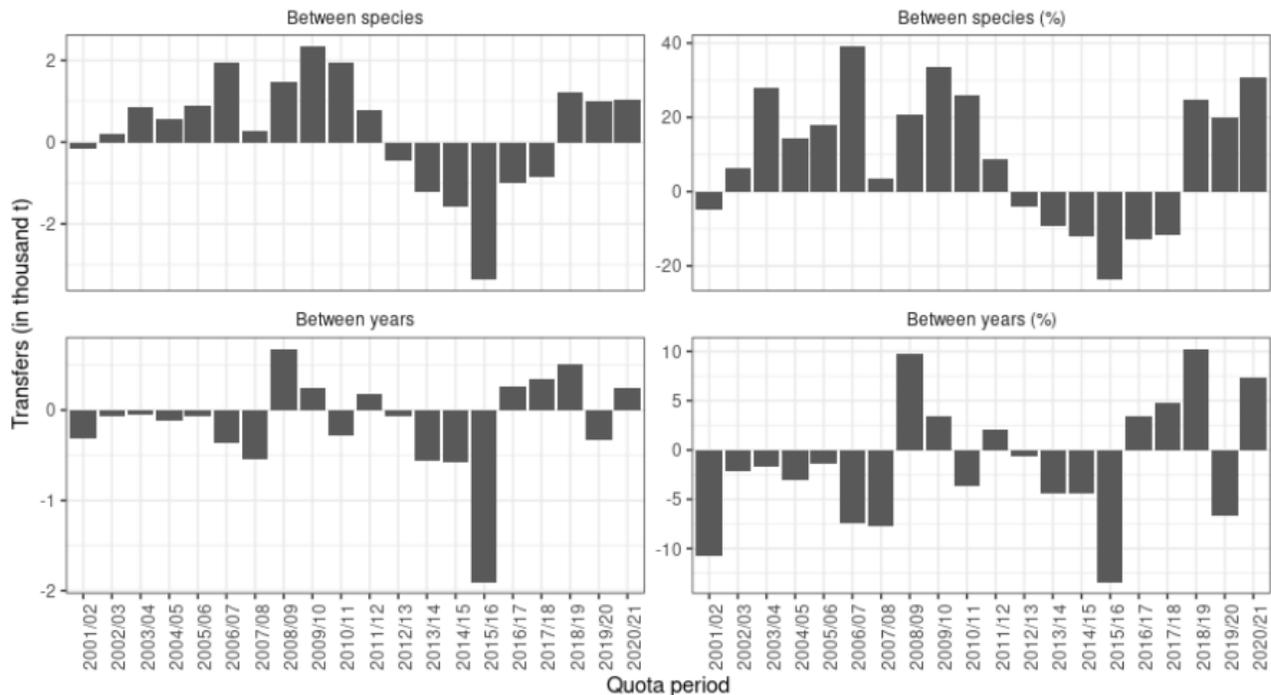


Figure 13. Net transfer of quota to and from ling in the Icelandic ITQ system by fishing year. Between species (upper): Positive values indicate a transfer of other species to ling, but negative values indicate a transfer of ling quota to other species. Between years (lower): Transfer of quota from given quota year to the next quota year.

6.4 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)⁵⁰, the Fisheries Management Act (no. 116/2006)⁵¹, 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 catches⁵². 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 1996⁵³). Provisions of the Act on a Special Fee for Illegal Marine Catch⁵⁴ 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 2019⁵⁵ and 2020⁵⁶.

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,

⁵⁰ <https://www.althingi.is/lagas/149a/1992036.html>

⁵¹ <https://www.ecolex.org/details/legislation/fisheries-management-act-1990-lex-faoc003455/>

⁵² <http://www.fiskistofa.is/english/about-the-directorate/>

⁵³ <https://www.althingi.is/lagas/149a/1996057.html>

⁵⁴ <https://www.althingi.is/lagas/149a/1992037.html>

⁵⁵ <http://www.fiskistofa.is/umfiskistofu/frettir/aflasamsetning-a-botnvorpu-og-dragnotarveidum>

⁵⁶ <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 Resources⁵⁷.

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 298/2020⁵⁸. The App also called Afladagbókina or catch diary⁵⁹ ⁶⁰ 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)⁶¹ 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 violators⁶².

⁵⁷ <https://www.stjornartidindi.is/Advert.aspx?RecordID=884be309-64a5-4367-9e4d-f5e7216b6f40>

⁵⁸ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

⁵⁹ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

⁶⁰ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

⁶¹ <https://rikisendurskodun.is/wp-content/uploads/2019/01/Eftirlit-Fiskistofu-Stjornsysluutpekt.pdf>

⁶² <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 990/2020⁶³ 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 Fisheries ⁶⁴.

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)⁶⁵.

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.⁶⁶

All scientific advice is available online⁶⁷. 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 website⁶⁸.

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.

⁶³ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/22140>

⁶⁴ http://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

⁶⁵ <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2021/09/23/Stjorn-fiskveida-2021-2022-Log-og-reglugerdir/>

⁶⁶ <http://www.fiskistofa.is/>

⁶⁷ <https://www.ices.dk/advice/Pages/Latest-Advice.aspx>

⁶⁸ <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.

6.4.1 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 2020⁶⁹ and 2021 Annual Report⁷⁰. 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 |
| Framhjálföndun / 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 |

6.4.2 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.

⁶⁹ https://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

⁷⁰ <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 14. 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.

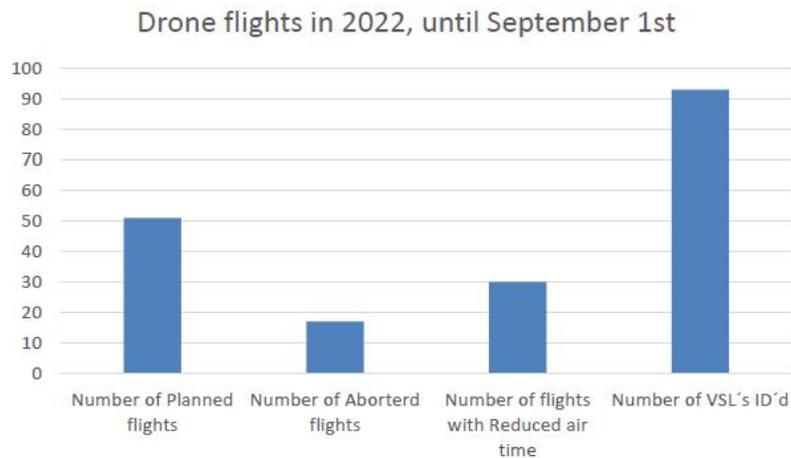


Figure 15. Air Surveillance hours by RPAS (drone) between May 31st until August 31st 2022.

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)

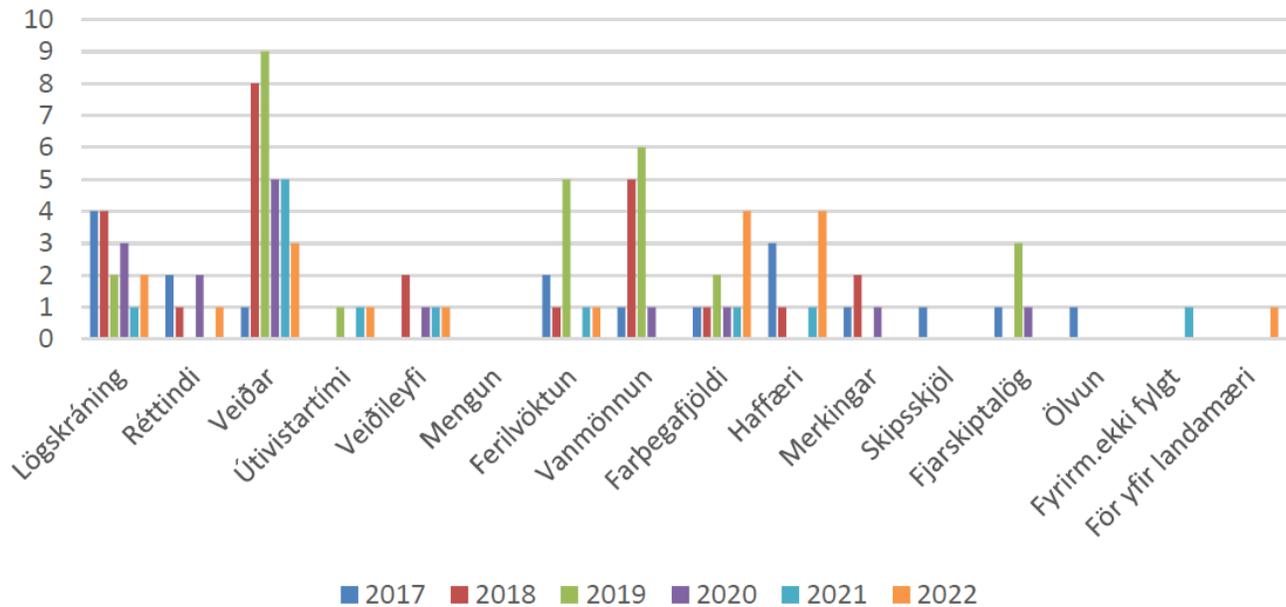


Figure 16. Overview of ICG infringement reports in 2017- (1st September) 2022. Source: provided by the ICG on the 8th of November 2022.

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.

6.5 Bycatch, habitat and ecosystem update

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 ling full assessment⁷¹. A status update on each of these species has been provided.

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

Status of bycatch and associated species in the common ling target and non-target fisheries as identified during the full assessment from historic average catches for each relevant gear type. All data and information is derived from the MFRI Advice page⁷² for each individual species.

PORSKUR – COD (*Gadus morhua*)⁷³

Fishing pressure is above HRMGT and HRMSY but below HRpa; spawning stock size is above MSY Btrigger, Bpa, and Blim.

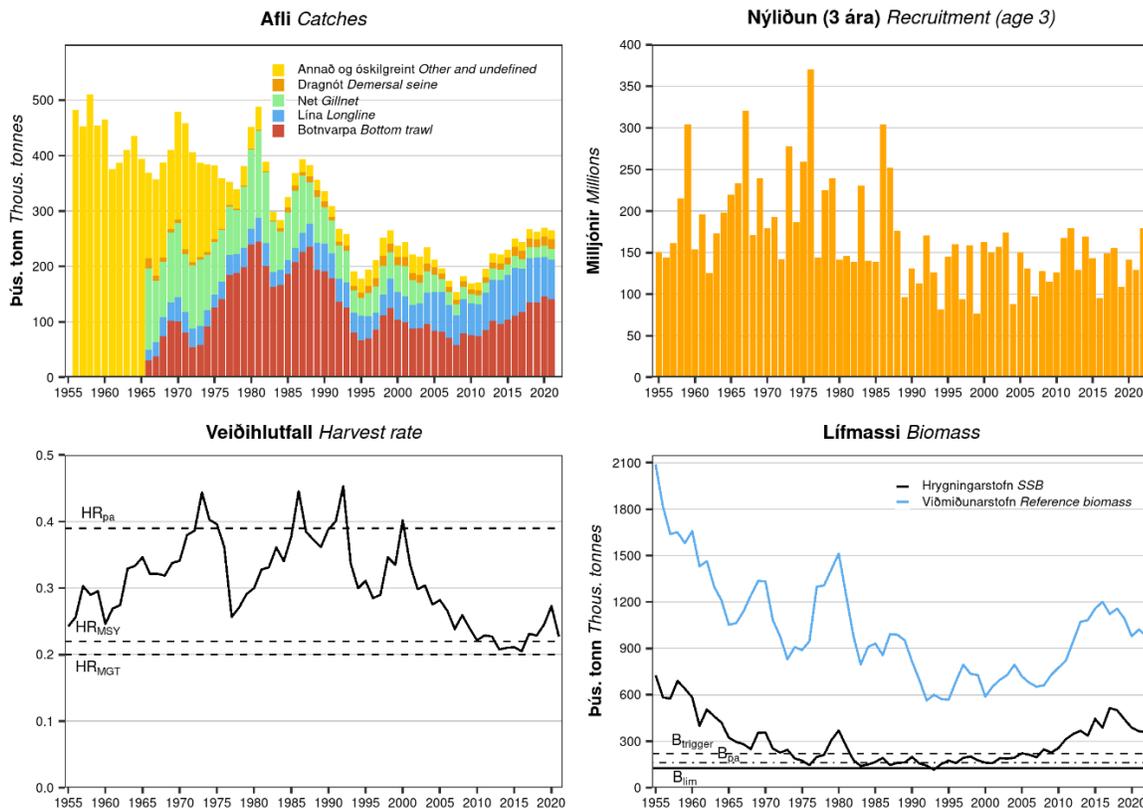


Figure 17. Icelandic cod harvest rate and biomass.

⁷¹ <https://www.responsiblefisheries.is/media/1/form-11.2-icelung-initial-assessment-final-report-and-determination-1.pdf>

⁷² <https://www.hafogvatn.is/en/harvesting-advice>

⁷³ <https://www.hafogvatn.is/static/extras/images/01-cod1325962.pdf>

ÝSA – HADDOCK (*Melanogrammus aeglefinus*)⁷⁴

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.

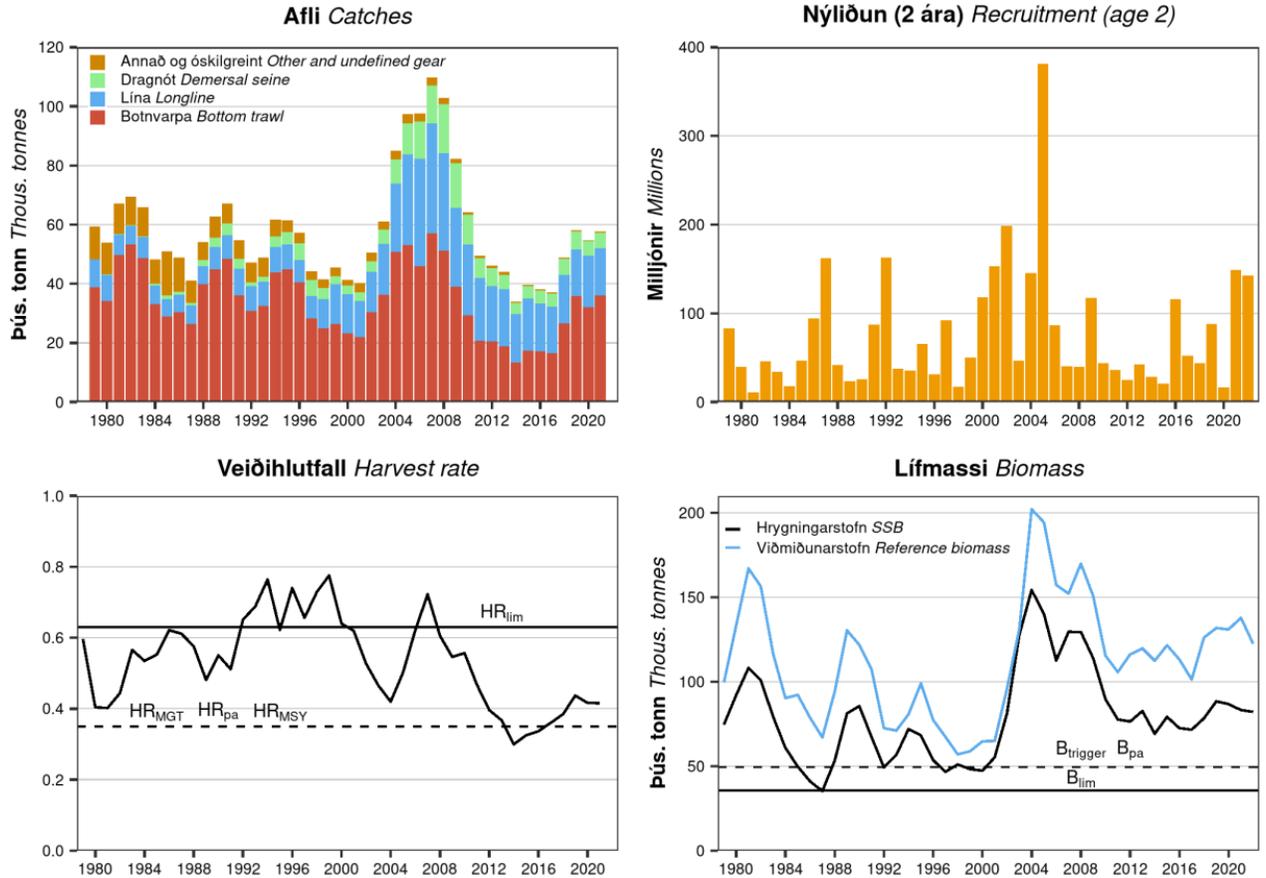


Figure 18. Icelandic haddock harvest rate and biomass.

UFSI – SAITHE (*Pollachius virens*)⁷⁵

Fishing pressure is above HRMGT and HRMSY but below HRpa, and HRLim; spawning stock size is above MSY Btrigger, Bpa, and Blim and Blim.

⁷⁴ <https://www.hafogvatn.is/static/extras/images/02-haddock1325964.pdf>

⁷⁵ <https://www.hafogvatn.is/static/extras/images/03-saithe1325968.pdf>

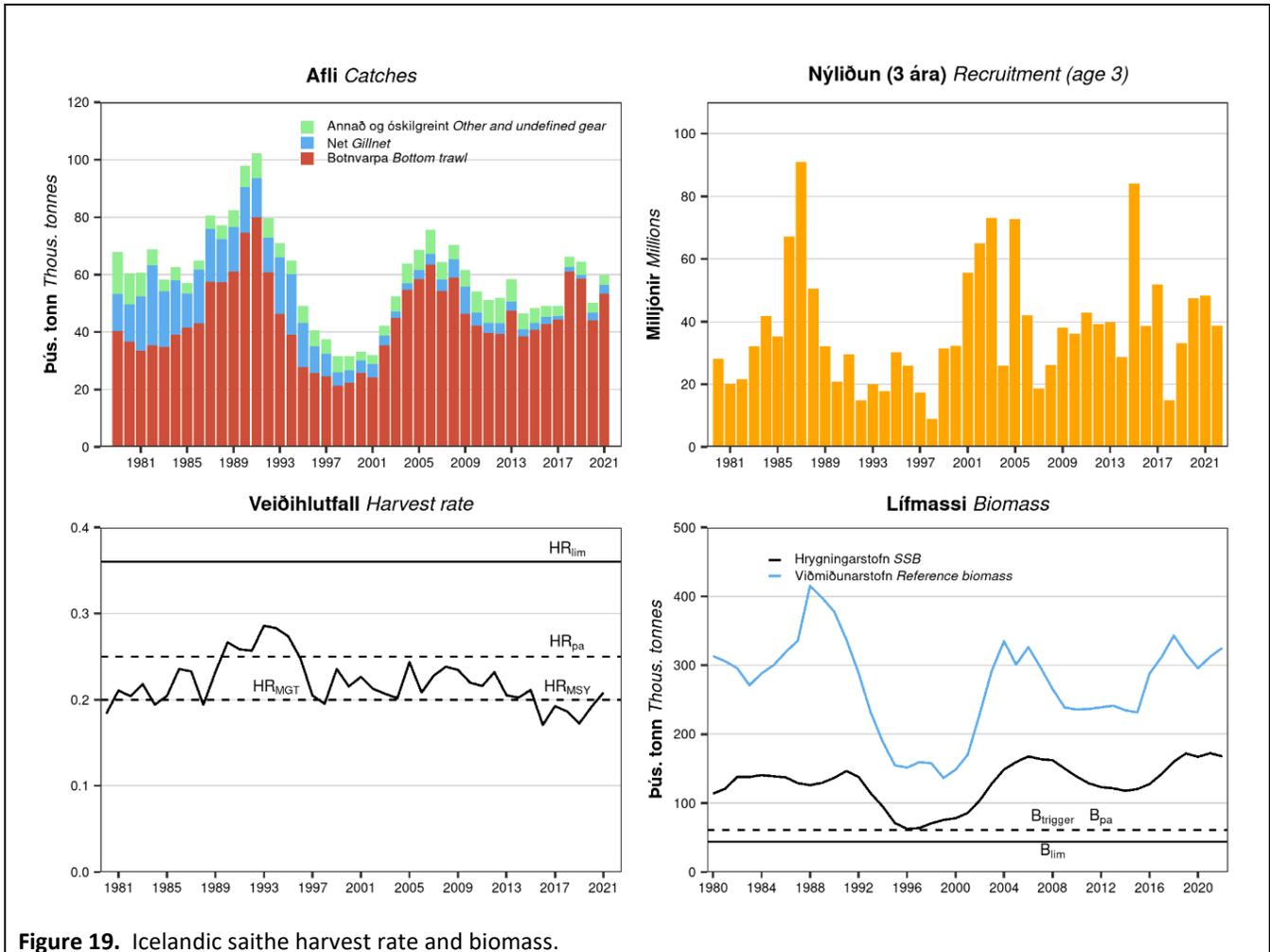


Figure 19. Icelandic saithe harvest rate and biomass.

GULLKARFI – GOLDEN REDFISH (*Sebastes norvegicus*)⁷⁶

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

⁷⁶ <https://www.hafogvatn.is/static/extras/images/05-goldenredfish1328558.pdf>

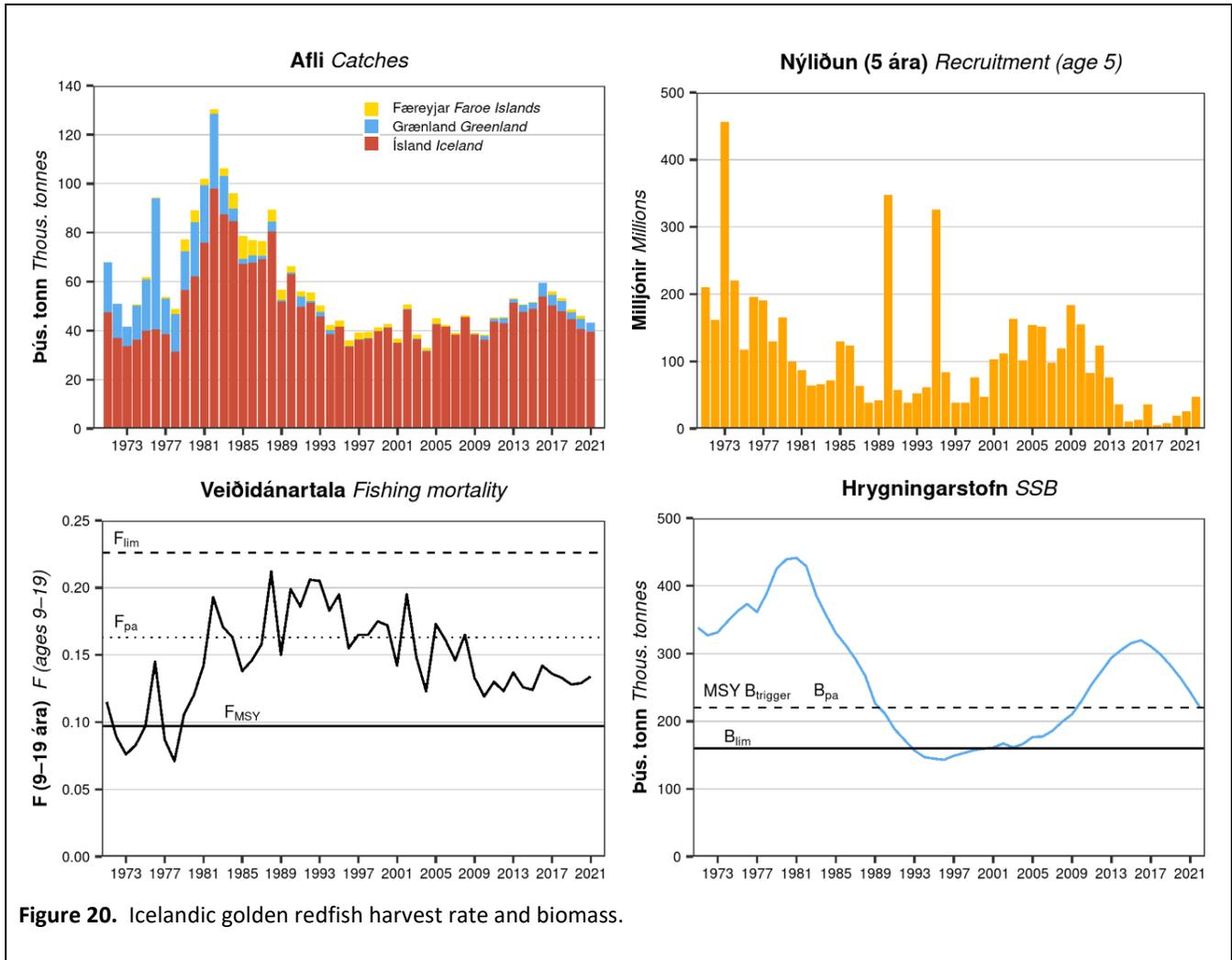


Figure 20. Icelandic golden redfish harvest rate and biomass.

DJÚPKARFI – DEMERSAL BEAKED REDFISH (*Sebastes mentella*)⁷⁷

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.

⁷⁷ <https://www.hafogvatn.is/static/extras/images/05-demersalsmentella1325976.pdf>

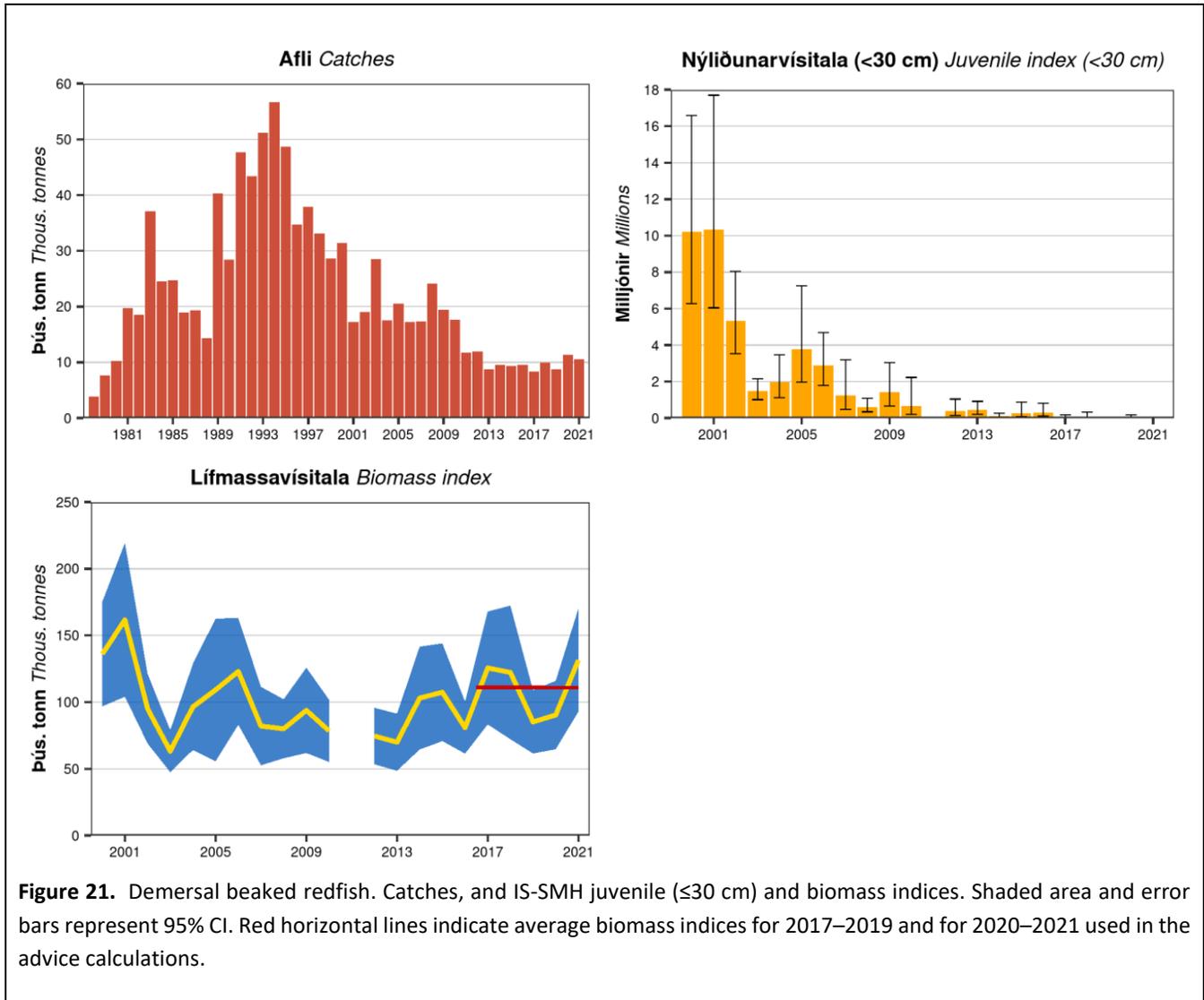


Figure 21. Demersal beaked redfish. Catches, and IS-SMH juvenile (≤ 30 cm) and biomass indices. Shaded area and error bars represent 95% CI. Red horizontal lines indicate average biomass indices for 2017–2019 and for 2020–2021 used in the advice calculations.

GRÁLÚÐA – GREENLAND HALIBUT (*Reinhardtius hippoglossoides*)⁷⁸

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.

⁷⁸ <https://www.hafogvatn.is/static/extras/images/08-greenlandhalibut1325988.pdf>

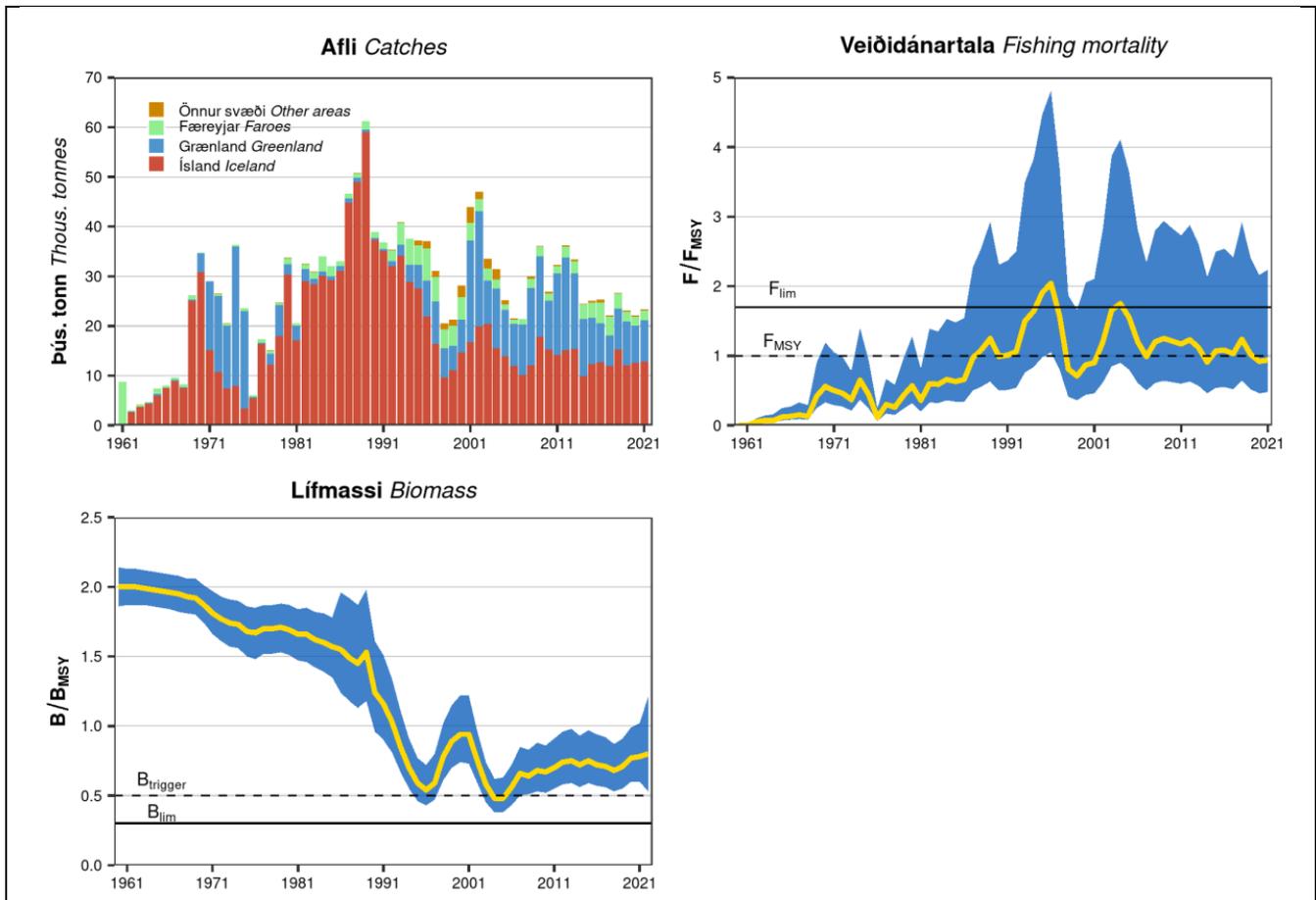


Figure 22. Greenland halibut harvest rate and biomass.

STEINBÍTUR–ATLANTIC WOLFFISH (*Anarhichas lupus*)⁷⁹

Fishing pressure on the stock is above FMGT, and F_{pa} but below F_{lim} ; spawning-stock size is above MGT $B_{trigger}$, B_{pa} and B_{lim} .

⁷⁹ <https://www.hafogvatn.is/static/extras/images/15-atlanticwolffish1326018.pdf>

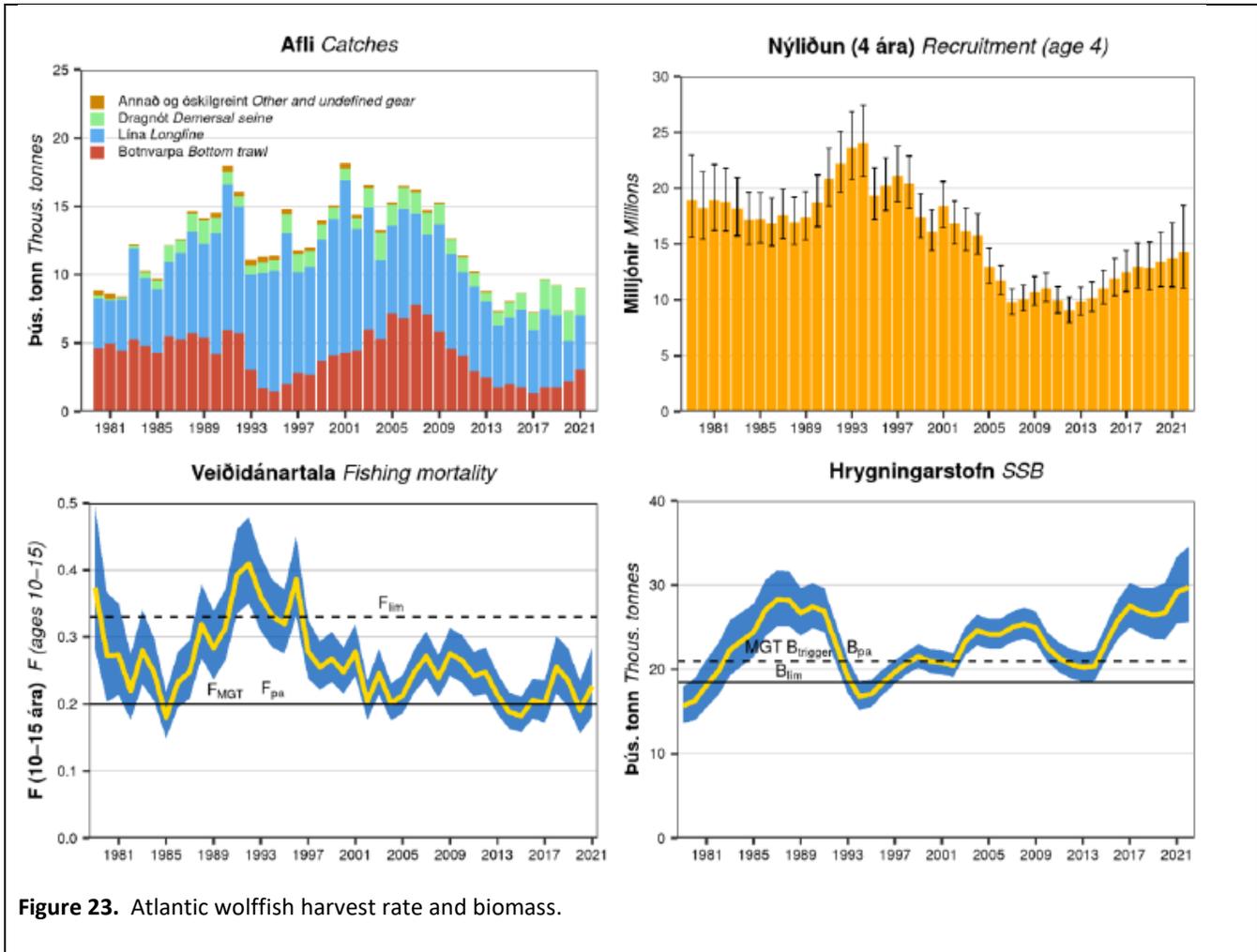


Figure 23. Atlantic wolffish harvest rate and biomass.

GULLLAX – GREATER SILVER SMELT (*Argentina silus*)⁸⁰

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

⁸⁰ <https://www.hafogvatn.is/static/extras/images/23-greatersilversmelt1326050.pdf>

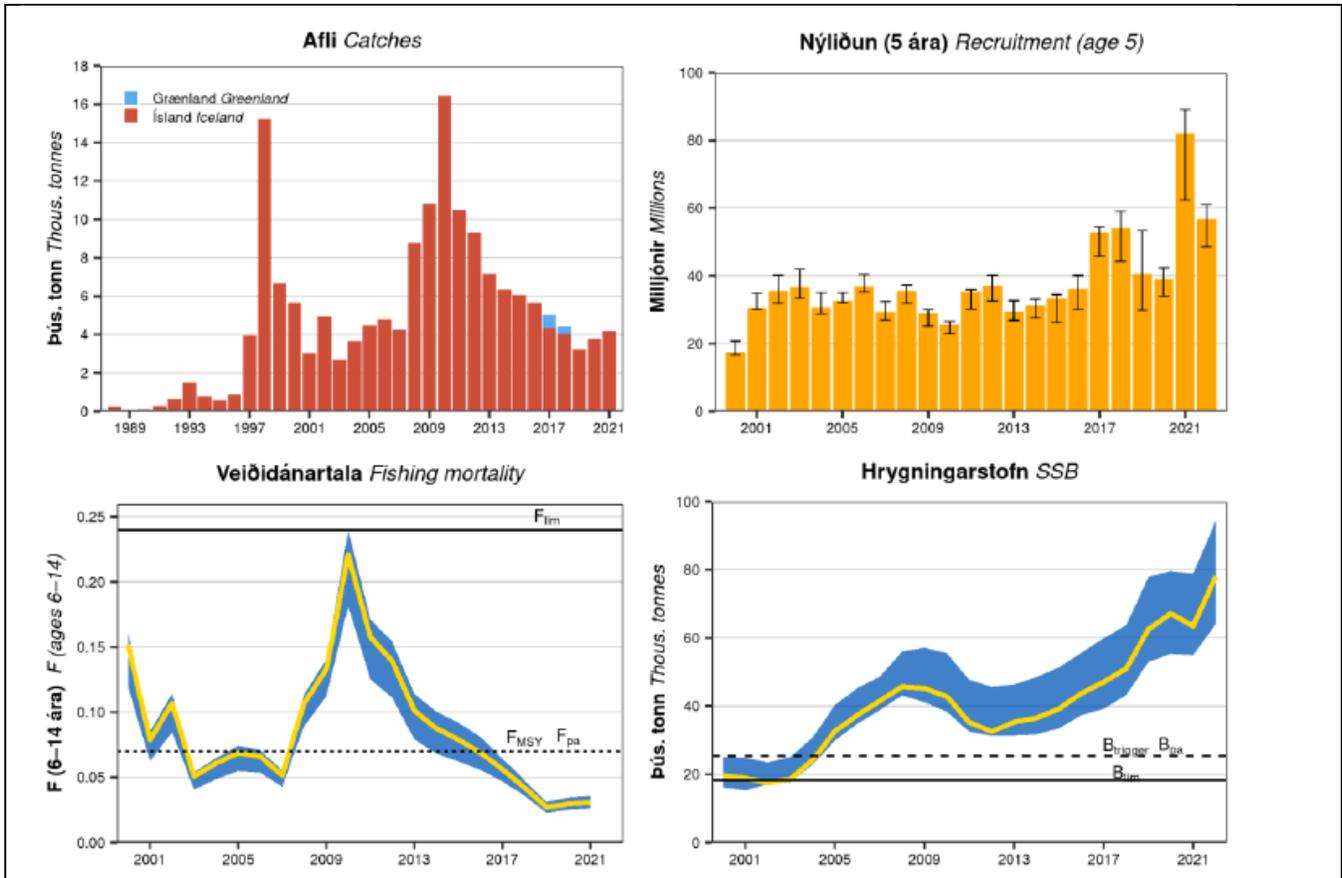


Figure 24. Greater silver smelt harvest rate and biomass.

SKARKOLI – PLAICE (*Pleuronectes platessa*)⁸¹

Fishing pressure on the stock is above FMGT but below Fpa and F_{lim}; spawning-stock is above MGT Btrigger and Blim.

⁸¹ <https://www.hafogvatn.is/static/extras/images/09-plaice1325992.pdf>

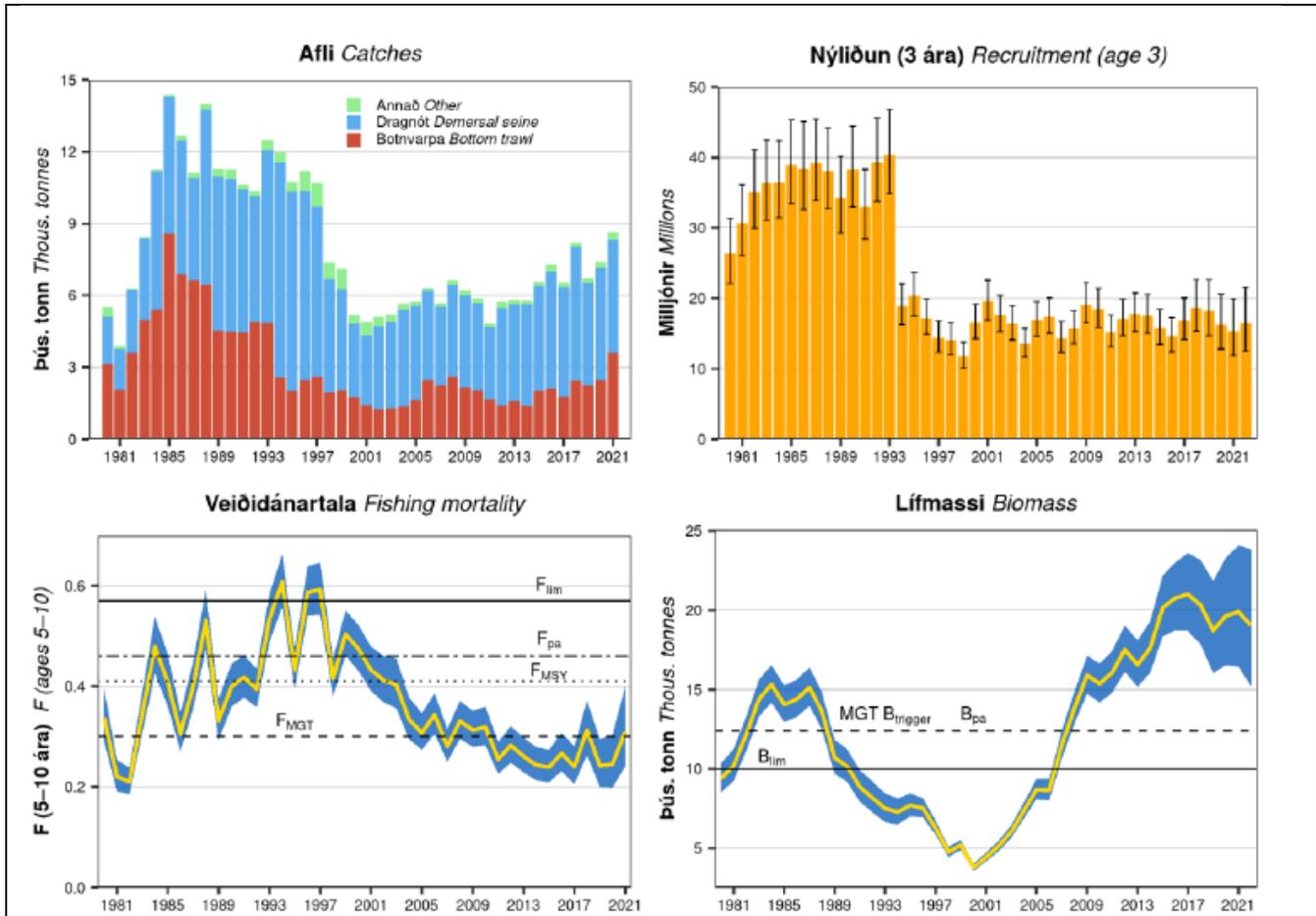


Figure 25. Plaiice harvest rate and biomass.

HUMAR – NORWAY LOBSTER (*Nephrops norvegicus*)⁸²

MFRI advised in 2019-2021 that effort on the Norway lobster should be decreased substantially because of the poor state of the stock. MFRI also advised that monitoring of the fishery should be allowed if the abundance index (number of burrows) was above half of the value at the beginning of the time series (in 2016) or 300 million burrows. Monitoring fishery was allowed for sampling and mapping the distribution of the stock. However, even though effort has decreased substantially in recent years, current data indicates that the state of the stock has declined and there is little or no incoming recruitment. The abundance index has decreased by 27% from 2016-2021 and is now at its lowest level. Burrow density in 2021 was estimated to be 0.066 burrows/m² which is one of the lowest values reported for other functional units of Norway lobster assessed by ICES. Data from catches and surveys indicate that there is very little incoming recruitment. At the same time the harvest rate has declined from 1.9% in 2016 to 0.2% in 2021 and CPUE in 2021 is the lowest value since 1970. For these reasons, the basis for the advice is changed and the recommendation now is that there should be zero catches in 2022 and 2023. Since 2014/15 catches have been within advice and within the National TAC. The harvest rate is now nominal (i.e. 0.2%). In 2019-2021, MFRI advised several closures for Norway lobster fishing and bottom trawling for fish on three Norway lobster grounds. MFRI advises that the same closures should be in effect in 2022 and 2023.

⁸² https://www.hafogvatn.is/static/extras/images/040-humar_desember_20211292276.pdf

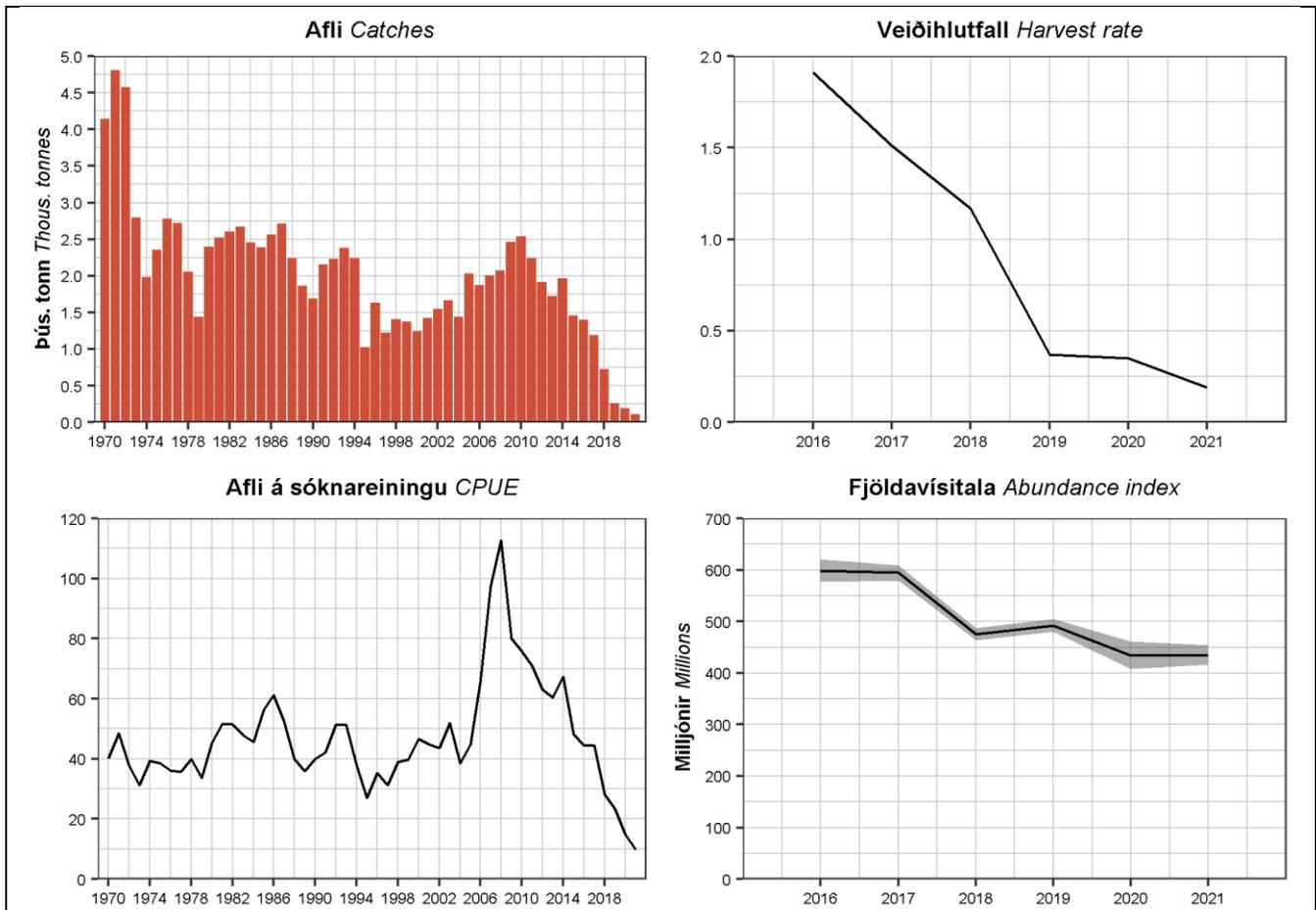


Figure 26. Norway lobster harvest rate and biomass.

ÞYKKVALÚRA – LEMON SOLE (*Microstomus kitt*)⁸³

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 Fprox point.

⁸³ <https://www.hafogvatn.is/static/extras/images/10-lemonsole1325996.pdf>

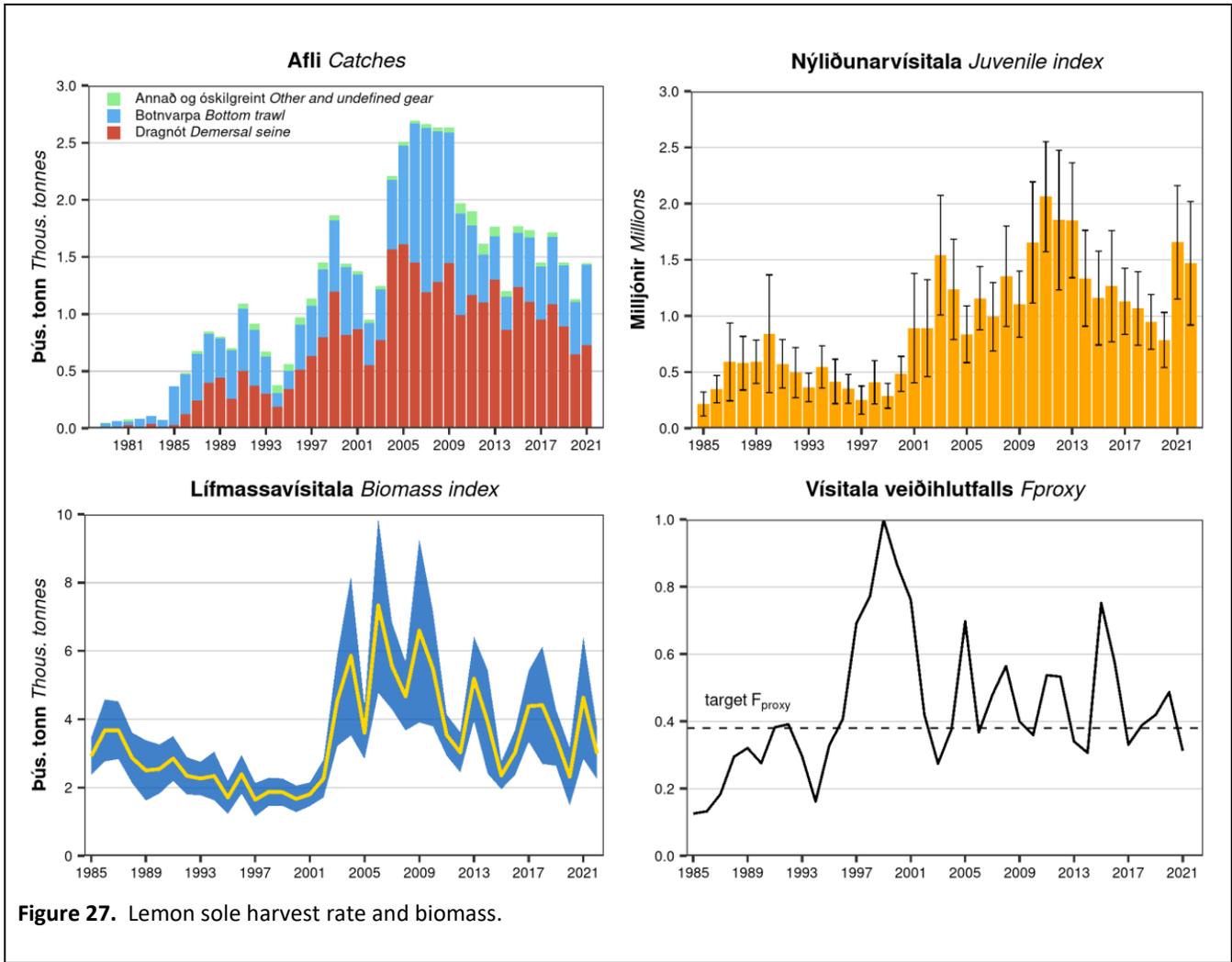


Figure 27. Lemon sole harvest rate and biomass.

LANGLÚRA – WITCH (*Glyptocephalus cynoglossus*)⁸⁴

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.

⁸⁴ <https://www.hafogvatn.is/static/extras/images/11-witch1326076.pdf>

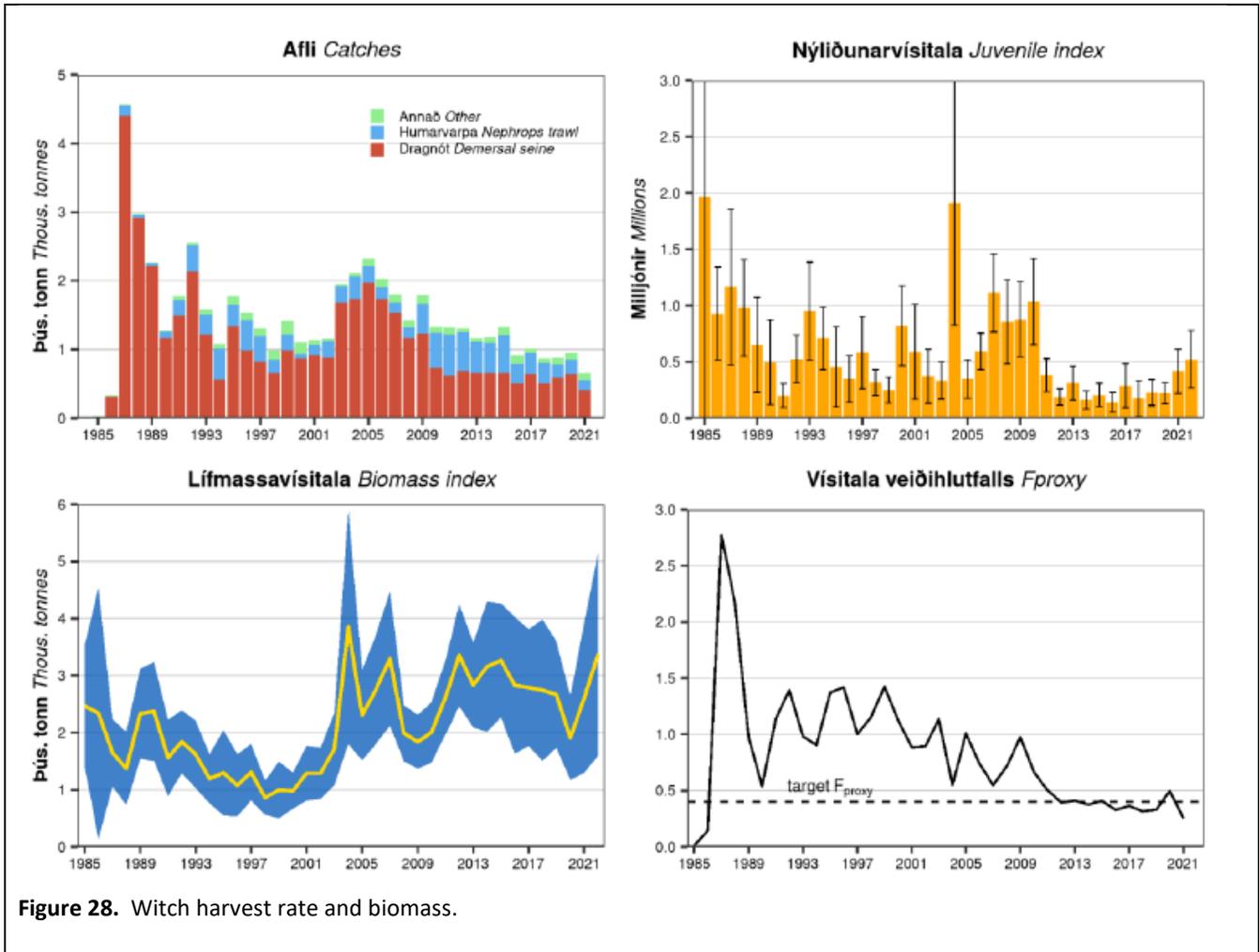


Figure 28. Witch harvest rate and biomass.

KEILA – TUSK (*Brosme brosme*)⁸⁵

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

⁸⁵ <https://www.hafogvatn.is/static/extras/images/19-tusk1326034.pdf>

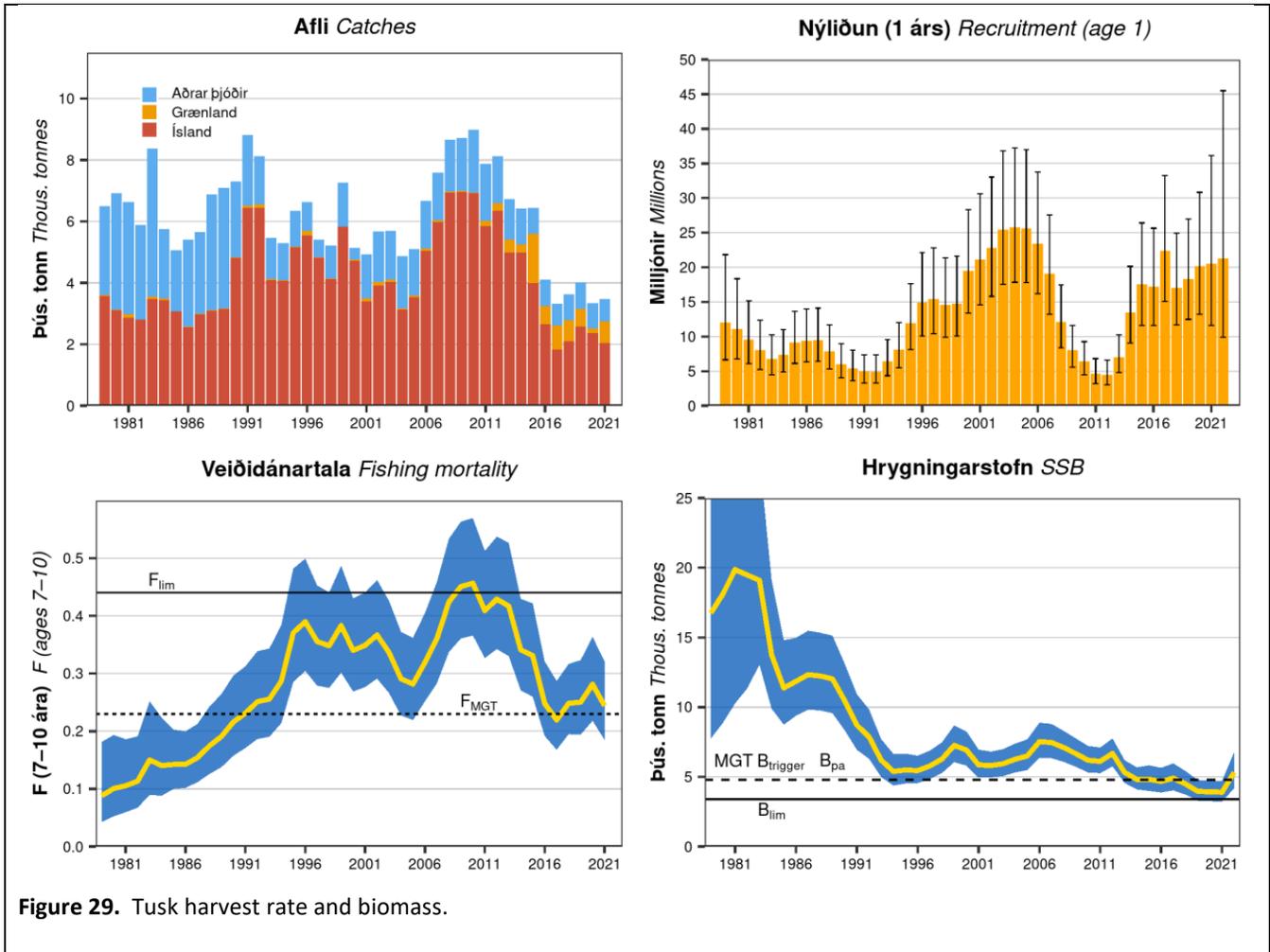


Figure 29. Tusk harvest rate and biomass.

SKÖTUSELUR – ANGLERFISH (*Lophius piscatorius*)⁸⁶

The biomass index was high in 2005–2011 compared to previous years but has since then decreased substantially. Juvenile indices show strong recruitment for year classes 1998–2007, but poor recruitment after this period. Fproxy was stable when the stock peaked but has decreased in recent years. Catches since 2013/14 have been on average within advice and National TAC.

⁸⁶ <https://www.hafogvatn.is/static/extras/images/20-anglerfish1326038.pdf>

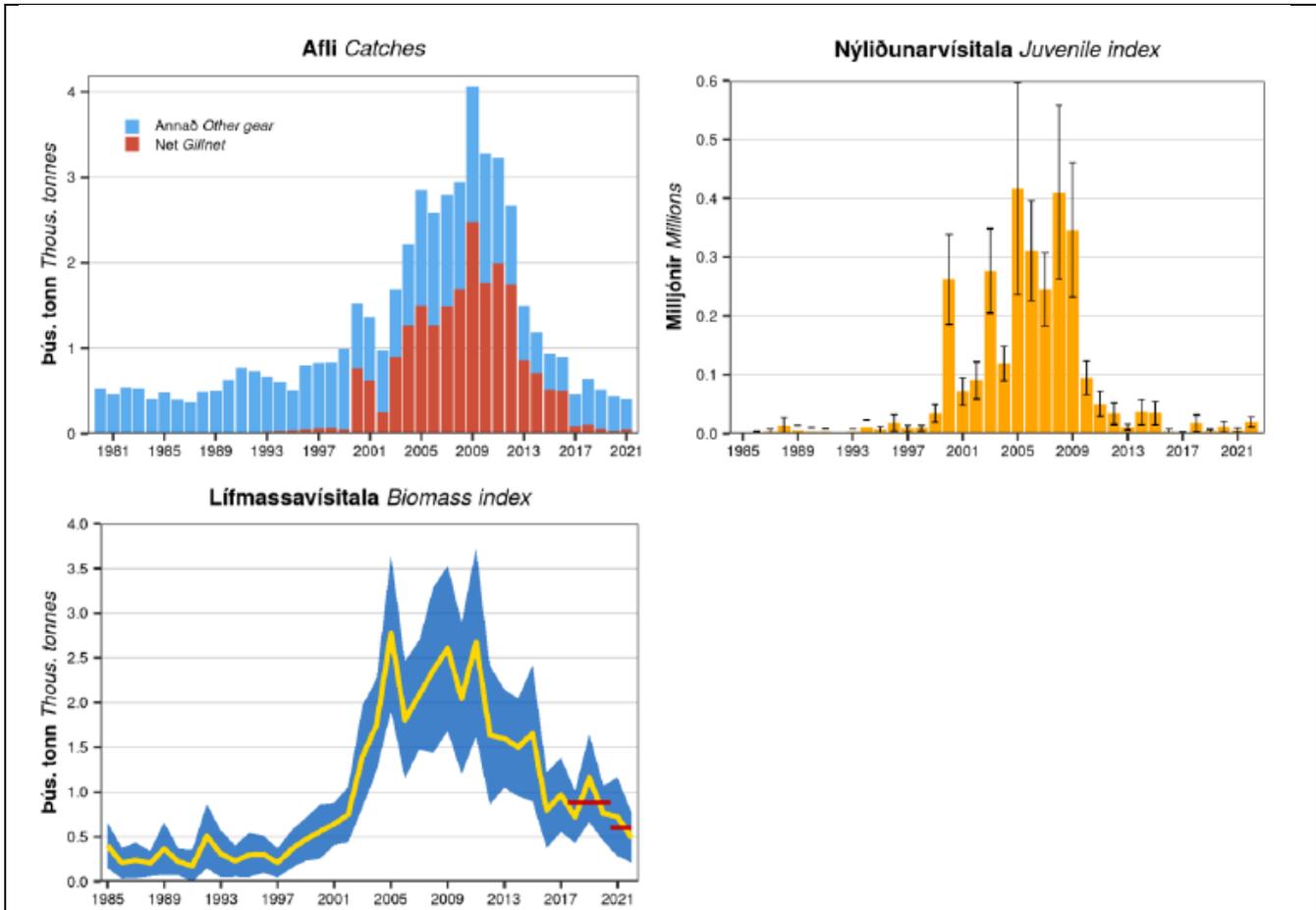
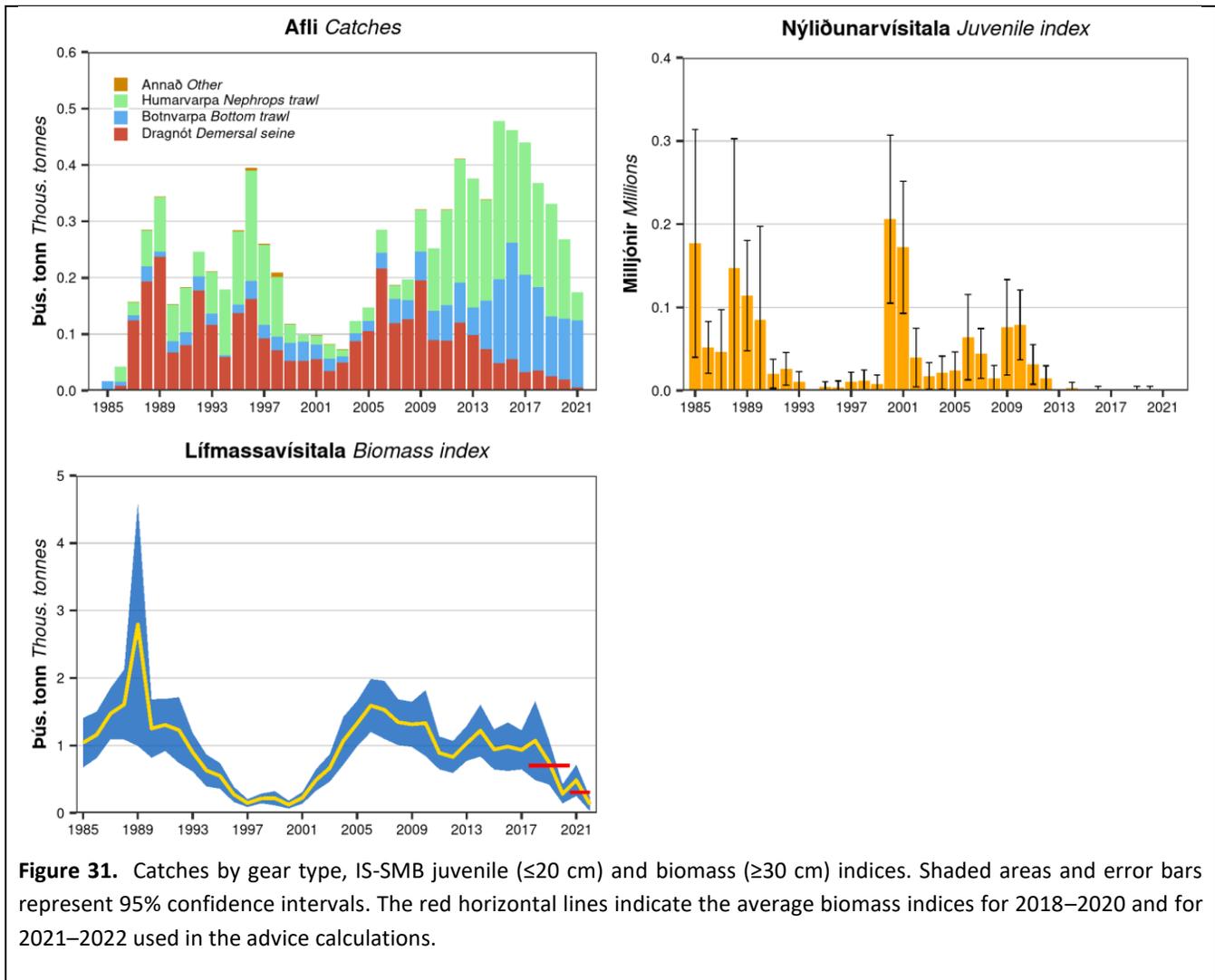


Figure 30. Anglerfish harvest rate and biomass.

STÓRKJAFTA –MEGRIM (*Lepidorhombus whiffiagonis*)⁸⁷

IS-SMB juvenile index declined rapidly between 1989 and 1994. It stayed low until 1999, after which it increased and remained high until 2012. Since 2013 the juvenile index has remained very low. The biomass index has for the most part followed the fluctuations in the recruitment index. It remained stable in 2006-2018 but in the past two years the biomass index has declined and has not been lower since 2001. Megrim is only caught as a bycatch and usually in small quantities (average of around 400 tonnes a year in the past decade). In 2020, approximately 52% of landed megrim was fished in Nephrops trawl with the rest caught in other gears. In 2021, approximately 70% of landed megrim was fished in bottom trawl and 25% in Nephrops trawl. To ensure stock conservation, the MFRI has recommended a TAC for megrim starting 2021/2022 fishing year. The TAC for 2022/2023 is 132 tonnes.

⁸⁷ <https://www.hafogvatn.is/static/extras/images/12-megrim1326006.pdf>



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

Context to the ling fishery. Some of the updates below are only partially relevant to the ling fishery because although (cod) gillnets are responsible for the majority of issues relating to seabird and marine mammal bycatch, ling catches from gillnet gear in the past 5 years have generally been limited, at around 6% of total gillnet catches. However, bycatch updates from longline (main gear) and trawl gear (second most important gear for ling) are certainly more relevant to the ling fishery.

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) report⁸⁸. From the ICES

⁸⁸ 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

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 report⁸⁹ 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>).

Harbour Porpoises (*Phocoena phocoena*)

Harbour porpoises are classified as Least Concern in the IUCN Red List⁹⁰ (population trend unknown, last assessed in 2020). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)⁹¹. 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 2009–2013⁹² 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.⁹³

The 2019 Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise (19-22 March 2019)⁹⁴ 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.

⁸⁹ ICES (2022): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.21602322.v1>

⁹⁰ <https://www.iucnredlist.org/species/17027/50369903>

⁹¹ <https://www.ni.is/node/27406>

⁹² 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>

⁹³ 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

⁹⁴ 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

In 2022 the same group provided the following update⁹⁵:" 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 seals⁹⁶ 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.

⁹⁵ 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

⁹⁶ <https://www.hafogvatn.is/static/extras/images/radgjof-landselur20201286028.pdf>

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

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

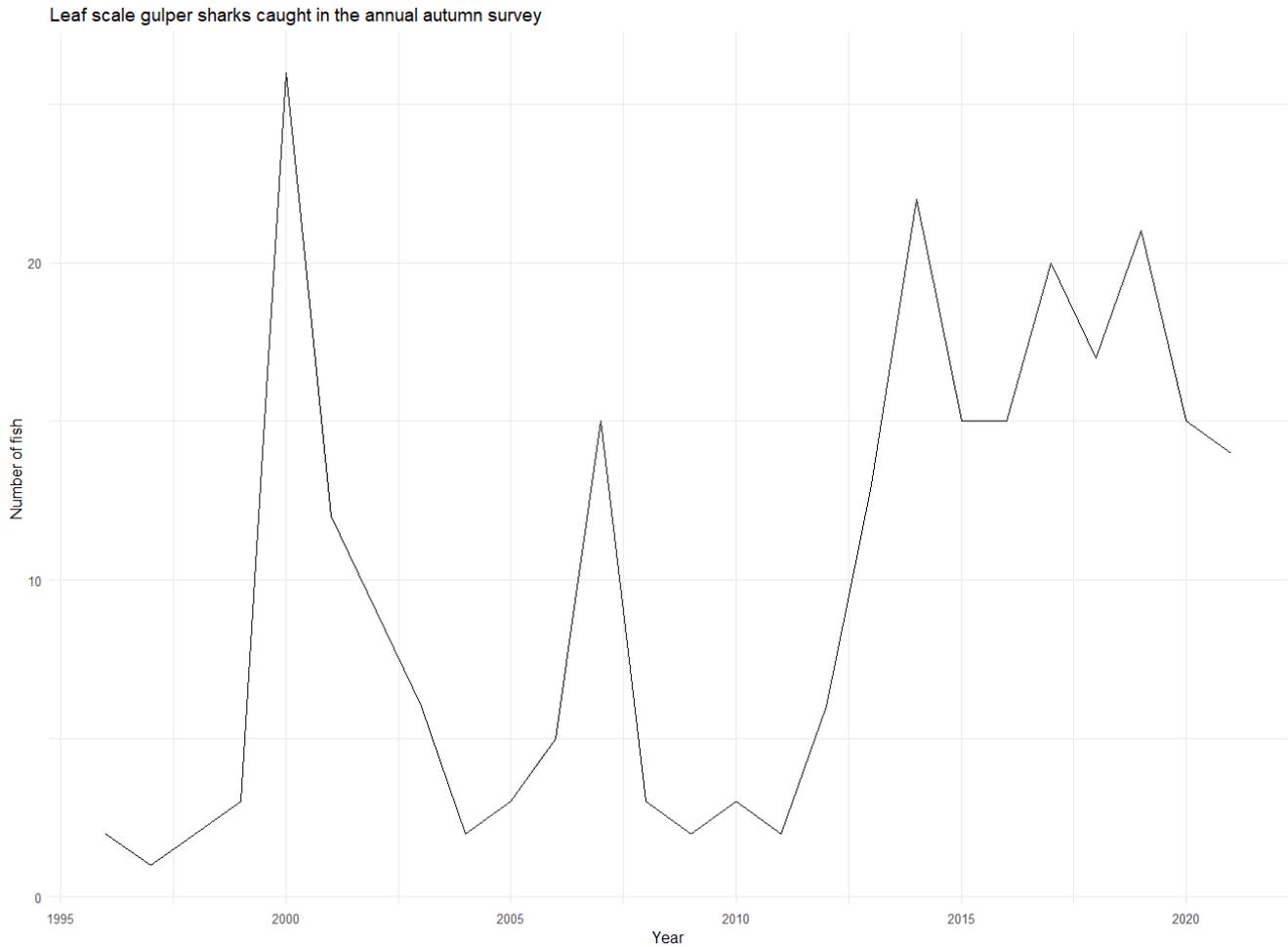


Figure 32. Leaf scale gulper shark caught in the annual autumn survey, from 1996 to 2022.

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.

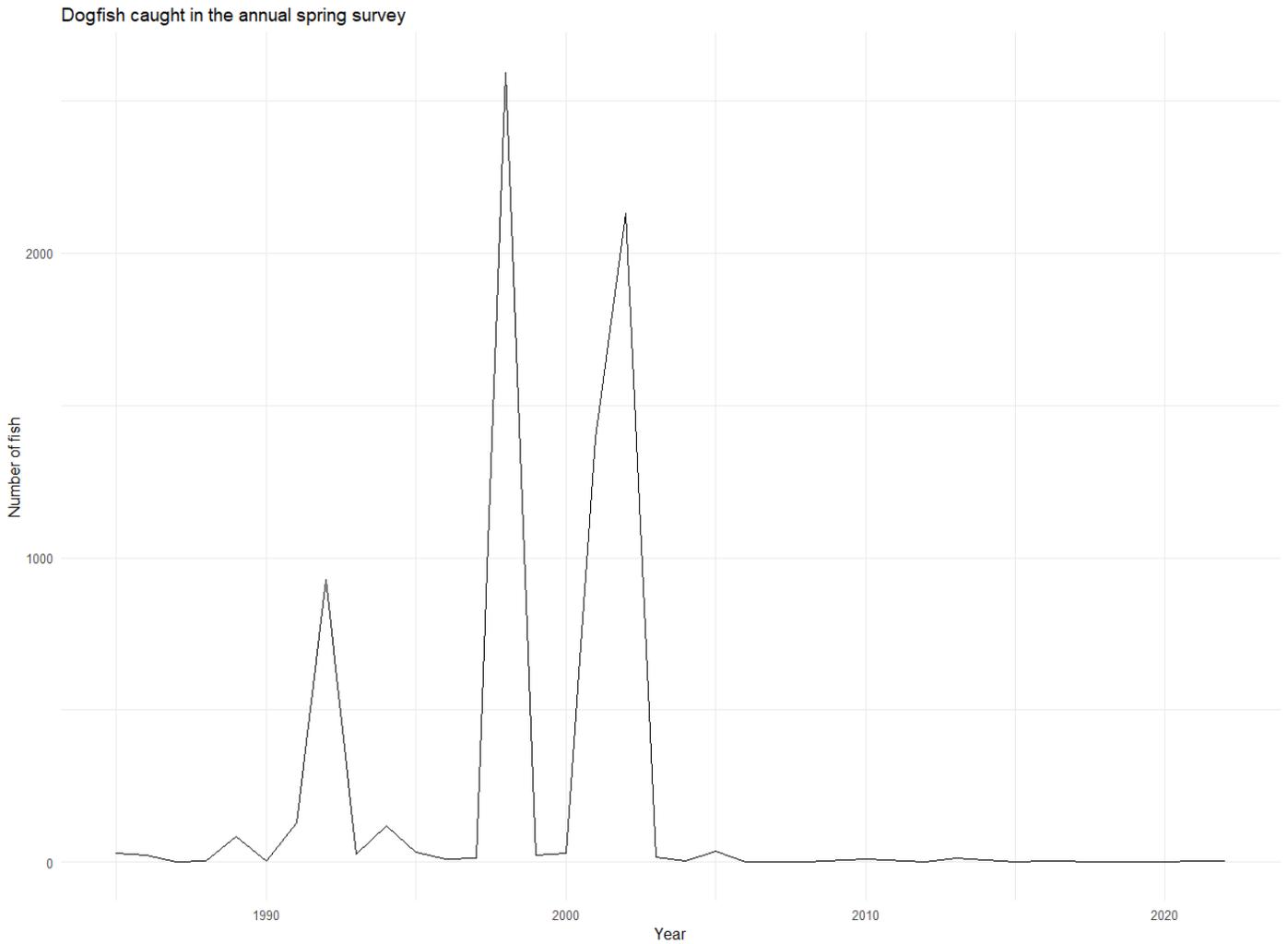


Figure 33. Dogfish caught in the annual spring survey, 1985 to 2022.

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

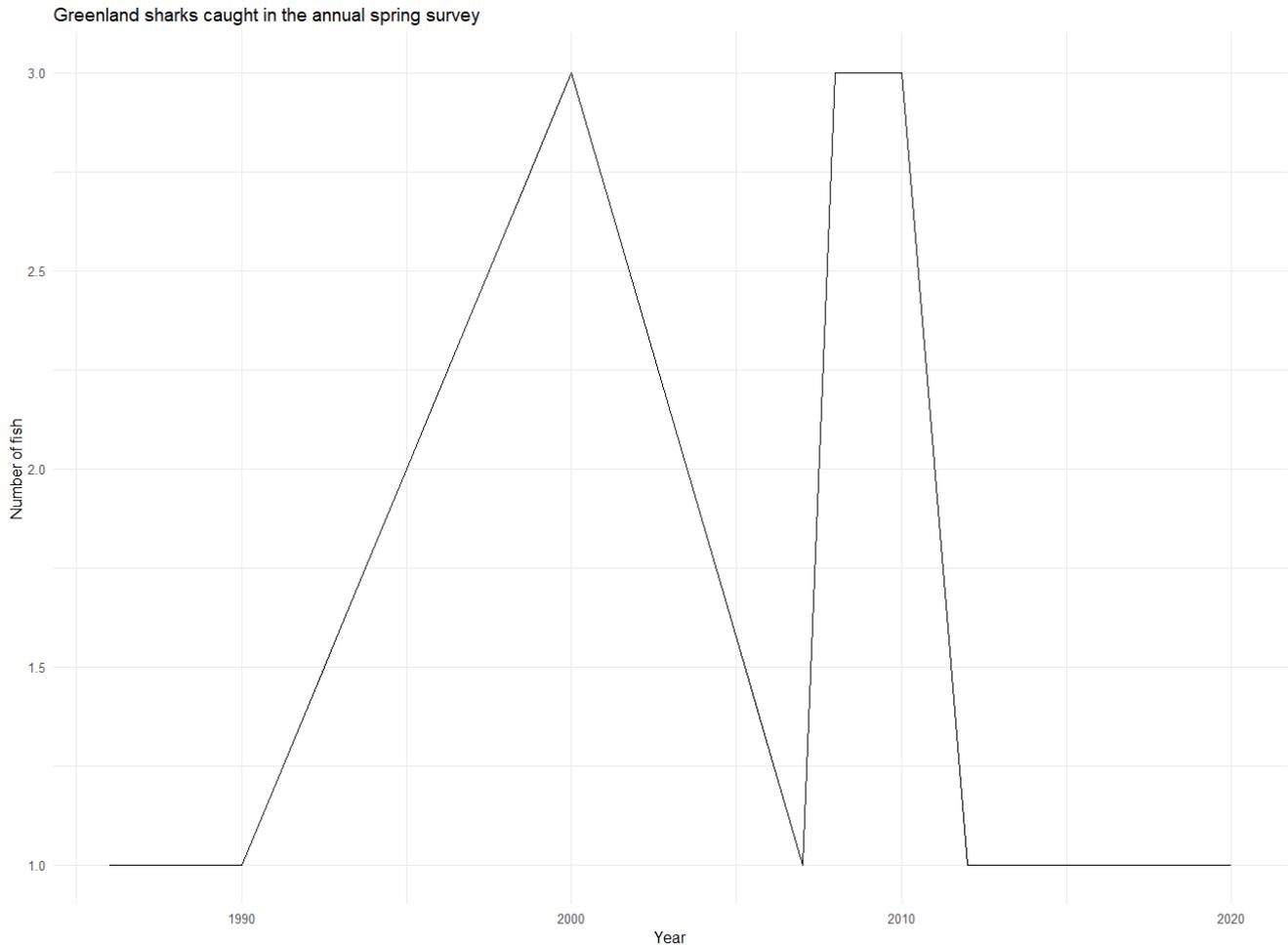


Figure 34. Greenland shark caught in the annual spring survey.

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.

6.5.1.1 Habitat

Trawl effort spatial extent

The ICES 2022 Icelandic ecosystem overview report⁹⁷ 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

⁹⁷ 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).⁹⁸

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.

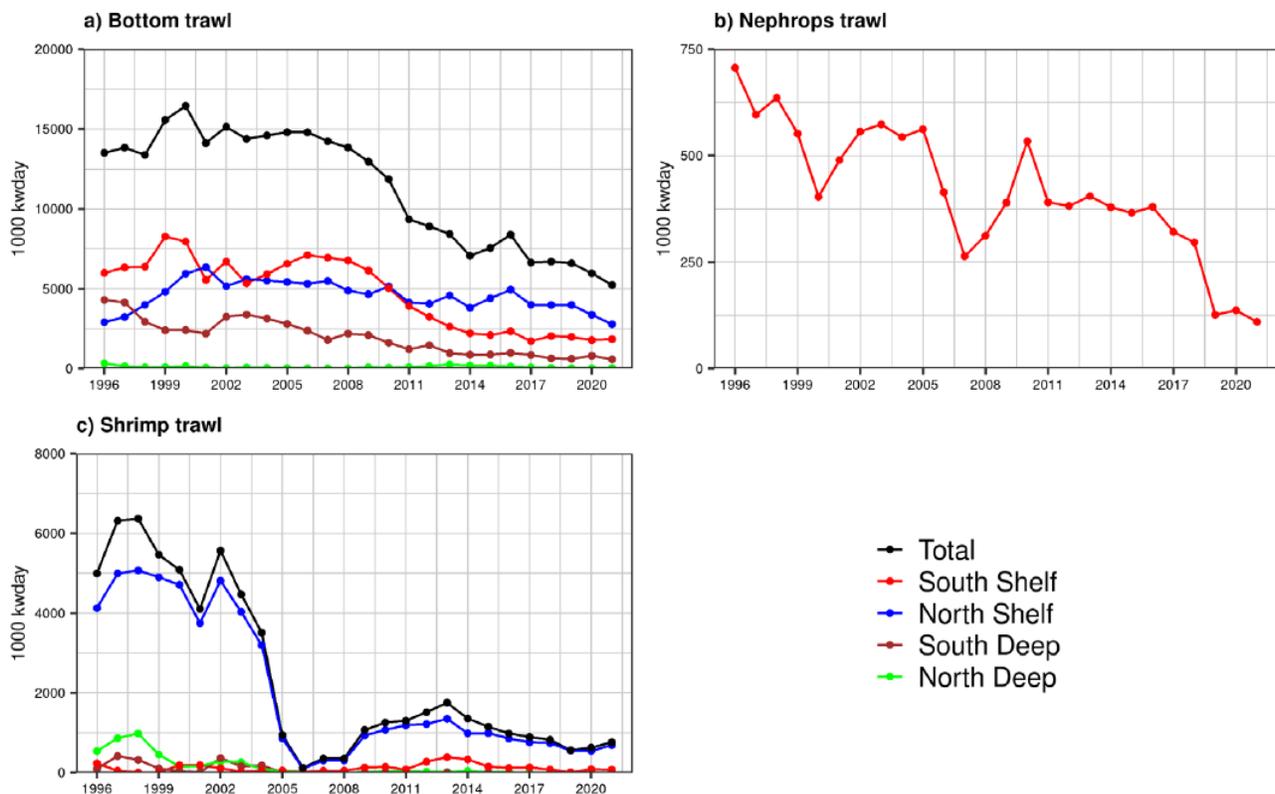


Figure 35. Annual total bottom-trawl fishing effort (1000 kW day) based on logbooks from trawl fishery targeting (a) fish, (b) Norway lobster, and (c) shrimp in the whole Icelandic Waters ecoregion between 1996 and 2021.

⁹⁸ <https://www.hafogvatn.is/static/research/files/hv2021-50.pdf>

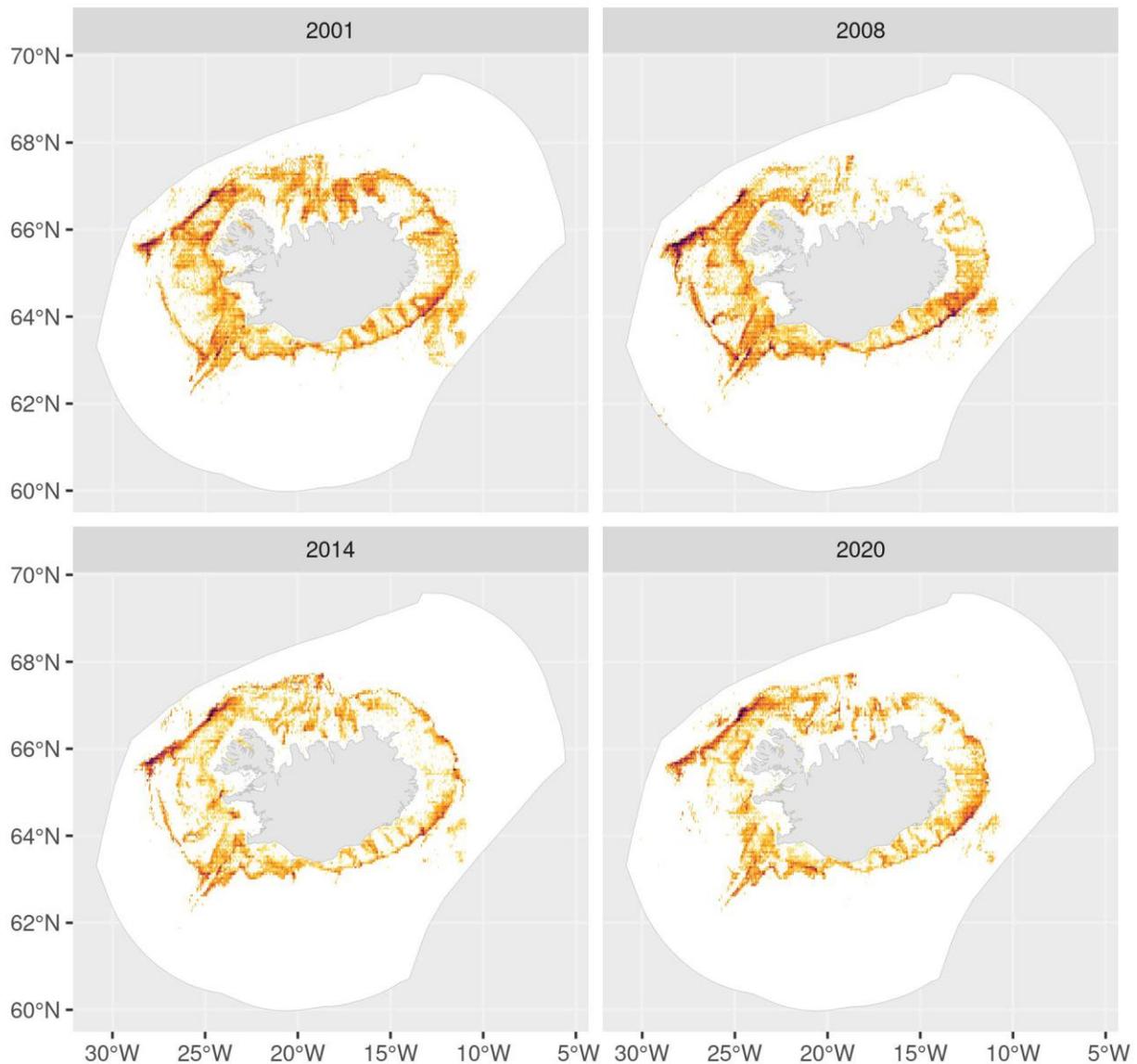


Figure 36. Spatial distribution of bottom-trawl effort (1000 kW hr) based on logbooks from trawl fishery targeting demersal fish, shrimp, and Norway lobster in 2000, 2008, 2014, and 2020.

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.

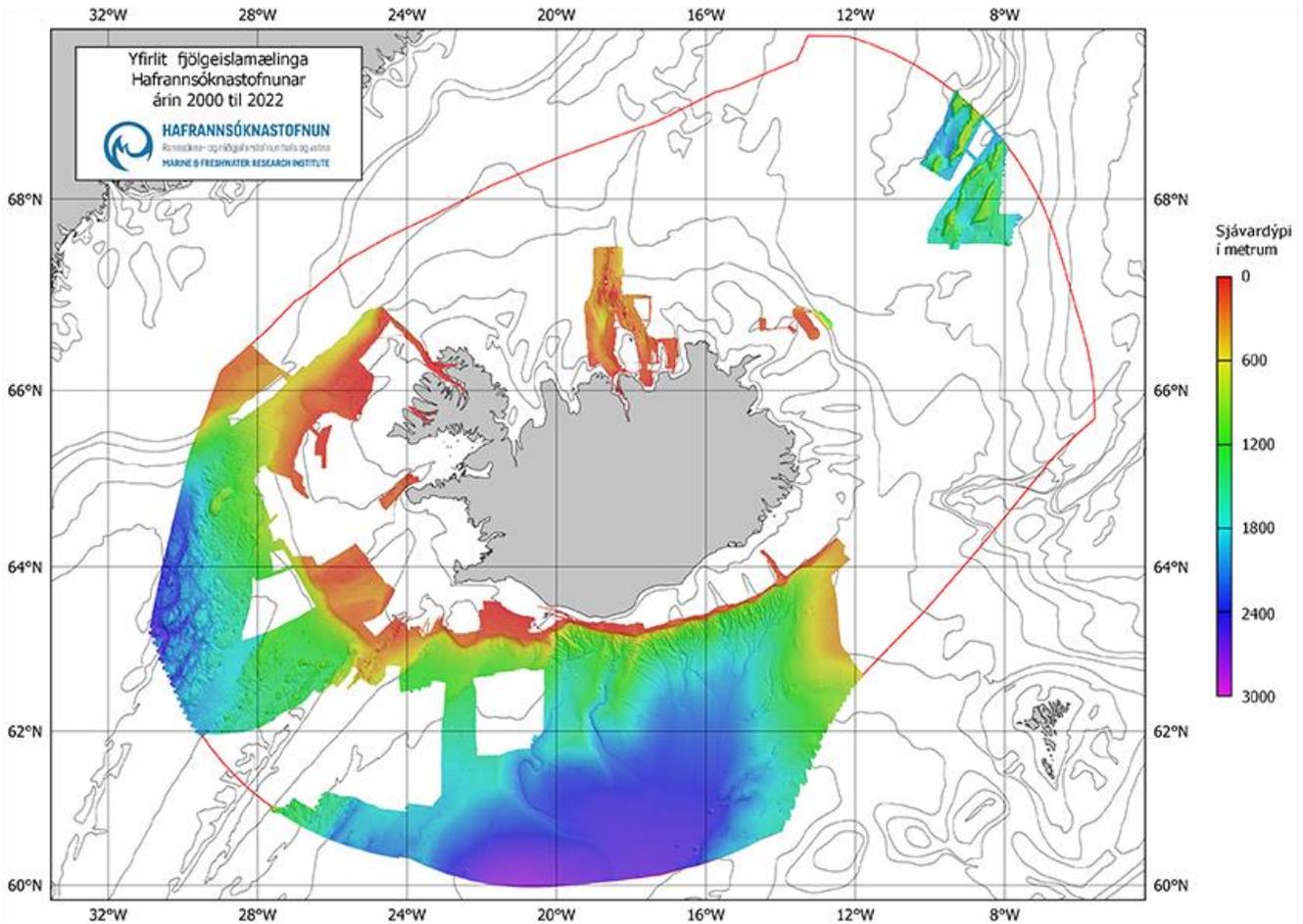


Figure 37. MFRI overview of seabed mapping in Icelandic waters between 2000 and 2022. Source: <https://www.hafogvatn.is/en/research/seabed-mapping>.

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)⁹⁹. 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.

⁹⁹ <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)¹⁰⁰. 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. 2020¹⁰¹) (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.

¹⁰⁰ <https://www.frontiersin.org/articles/10.3389/fmars.2020.00131/full>

¹⁰¹ 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>

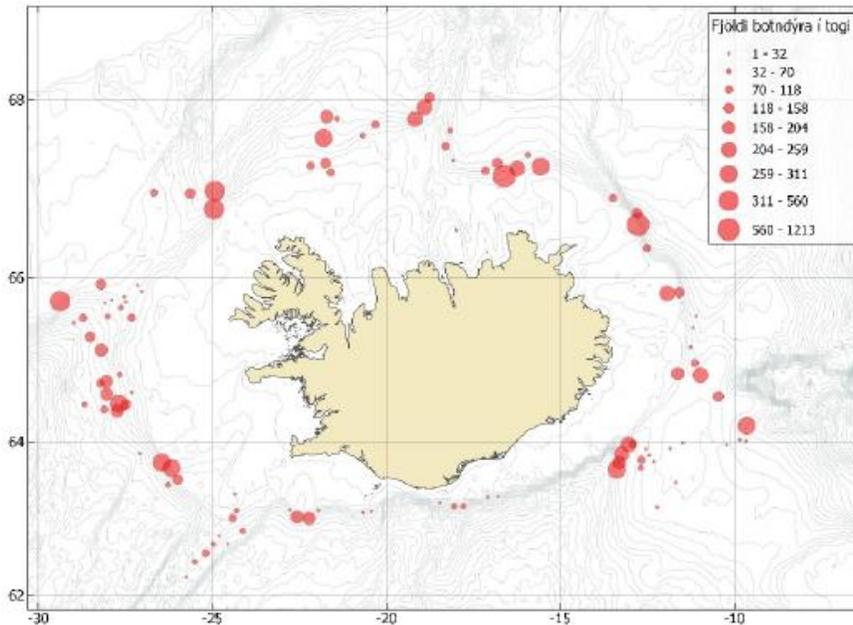


Figure 38. Benthos recorded in the autumn Icelandic autumn groundfish survey in 2020. Number (kg) per tow.

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. 2021¹⁰². 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).

¹⁰² 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.

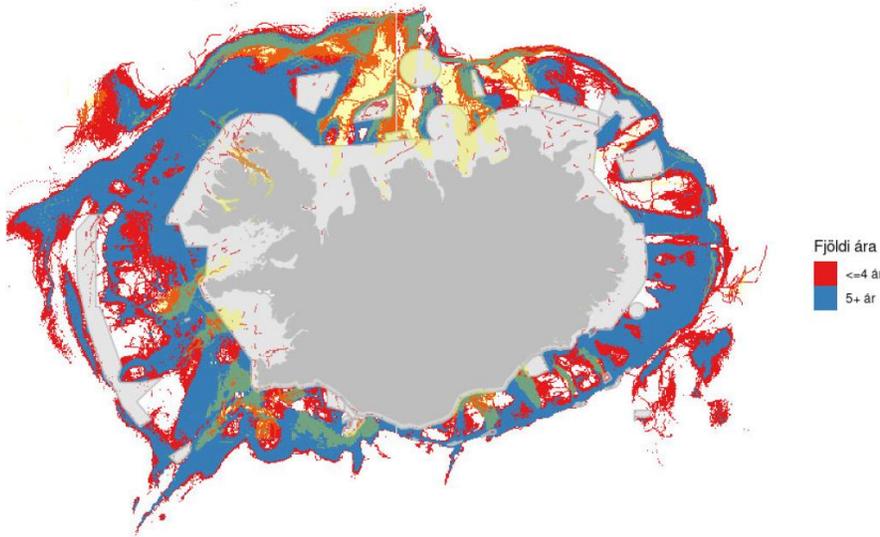


Figure 39. Long term closures and selected fishing distribution around Iceland between 2009-2019.

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.

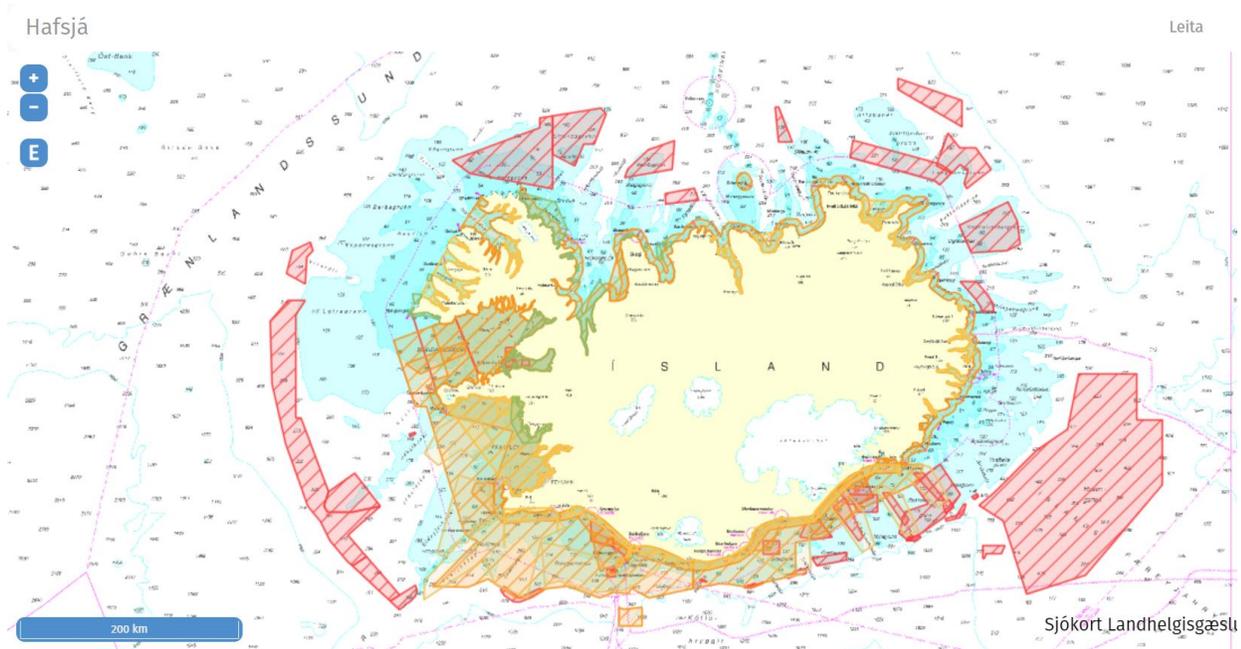


Figure 40. Regulatory long-term closures in Iceland, all gear types. Red closures tend to be bottom trawl and sometime all gear closures. Yellow/orange boxes with internal lines near the coast (East, West and North West) are longline closures. Open yellow/orange boxes south and southeast of Iceland are 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>.

6.5.1.2 Foodweb considerations

Ling feed on smaller fish such as herring, flatfishes, and other codfishes, as well as benthic invertebrates. Ling are in turn predated upon by marine mammals; however, they do not represent a key prey species in Icelandic food webs.

For the current fishery there are no further updates in terms of foodweb considerations aside from the data from Sturludottir *et. al.* 2018¹⁰³ which described the results of an ecological end-to-end model built using the Atlantic framework for the Icelandic marine ecosystem, and in which Icelandic common ling (likely grouped within the classes FOC=Other codfish, FDC=Demersal commercial or FDF=other demersal fish) was found to be reasonably well connected to other key fish species as both prey and predator, and as such did not appear to be a key prey species in the Icelandic marine ecosystem, like capelin for example.

¹⁰³ <https://www.sciencedirect.com/science/article/pii/S0165783618301620>

6.6 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

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

| | |
|---|--|
| 1.1 | Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls including: <ul style="list-style-type: none"> – The fisheries management system – The fisheries management plan |
| Summary of relevant changes: | <p>Overview</p> <p>The fisheries management consists of a network of organisations and agencies with a legal basis in terms of a suite of laws and regulations. The Ministry of Industries and Innovation has the ultimate responsibility, the Directorate of Fisheries is the executive body, the Coast Guard does control and surveillance and the MFRI is the scientific institution that provides advice to the Ministry. Internationally, ICES 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 marked or selling and buying quotas as needed. For most stocks, including ling, quotas can be transferred between years and between species, within certain bounds.</p> <p>The management plan includes the measures noted above. It has a harvest rule for deriving the total quota from a stock assessment. The plan includes reference points for biomass and exploitation rate. Such plans are generally developed by Iceland, mostly by the MFRI, and evaluated and endorsed by ICES.</p> |
| References: | Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document. |
| Statement of continuing consistency to the IRF Fishery Standard | The fishery continues to remain consistent with the standard. |

6.6.2 Clause 1.2 Research and Assessment

| | |
|------------------------------|---|
| 1.2 | Research and Assessment |
| Summary of relevant changes: | Ling is regarded as a local Icelandic stock and assessed as such. The assessment method was revised in 2022. The method changed from Gadget, which is length based, to SAM, which is an age-based state space model. It uses catches in numbers at age and survey indices at age and biological data from the spring and autumn bottom trawl surveys as well as a gillnet |

1.2 Research and Assessment

survey in the spring. The total amounts landed is provided the Directorate according to the landings reported by landing sites. There is a well-organized system for sampling of catches.

The assessment method was established and approved by ICES in a benchmark process in 2022. The SAM assessment tool was preferred over Gadget, that was used previously, because of better performance, in particular less retrospective error (Figure below). Also, it is simpler and less work-consuming to use. Gadget fitted directly to length distributions, which was problematic, while SAM fits to age distributions after conversion of length to age.

The large-scale trends in the new assessment are in line with previous estimates, with a marked peak in SSB around 2015 following a peak in the recruitment, and a gradual reduction in fishing mortality.

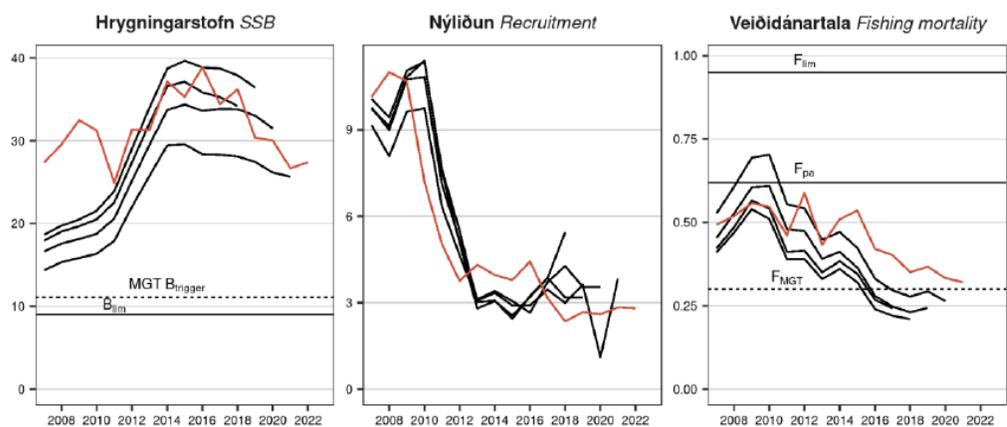


Figure 41. Main results of 2021 assessment, including historic retrospective deviations (From the MFRI advice on ling in 2022)¹⁰⁴.

Changes since last year

The assessment method changed in 2022 after a benchmark process that also included a revision of the management plan. The results are in line with previous results in gross terms.

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.

¹⁰⁴ <https://www.hafogvatn.is/static/extras/images/17-ling1326025.pdf>

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

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

Summary of relevant changes: The precautionary approach is implemented by applying a revised harvest rule with a target fishing mortality of 0.30, which is well inside the range defined by precautionary reference points. These reference points, that are tabulated in the Table below, were also revised in accordance with the revised assessment method established in 2022 and adopted by Icelandic authorities. The lowest observed SSB (9000 t in 1993, as estimated in 2022) was taken as B_{lim} , and B_{pa} was set at the upper 95-percentile of B_{lim} , assuming a $\sigma = 0.212$. The fishing mortality reference points were derived by simulations approved by ICES. According to these simulations, the fishing mortality leading to maximum long-term yield (F_{MSY}) is 0.30. $F_{lim} = 0.95$ was set at the fishing mortality with 50% probability of SSB and the precautionary $F_{pa} = 0.62$ was set at the highest fishing mortality associated with a risk <5% of falling below B_{lim} .

Table 11. Precautionary and management reference points.

| Framework | Reference point | Value | Technical basis |
|------------------------|-------------------|--------|---|
| MSY Approach | $MSY B_{trigger}$ | 11 100 | B_{pa} |
| | F_{MSY} | 0.30 | F that produces MSY in the long term |
| Precautionary Approach | B_{lim} | 9000 | B_{loss} (SSB in 1993) |
| | B_{pa} | 11 100 | $B_{lim} \times e^{1.645 \cdot \sigma B}$ |
| | F_{lim} | 0.95 | Fishing mortality that in stochastic equilibrium will result in median SSB at B_{lim} . |
| | F_{pa} | 0.62 | Maximum F at which the probability of SSB falling below B_{lim} is <5% |
| Management plan | $MGT B_{trigger}$ | 11 100 | According to the harvest control rule |
| | F_{MGT} | 0.30 | According to the harvest control rule |

Management targets. The management plan has a target fishing mortality of 0.30, which leads close to the maximum long-term yield. The relatively low fishing mortality reduces the risk caused by uncertain assessment with only minor loss of long-term average catch. In line with ICES technical guidelines the $MSY B_{trigger}$ is set as B_{pa} . The rule is to reduce the F linearly towards the origin for SSB below $MSY B_{trigger} = 11100$ t. As the harvest strategy is to constrain the exploitation rate (F), and this F is associated with a low risk of recruitment overfishing, a separate biomass target is considered redundant and has not been defined.

Harvest rule. The TAC set using the ICES advice rule with a fishing mortality $F_{MGT} = 0.30$ applied to ages 8–11, modified by the ratio $SSB_y / MGT B_{trigger}$ when $SSB_y < MGT B_{trigger}$. The expected range of realized fishing mortalities (F) following the management plan (F_{MGT}) is between 0.21 and 0.44.

| | |
|---|---|
| 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) |
| | <p>Further protective measures include area closures and rules for landing of undersized fish. Closed areas can be permanent, which are defined in regulations and remain unchanged from year to year, as well as temporary closures (normally for 3 weeks) of areas where undersized fish are caught. Undersized ling has not led to closures in recent years.</p> <p>The management of temporary closures was moved from MFRI to the Directorate last year.</p> <p>Changes since last year. The management plan and the reference points were changed this year after a change in assessment method. These changes are mostly technical and do not lead to major changes in performance or management strategy.</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. |

6.6.4 Clause 1.4 External Scientific Review

| | |
|---|--|
| 1.4 | External Scientific Review |
| Summary of relevant changes: | ICES ¹⁰⁵ 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 and the management plan for ling were evaluated and approved in 2022. ¹⁰⁶ |
| 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. |

6.6.5 Clause 1.5 Advice and Decisions on TAC

| | |
|------------------------------|--|
| 1.5 | Advice and Decisions on TAC |
| Summary of relevant changes: | Stock assessment and advice, including advice on harvest rules, TACs and reference points is provided by ICES. The process involves all relevant nations and the advice is for all areas. The advice is published on the MFRI website once it is ready ¹⁰⁷ . Normally, the MFRI advice follows the ICES advice. The Minister of Fisheries and Agriculture decides on the TAC of the ling stock for each fishing year (Sept –Aug) in accordance to law (Fisheries Management Act |

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

106 https://ices-library.figshare.com/articles/report/Iceland_request_for_evaluation_of_a_harvest_control_rule_for_ling_in_Icelandic_waters/19625736

107 <https://www.hafogvatn.is/static/extras/images/17-ling1326025.pdf>

| | |
|---|--|
| 1.5 Advice and Decisions on TAC | |
| | <p>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.</p> <p>The Icelandic ling stock is a local stock confined to Icelandic waters, and is managed by Iceland alone.</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. |

Section 2. Compliance and Monitoring

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

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

Summary of relevant changes: The Icelandic Directorate of Fisheries, or Fiskistofa¹⁰⁸, 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.

The Icelandic Coast Guard¹⁰⁹ is responsible for control at sea, both of the catches and the quality of the vessels. It performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters, and monitoring of fishing within the zone in consultation with the Marine and Freshwater Research Institute and Ministry of Industries and Innovation. The Coast Guard operates the Icelandic Maritime Traffic Service within its operations centre which has a key role in ensuring safety at sea, but can also take action if the behaviour of a fishing vessels is unusual.

The 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 1996¹¹⁰). Provisions of the Act on a Special Fee for Illegal Marine Catch¹¹¹ 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).

Summary of relevant updates in 2022

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.

Table 12. 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 |

¹⁰⁸ <https://www.fiskistofa.is/umfiskistofu/>

¹⁰⁹ <http://www.lhg.is/english>

¹¹⁰ <https://www.althingi.is/lagas/149a/1996057.html>

¹¹¹ <https://www.althingi.is/lagas/149a/1992037.html>

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

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| 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 13. Fiskistofa suspected violations in 2020 and 2021. Source: Fiskistofa 2020¹¹² and 2021 Annual Report¹¹³. 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 |
| Framhjálöndun / 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 / Lump sucker fishing | 13 | 2 |

¹¹² https://www.fiskistofa.is/media/arsskyrslur/Arsskyrsla_Fiskistofu_2020.pdf

¹¹³ <https://www.fiskistofa.is/media/arsskyrslur/arsskyrsla-2021.pdf>

2.1 Implementation, Compliance, Monitoring, Surveillance and Control

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| 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 |

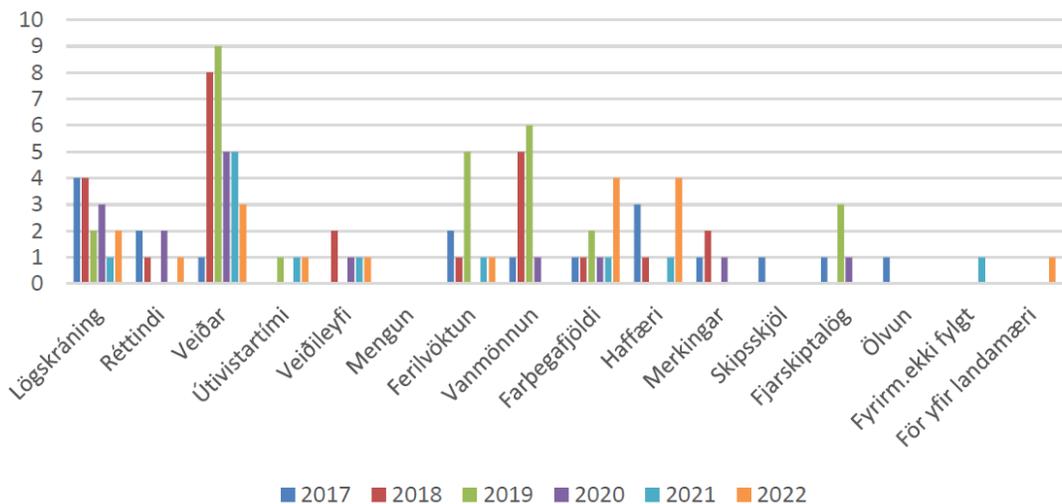
Enforcement by the Icelandic Coast Guard

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)



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| 2.1 Implementation, Compliance, Monitoring, Surveillance and Control | |
| | <p>Figure 42. 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. |

6.6.7 Clause 2.2 Concordance between actual Catch and allowable Catch

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| 2.2 Concordance between actual Catch and allowable Catch | |
| Summary of relevant changes: | <p>Context</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.746/2016¹¹⁴. These must be electronic (e-logs). Small vessels used to use paper logbooks until late 2020 when regulation 298/2020¹¹⁵ implemented the use of an electronic app. The App also called Afladagbókina or catch diary^{116 117} 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. |

¹¹⁴ <https://www.stjornartidindi.is/Advert.aspx?RecordID=42a16a67-60a7-4ae7-ad7c-0f53fc254654>

¹¹⁵ <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹¹⁶ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

¹¹⁷ 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

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)⁵⁷.

2022 updates

The Minister of Fisheries and Agriculture decides on the TAC of the ling stock for each fishing year (Sept –Aug) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned below. Before catch is allocated, proportions of the TAC of some species is removed for various reasons such as for the coastal fisheries which any small boat in possession of a licence may access, for research purposes or for chartered angling vessels. 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 expected catch by other nations (Faroes and Norway) has not been taken into account when setting the National TAC. The actual catch has deviated from the TAC, up to about 15% in both directions. In addition to catches by foreign nations, a likely cause is the flexibility that is permitted. The deviations is to a large extent due to transfers between years, and also between species (Figure below). A ling quota can be used to cover catches of other species (negative transfers) or quotas of other species can be used to cover catches of ling (positive transfers).

Table 14. Recommended TAC, quotas and reported catches for Icelandic ling.

| Fiskveiðíár <i>Fishing year</i> | Tillaga <i>Recommended TAC</i> | Aflamark <i>National TAC</i> | Afli Íslendinga <i>Catches Iceland</i> | Afli annarra þjóða <i>Catches other</i> | Afli alls <i>Total catch</i> |
|------------------------------------|-----------------------------------|---------------------------------|---|--|---------------------------------|
| 2010/2011 | 7 500 | 7 500 | 9 327 | 768 | 10 095 |
| 2011/2012 | 8 800 | 9 000 | 10 074 | 1 059 | 11 133 |
| 2012/2013 | 12 000 | 12 000 | 11 196 | 1 249 | 12 445 |
| 2013/2014 | 14 000 | 14 000 | 11 794 | 1 188 | 12 982 |
| 2014/2015 | 14 300 | 14 300 | 11 684 | 1 974 | 13 658 |
| 2015/2016 | 16 200 | 16 200 | 9 773 | 1 456 | 11 229 |
| 2016/2017 | 9 343 | 9 343 | 7 291 | 1 135 | 8 426 |
| 2017/2018 | 8 598 ¹⁾ | 8 598 | 7 017 | 1 309 | 8 326 |
| 2018/2019 | 6 255 ¹⁾ | 6 255 | 6 927 | 1 101 | 8 028 |
| 2019/2020 | 6 599 ¹⁾ | 6 599 | 5 972 | 1 183 | 7 155 |
| 2020/2021 | 5 700 ¹⁾ | 5 700 | 6 201 | 1 013 | 7 214 |
| 2021/2022 | 4 735 ¹⁾ | 4 735 | | | |
| 2022/2023 | 6 098 ²⁾ | | | | |

¹⁾ 18 % aflaregla – 18% harvest control rule

²⁾ Aflaregla byggð á ICES ráðgjafarreglu með $F_{MGT} = 0.30$ – Harvest control rule based on ICES advice rule ($F_{MGT} = 0.30$)

2.2 Concordance between actual Catch and allowable Catch

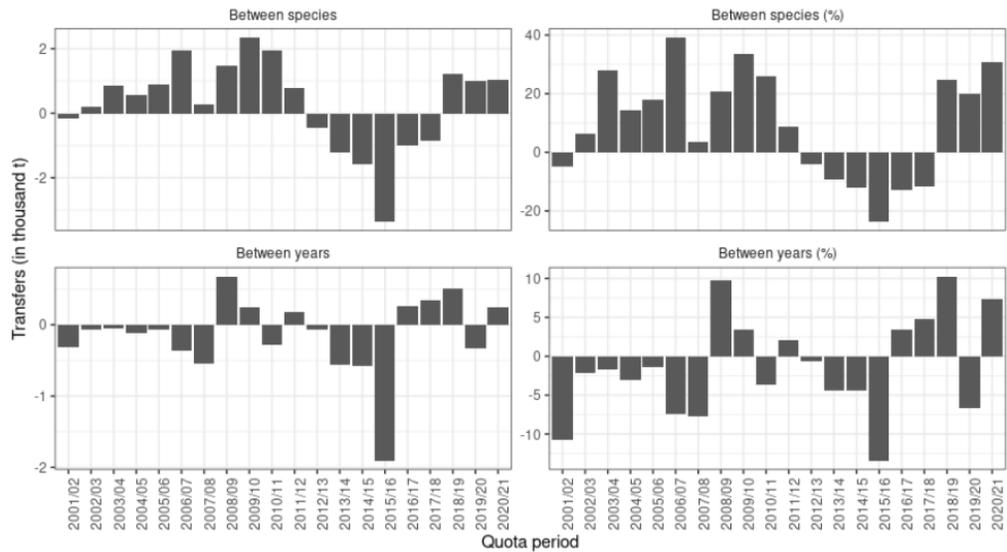


Figure 43. Net transfer of quota to and from ling in the Icelandic ITQ system by fishing year. Between species (upper): Positive values indicate a transfer of other species to ling, but negative values indicate a transfer of ling quota to other species. Between years (lower): Transfer of quota from given quota year to the next quota year.

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.

6.6.8 Clause 2.3 Monitoring and Control

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

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

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| <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>Catches by vessel are monitored and recorded in near real-time in a central database maintained by the Fisheries Directorate¹¹⁸. 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 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</p> |

¹¹⁸ <http://www.fiskistofa.is/veidar/aflaheimildir/aflahlutdeildalisti/>

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| <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>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 fines¹¹⁹.</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> <p>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.</p> |

¹¹⁹ <http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Vidurlog>

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| <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>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 298/2020¹²⁰. The App also called Afladagbókina or catch diary^{121 122} 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:</p> <p>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 site¹²³. 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>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 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> |
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¹²⁰ <https://www.reglugerid.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹²¹ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skrangu-afla>

¹²² <https://www.mbl.is/200milur/frettir/2020/08/31/oll-aflaskraning-rafraen-fra-og-med-morgundeginum/>

¹²³ <https://www.facebook.com/Fiskistofa-1151844504903713/videos/304666984614930/>

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| 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 |
| | 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. |
| References: | Please refer to the footnotes and references in the text above, the summary/background section and the Reference section at the end of this document. |
| Statement of continuing consistency to the IRF Fishery Standard | The fishery continues to remain consistent with the standard. |

Section 3. Ecosystem considerations

6.6.9 Clause 3.1 Guiding Principle

| 3.1 Guiding Principle | |
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| 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. A status update on each of these species identified during the ling full assessment¹²⁴ is provided in Table 10.</p> <p>Endangered, Threatened and Protected (ETP) and vulnerable species interactions</p> <p>Context to the ling fishery. Some of the updates below are only partially relevant to the ling fishery because although (cod) gillnets are responsible for the majority of issues relating to seabird and marine mammal bycatch, ling catches from gillnet gear in the past 5 years have generally been limited, at around 6% of total gillnet catches. However, bycatch updates from longline (main gear) and trawl gear (second most important gear for ling) are certainly more relevant to the ling fishery.</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) report¹²⁵. 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 report¹²⁶ 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>Cepphus 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> <p>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</p> |

¹²⁴ <https://www.responsiblefisheries.is/media/1/form-11.2-iceling-initial-assessment-final-report-and-determination-1.pdf>

¹²⁵ 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

¹²⁶ ICES (2022): Working Group on Bycatch of Protected Species (WGBYC). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.21602322.v1>

3.1 Guiding Principle

current certificate for this fishery (see relevant audit report at <https://www.responsiblefisheries.is/certification/certified-fisheries>).

Harbour Porpoises (*Phocoena phocoena*)

Harbour porpoises are classified as Least Concern in the IUCN Red List¹²⁷ (population trend unknown, last assessed in 2020). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)¹²⁸. 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 2009–2013¹²⁹ 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.¹³⁰

The 2019 Report of the NAMMCO Scientific Committee Working Group on Harbour Porpoise (19-22 March 2019)¹³¹ 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 update¹³²: "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.

¹²⁷ <https://www.iucnredlist.org/species/17027/50369903>

¹²⁸ <https://www.ni.is/node/27406>

¹²⁹ 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>

¹³⁰ 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

¹³¹ 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

¹³² 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

3.1 Guiding Principle

Sigurðsson 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 seals¹³³ 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.

¹³³ <https://www.hafogvatn.is/static/extras/images/radgjof-landselur20201286028.pdf>

3.1 Guiding Principle

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

The ICES 2022 Icelandic ecosystem overview report¹³⁴ 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).¹³⁵

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

Habitat mapping, NovasArc project

¹³⁴ 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>

¹³⁵ <https://www.hafogvatn.is/static/research/files/hv2021-50.pdf>

3.1 Guiding Principle

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)¹³⁶. These maps were also compared to the footprint of bottom fishing and the collision between them discussed. The project was a collaborative project of the Marine Research Institute with Havstovan in the Faroe Islands and the Institute of Marine Research in Bergen, supported by the Nordic Council of Ministers NORDEN.

The 2019 NovasArc report highlighted through a risk assessment method that within the Icelandic EEZ, overlap between the fishing effort and the optimal predicted habitat was high for several VMEs, including sublittoral sea pen communities (54.8% of their optimal habitat), hard bottom sponge aggregations (51.2%), stylasterid corals (50.5%), cold-water coral reefs (50.4%), soft bottom sponge aggregations (41.6%), and hard bottom gorgonians (42.3%). However, the authors also note that historical trawl disturbance may have decreased the amount of suitable habitat for these benthic groups.

Also, a paper was published by Burgos et. al (2020)¹³⁷ 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. 2020¹³⁸) (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

¹³⁶ <http://norden.diva-portal.org/smash/get/diva2:1304079/FULLTEXT02.pdf>

¹³⁷ <https://www.frontiersin.org/articles/10.3389/fmars.2020.00131/full>

¹³⁸ 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>

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| 3.1 Guiding Principle | <p>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).</p> <p>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.</p> <p>Foodweb considerations</p> <p>Ling feed on smaller fish such as herring, flatfishes, and other codfishes, as well as benthic invertebrates. Ling are in turn predated upon by marine mammals; however, they do not represent a key prey species in Icelandic food webs.</p> <p>For the current fishery there are no further updates in terms of foodweb considerations aside from the data from Sturludottir <i>et. al.</i> 2018¹³⁹ which described the results of an ecological end-to-end model built using the Atlantic framework for the Icelandic marine ecosystem, and in which Icelandic common ling (likely grouped within the classes FOC=Other codfish, FDC=Demersal commercial or FDF=other demersal fish) was found to be reasonably well connected to other key fish species as both prey and predator, and as such did not appear to be a key prey species in the Icelandic marine ecosystem, like capelin for example.</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. |

6.6.10 Clause 3.2 Specific Criteria

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| <p>3.2 Specific Criteria including:</p> <ul style="list-style-type: none"> 3.2.1 Information gathering and advice 3.2.2 By-catch and discards 3.2.3 Habitat Considerations 3.2.4 Foodweb Considerations 3.2.5 Precautionary Considerations | |
| Summary of relevant changes: | <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. 2021), which include results of routine monitoring and assessment efforts is available online at https://www.hafogvatn.is/en/harvesting-advice. The Directorate of 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</p> |

¹³⁹ <https://www.sciencedirect.com/science/article/pii/S0165783618301620>

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

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.¹⁴⁰

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

The status of bycatch and associated species has been detailed in the previous clause. 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).

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.

Key habitat considerations are listed in the yearly ICES ecosystem report for the Icelandic waters, the last of which was published in 2022¹⁴¹. 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.

Foodweb considerations can be gleaned from the data from Sturludottir *et. al.* 2018¹⁴² which described the results of an ecological end-to-end model built using the Atlantic framework for the

¹⁴⁰ <http://www.fiskistofa.is/veidar/aflastada/aflastodulisti/>

¹⁴¹ 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>

¹⁴² <https://www.sciencedirect.com/science/article/pii/S0165783618301620>

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| <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>Icelandic marine ecosystem, and in which Icelandic common ling (likely grouped within the classes FOC=Other codfish, FDC=Demersal commercial or FDF=other demersal fish) was found to be reasonably well connected to other key fish species as both prey and predator, and as such did not appear to be a key prey species in the Icelandic marine ecosystem, like capelin for example.</p> <p>Precautionary considerations are integrated in the management of associated and non- target species.</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.</p> |

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

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

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

During the full assessment audit¹⁴³ of this fishery in 2019 (first certification cycle), all clauses but one was found to be in full conformance. In this respect, one minor non-conformance was identified against clause 2.3.2.4 of the IRFM Standard (V2), relating to the appropriate recording of marine mammal and seabird bycatch data in fishing logbooks. Progress against the NC 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.

| Non-conformance 1 (of 1) | |
|-------------------------------|---|
| Clause: | 2.3.2.4. Catch amounts by species and fishing area shall be estimated and continually recorded in fishing logbooks on-board the fishing vessels |
| Non-conformance level: | Minor Non-conformance |
| Non-conformance: | Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks. |
| Rationale: | <p>The recording of marine mammals and seabirds by number and species is required by Icelandic regulation¹⁴⁴. 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> 2015¹⁴⁵ and the March 2018 MFRI report titled: “Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017”.</p> <p>Pallson <i>et al.</i> 2015 highlighted the fact that their bycatch estimates were based on limited data that needed to be increased and improved with a functioning reporting system for the fishery and better follow up.</p> |

¹⁴³ <https://www.responsiblefisheries.is/media/1/form-11.2-iceling-initial-assessment-final-report-and-determination-1.pdf>

¹⁴⁴ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967>

¹⁴⁵ <https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf>

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| | <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 2017¹⁴⁶.</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> |

¹⁴⁶ <https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf>



To whom it may concern

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Reykjavík February 15, 2019
Reference: ANR18030330/11.02.09

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

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

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

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

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

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

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

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

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

On behalf of the Minister of Fisheries and Agriculture



Brynhildur Benediktsdóttir

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

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

| | <p>Accordingly, the Ministry is now considering further action with a view to determine what arrangements are realistically achievable and by when, potentially resulting in the following corrective action timelines:</p> <p>Year 1: Ongoing work to further refine the actions identified above in terms of specific deliverables with their accompanying timeline; Year 2: Initiate deliverable x, y, z identified in Year 1; Year 3: Fully implement and report on progress; Year 4: Continued implementation and reporting.</p> | | | | | | | | | | | | | | | | | | |
|---|---|------------------------------------|------|------|-------|--|--|---------|------|------|------|------|-------|------------------|----|----|----|----|-----|
| <p>Assessment Team CAP response</p> | <p>The Assessment Team has accepted the Corrective Action Plan provided by the Client for the fishery under assessment.</p> | | | | | | | | | | | | | | | | | | |
| <p>Progress at year 1 - 1st Surveillance (early 2021)</p> | <p>During the 2021 remote audit, Fiskistofa confirmed that starting in September 2020 smaller Icelandic vessels (including gillnetters that are responsible for most of the recognised bycatch of marine mammals and seabirds) are now required to log their catches in an app (essentially a e-logbook) which contains information on catch and bycatch, including that of marine mammals and seabirds. This follows regulation 298/2020¹⁴⁷. The App was designed and trialled between 2018 and 2020. The App also called Afladagbókina or catch diary¹⁴⁸ automatically records the location of the boat during fishing and the captains then records the catch, its condition and by-catch, in a very simple way. The app replaces paper logbooks in the small boat sector, with an electronic catch recording system. It is expected that this app will make the recording of bycatch easier for the fleet.</p> <p>Additionally, the MFRI has provided the latest (available) reported bycatch from the fishing fleet by gear. They report that (as somewhat expected) logbook records were generally much lower than the estimated bycatch. As an example, the total bycatch of reported harbour porpoises in the gillnet fishery over the 4 years was 171 porpoises while the total observed by inspectors and in the MFRI cod gillnet survey (3.7% of total effort) was 119 porpoises (yearly).</p> <p>Bycatch of marine mammals and seabirds by gear type in 2016-2019 as reported by the fishing fleet. Source MFRI, January 2021.</p> <table border="1" data-bbox="381 1514 1219 1694"> <thead> <tr> <th colspan="6">Cod and Greenland halibut gillnets</th> </tr> <tr> <th>Species</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Harbour porpoise</td> <td>52</td> <td>45</td> <td>48</td> <td>26</td> <td>171</td> </tr> </tbody> </table> | Cod and Greenland halibut gillnets | | | | | | Species | 2016 | 2017 | 2018 | 2019 | Total | Harbour porpoise | 52 | 45 | 48 | 26 | 171 |
| Cod and Greenland halibut gillnets | | | | | | | | | | | | | | | | | | | |
| Species | 2016 | 2017 | 2018 | 2019 | Total | | | | | | | | | | | | | | |
| Harbour porpoise | 52 | 45 | 48 | 26 | 171 | | | | | | | | | | | | | | |

¹⁴⁷ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21887>

¹⁴⁸ <http://www.fiskistofa.is/umfiskistofu/frettir/afladagbokin-smaforrit-fyrir-rafraena-skraningu-afla>

¹⁴⁹ https://www.mbl.is/200milur/frettir/2020/08/31/oll_aflaskraning_rafraen_fra_og_med_morgundeginum/

| | | | | | |
|-----------------------------|-----------|------------|------------|------------|-------------|
| 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 |

| | | | | | | | |
|--|--|-----------------------|----------|----------|----------|----------|----------|
| | <table border="1"> <tr> <td>Total seabirds</td> <td>0</td> <td>0</td> <td>0</td> <td>3</td> <td>3</td> </tr> </table> | Total seabirds | 0 | 0 | 0 | 3 | 3 |
| Total seabirds | 0 | 0 | 0 | 3 | 3 | | |
| Assessment Team Determination on 1st Surveillance (early 2021) Corrective Evidence | <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> <p>The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 1 and 2. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 2nd surveillance activities will review evidence that the corrective actions highlighted above have been carried out.</p> | | | | | | |
| Year 2 progress (2nd Surveillance, late 2021) | <p>As of November 2021, the App continues to be used in the small vessel sector and catch and bycatch data is being collected by Fiskistofa and the MFRI for management purposes. MFRI staff reported that data from the App is in the process of being made available to the MFRI through MFRI/Fiskistofa IT staff collaboration, although timelines for completion are unclear as of November 2021. Fiskistofa has also reported as part of this 2nd surveillance audit that since the beginning of the App's implementation it has been mandatory to register all catch and bycatch according to regulation 298/2020 and the data is being received by the authorities. Their inspectors have been busy training fishermen and captains at the quaysides during landing, and their helpline was quite busy in the beginning of the coastal fleet season. Also, one physical meeting was held in Akranes with coastal fishermen. A tutorial video on the use of the App was also published on the Fiskistofa website https://www.fiskistofa.is/ymsaruppl/tilkynningar/afladagbocarapp-myndband and on the Fiskistofa Facebook site¹⁵⁰.</p> <p>Furthermore, a traceability component to the App has been implemented in April 2021 which is been used to further help with the detection of discrepancies in catch records and to allow better traceability across the supply chain. This traceability component is currently subject to further development.</p> | | | | | | |
| Assessment Team Determination on Year-2 Corrective Evidence | <p>The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 2. The non-conformance remains open and on track towards appropriate closure.</p> <p>The 3rd surveillance activities will review evidence of continuous implementation of the App in the small vessel sector.</p> | | | | | | |
| Year 3 progress (3rd) | <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,</p> | | | | | | |

¹⁵⁰ <https://www.facebook.com/Fiskistofa-1151844504903713/videos/304666984614930/>

| | |
|--|--|
| Surveillance, late 2022) | <p>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> |
| Assessment Team Determination on Year-3 Corrective Evidence | <p>Status in late 2022. Progress is deemed to be behind schedule and a revised corrective action has been requested from the Client.</p> |

7.1.1 New non-conformances

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

7.1.2 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
Rannsóknar- og ráðgjafarstofnun hafs og vatna
MARINE & FRESHWATER RESEARCH INSTITUTE



DIRECTORATE OF FISHERIES

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fiskistofa.is

Akureyri 15 February 2023

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.

7.1.3 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 1) | |
|----------------------------------|---|
| Clause: | 3.1.1 and 3.1.2 |
| Recommendation: | Several fisheries management plans 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 ¹⁵¹) and sea-pen fields ¹⁵² . 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. |

8 Recommendations for continued certification

8.1 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.

8.2 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.

¹⁵¹ http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/Ecosystem_overview-Icelandic_Waters_ecoregion.pdf

¹⁵² <https://novasarc.hafogvatn.is/project/>

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11 Appendices

11.1 Appendix 1 – 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.