# Iceland Responsible Fisheries (IRF) Certification Programme

## Re-assessment Report

***For The***

# Icelandic *Cod (Gadus morhua)* Commercial Fisheries

***Facilitated By***

**Iceland Responsible Fisheries Foundation (IRFF)**


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ICELAND RESPONSIBLE FISHERIES
CERTIFIED

## Glossary

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

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

  

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# 1. Summary and Recommendations

The Fisheries Association of Iceland on behalf of the Federation of Icelandic Fishing Vessel Owners (LÍÚ), the Federation of Icelandic Fish Processing Plants (SF) and the National Association of Small Boat Owners, Iceland (NASBO) requested an assessment of the Icelandic Iceland cod (*Gadus morhua*) commercial fishery to the FAO Based Icelandic Responsible Fisheries Management (IRF) Certification Programme. The original Certification was granted on October 7th, 2014. The certificate was extended to February 10th, 2020. As part of this second re-assessment, the current clients for this fishery are Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland) and Landssamband smábátaeigenda (The National Association of Small Boat Owners, Iceland (NASBO)).

The purpose of the Programme is to provide the fishing industry with a "Certification of Responsible Fisheries Management" at the highest level of market acceptance. Certification to the Programme demonstrates a commitment that will communicate to customers and consumers the responsibility of fishermen and fisheries management authorities and the provenance of Icelandic fish. The Iceland Responsible Fisheries Foundation (IRFF), established in February 2011, owns and operates the brand of Iceland Responsible Fisheries (IRF).

The Certification Programme is accredited to the international standard ISO/IEC 17065, confirming that consistent, competent and independent certification practices are applied. Formal ISO/IEC 17065 accreditation by an IAF (International Accreditation Forum) Accreditation body gives the Programme formal recognition (since September 2014) and a credibility position in the international marketplace and ensures that products certified under the Programme are identified at a recognised level of assurance. Demonstration of compliance is verified through a rigorous assessment by a competent, third party, accredited certification body, SAI Global. The assessment was conducted by a team of SAI Global appointed Assessors comprising of internal staff and externally contracted fishery experts. Details of the assessment team are provided in Appendix 1. The Peer Reviewers were Dr. Lisa Borges, Dr. Geir Hønneland and Deirdre Hoare. Details of the Peer Review Team are provided in Appendix 2.

The unit of certification includes the Icelandic cod *(Gadus morhua)* commercial fisheries, under state management by the Icelandic Ministry of Industries and Innovation, fished directly with demersal trawls, long-lines, Danish seine nets, gill nets, and hook and line by small vessels, and indirectly with Nephrops trawls, shrimp trawls, pelagic trawls and purse seines within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ).

This is the 2019 Re-Assessment Report of the Icelandic cod commercial fishery. It comprises a full assessment of the fishery against the requirements of the current IRF standard, to evaluate whether current practices in the management of the Icelandic cod commercial fishery remain consistent with criteria contained in the IRF Standard. The assessment was conducted according to the Global Trust procedures for FAO-Based IRFM certification using Revision 2.0 of the Icelandic Responsible Fisheries Management (IRFM) Standard (July 2016)[1].

The key outcomes of this Assessment have been summarized in Section 5. Assessment Outcome Summary and Recommendations of the Assessment Team.

[1] https://www.responsiblefisheries.is/media/1/irfm-standard-revision-2.0-final-2.pdf

  

### 1.1.1. Conformance against the IRFF Standard V2

During this re-assessment audit all clauses but two were found to be in full conformance. One minor non-conformance was identified (during the 4th surveillance in 2018/19) 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. A new minor non-conformance was identified during this re-assessment against clause 3.1.1 relative to the bycatch of spotted wolfish and common loon. Corrective Action Evidence and Plans for the two minor Non Conformances are available under the Non Conformances and Corrective Actions section. The Assessment Team has also issued a number of formal Recommendations for the Client Group to consider.

**Recommendation #1 (relating to clause 1.5.8).** The Assessment Team recommends that the issue of TAC overshooting (due to flexibility measures in Iceland) is addressed at the next management plan revision in 2020/2021 and that the harvest control rule is evaluated through simulation by addressing the implementation bias in the order of magnitude experienced in recent years.

**Recommendation #2 (relating to clause 3.1.1).** The Assessment Team recommends that Grey skate (Dipturus spp.), a Critically Endangered Species listed in the IUCN Red list, are afforded more explicit/directed management measures to ensure that the current bycatch levels resulting from longline, bottom trawl and Danish seine fisheries in Icelandic waters do not negatively affect the recovery of this species.

**Recommendation #3 (relating to clause 3.1.1 and 3.1.2).** Several fisheries management plans (e.g. those for cod, haddock, saithe and redfish) state that it is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs). VMEs of particular importance within Iceland include cold water coral communities and hydrothermal vent areas, but also deep-sea sponge aggregations (a threatened and declining habitat, according to OSPAR[2]) and sea-pen fields[3]. 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.

**Recommendation #4 (relating to clause 3.2.2.3)**
The assessment team recommends that the population and status of harbour porpoise (*Phocoena phocoena)* in Iceland is appropriately monitored and quantified due to conflicting abundance estimates (e.g. resulting from absolute and relative survey abundance indexes[4] and recent modelling efforts[5]) due to the potential risk of significant depletion to its population, specifically in regard to performance against proposed thresholds (e.g. ASCOBANS annual replacement potential of 1.7% for harbour porpoises[6], or 2018 PBR limit of 3500 porpoises[5]).

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

[2] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/Ecosystem_overview-Icelandic_Waters_ecoregion.pdf
[3] https://novasarc.hafogvatn.is/project/
[4] https://nammco.no/wp-content/uploads/2019/11/final-report_aewg-20192.pdf
[5] https://www.ascobans.org/sites/default/files/document/ascobans_ac25_inf.4.3a_joint-imr-nammco-ws-harbour-porpoise.pdf
[6] http://www.ascobans.org/en/document/ospar-background-document-harbour-porpoise-phocoena-phocoena

  

### 1.1.2. Recommendation of the Assessment Team

**The assessment team recommends that the management system of the applicant fishery, the Icelandic cod (*Gadus morhua*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by demersal trawl, long-line, gill net, Danish seine net, (and hook and line by small vessel gear) and indirectly by Nephrops trawls, shrimp trawls, pelagic trawls and purse seines within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), be granted re-certification to the Icelandic Responsible Fisheries Certification Programme.**

### 1.1.3. Certification Committee Determination

A Certification Committee met on January 17th, 2020 to objectively review the Final Assessment Report and Determination / Recommendation of the Assessment Team. The Certification Committee comprised of two fishery experts and a certification expert, all independent from both the Assessment Team and the Peer Review team. The aim of the Certification Committee was to reach a determination to either award, defer (pending clarification) or reject certification. Upon careful review and consideration of the report, and further clarifications requested and provided, the Committee agreed with all the findings and scores, including the minor non-conformances applied (and related corrective action plan/evidence received from the client) as well as with the Recommendations recorded by the Assessment Team. The Committee also requested some minor clarifications to be made within the report. The Assessment Team agreed and integrated these changes within this final assessment and certification report. The Committee decision was to grant certification.

  

## i. Schedule of Key Assessment Activities

| Assessment Activities | Date |
|---|---|
| Application date | July 2018 |
| Start of Initial Re-Assessment Review | August 2018 |
| Appointment of Full Assessment Team | October 2018 |
| On Site Visit | November 2018 |
| Draft Full Assessment Report | August 2019 |
| Client Review | October 2019 |
| Peer Review | December 2019 |
| Certification Committee review/decision | January 2020 |
| Final Re-Assessment Report (published) | January 2020 |

  

## 2. Assessment Team Details

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# 3. Introduction

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

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

This is the 2019 Re-Assessment report for Icelandic cod comprising a full assessment of the fishery against the requirements of the IRF standard version V2.0. Ultimately, this assessment evaluates whether current practices in the management of the cod fishery remain consistent with criteria contained in Revision 2.0 of the IRF Standard.

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

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

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

  

# 4. Fishery Applicant Details

**Table 1.** Fishery applicant details.

| **Applicant Contact Information** | |
|---|---|
| **Organisation/Company Name:** | Samtök fyrirtækja í sjávarútvegi (SFS) (Fisheries Iceland) |
| **Date:** | July 2018 |
| **Correspondence Address:** | Samtök fyrirtækja í sjávarútvegi (SFS) |
| **Street:** | Borgartún 35 |
| **City:** | Reykjavík |
| **Country:** | Iceland |
| **Postal Code:** | |
| **Phone:** | (354) 591 0300 |
| **Web:** | www.sfs.is |
| **E-mail Address** | info@sjavarutvegurinn.is |
| **Organisation/Company Name:** | The National Association of Small Boat Owners, Iceland (NASBO) |
| **Date:** | July 2018 |
| **Correspondence Address:** | Landssamband smábátaeigenda |
| **Street:** | Hverfisgötu 105 |
| **City:** | 101 Reykjavik |
| **Country:** | Iceland |
| **Postal Code:** | IS-101 |
| **Phone:** | (354) 552 7922 |
| **Web:** | www.smabatar.is |
| **E-mail Address:** | ls@smabatar.is |

  

# 5. Background to the Fishery

## 5.1. Species Biology

**Icelandic cod biology, genetics and migration**

The Icelandic cod stock is distributed all around Iceland, and as part of the stock assessment, landings of cod within the Icelandic EEZ waters are assumed to be from a single homogeneous unit. Spawning takes place in late winter mainly off the southwest coast but smaller, variable regional spawning components have also been observed all around Iceland. The conventional wisdom has been that pelagic eggs and larvae from the main spawning grounds off the southwest coast drift clockwise northwards and eastward along the island to the main nursery grounds off the north coast. The mature stock takes on feeding migration from the spawning grounds to feeding grounds both to deeper waters in the northwest and southeast or within the shallow water realm of the continental shelf proper[7].

A larval drift to Greenland waters has been recorded in some years and substantial immigrations of mature cod from Greenland which are considered to be of Icelandic origin have been observed in some periods. This pattern was considered to be quite prevalent prior to 1970, when condition in Greenlandic waters were favourable for cod productivity. Periodic immigrations have been estimated in the assessment from anomalies in the catch-at-age matrix with timing and age of such events being based on expert judgement using external information. The most recent of such migration was from the 1984-year class in 1990, the number estimated around 30 million. Recent tagging experiments as well as abnormal decline in survey indices in West Greenlandic waters indicate that part of the 2003 and to some extent the 2002-year classes may have migrated from Greenland to Icelandic waters. In the current assessment the immigration at age 6 in 2009 is estimated around 9.7 million corresponding an additional biomass of around 31 kt in 2009. The influence of this immigration on the current biomass estimate is minimal.

A slight but significant genetic difference has been observed between the cod spawning in the northern waters vs. cod spawning in the southern waters (Pampoulie et al., 2007). There are indications that different behavioural type (shallow vs. deep migration) may be found within cod spawning in the same areas (Pampoulie et al., 2008). In addition, genetic comparisons of cod sample in Greenlandic waters indicate that there is genetic affinity of mature cod in Icelandic and east and southwestern Greenlandic waters.

Extensive tagging experiments spanning with some hiatuses over the last 100 years indicate that significant emigration of adult cod from Iceland to other areas may be rare. In recent years it has been observed that cod tagged in Iceland has been recaptured inside Faroese waters on the Faroese ridge proper. Anecdotal information from the fishing industry indicate that there may be some exchange of cod across the Denmark Strait. These migrations may be of different nature than the hypothesised net “life-history” immigration of cod described above.

## 5.2. Fishery Location and Method

Icelandic cod in Iceland area 5.a1 are considered one unit by ICES (see ICES Statistical Areas below).

[7] http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2015/cod-iceg_SA.pdf

  

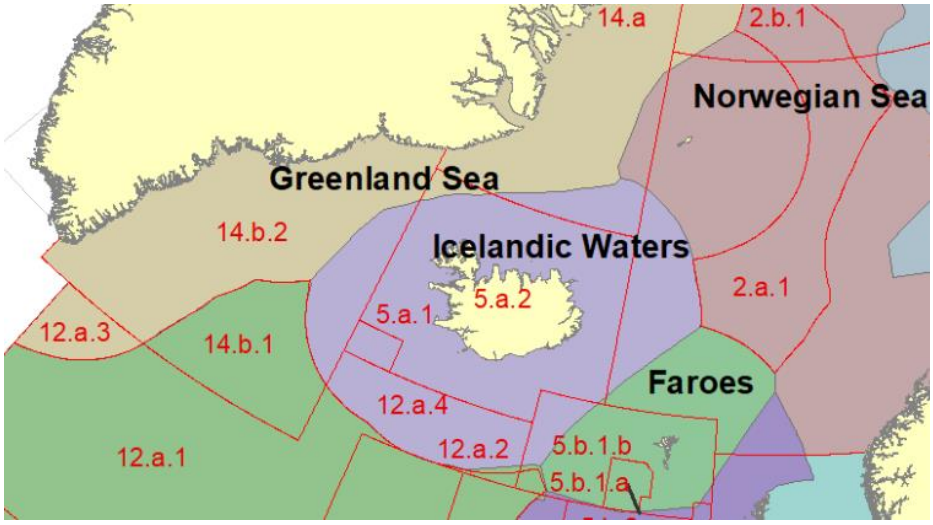


**Figure 1**. ICES Statistical areas 5.

**Catch distribution by gear type**

ICES reports that Icelandic cod catches from the 2015/16 to 2017/18 season have been caught in these proportions by 5 main gears:

| Icelandic cod total catches[8] | | Bottom Trawl | Longline | Gillnet | Demersal seine | Handlines/ jiggers | Total |
|---|---|---|---|---|---|---|---|
| 2017/18 | 270,217 t | 51% [9] | 30% | 7% | 6% | 6% | |
| 2016/17 | 237,644 t | 49% [10] | 32% | 7% | 6% | 6% | |
| 2015/16 | 251,000 t | 45% [11] | 35% | 8% | 6% | 6% | |
| **Average** | | **48.3%** | **32.3%** | **7.3%** | **6%** | **6%** | **99.9%** |

Spatial distribution of catches per gear type also appears to have remained relatively consistent overtime indicating that fishermen tends to fish in the same ground year after year (see the MFRI Cod Technical Report 2019[12]). Below we present the catch location for bottom trawl, gillnet, longline and Danish seine gear in 2018 to graphically represent where the main cod catches occur in Icelandic waters.

[8] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf
[9] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf
[10] http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cod.27.5a.pdf
[11] http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cod.27.5a.pdf
[12] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf

  

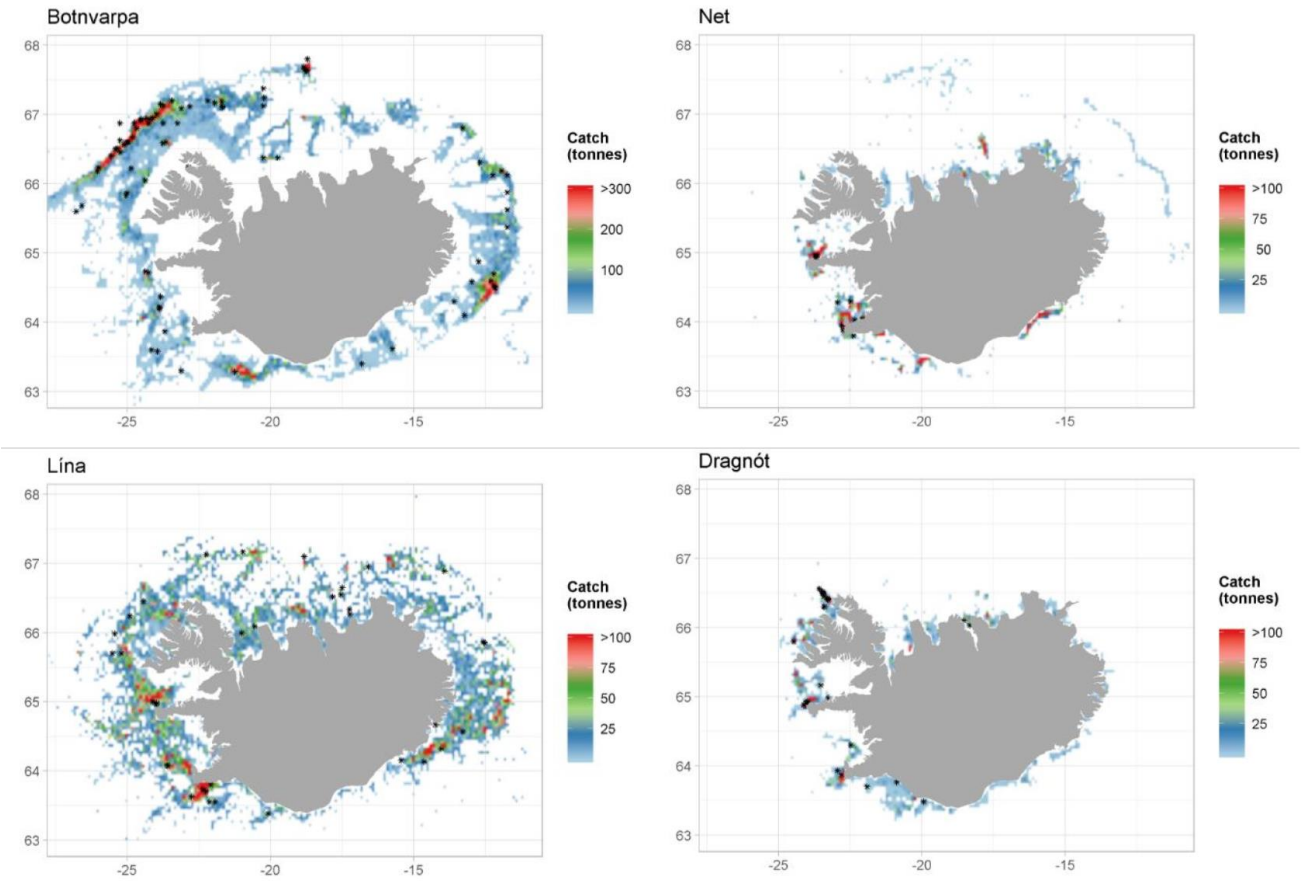


**Table 2.** Cod catches in 2018 by gear type according to catch logs and location of samples from landed catches. Top left: Bottom trawl. Top Right gillnet. Bottom left longline. Bottom right: Danish seine. Source: MFRI Cod Technical Report 2019[13].

**Fishing gear Description**

**Bottom Trawl**

The bottom trawl or otter trawl is the most important gear used in the Icelandic fisheries and has been adapted to suit various conditions of different fisheries[14]. It is used at varying depths, ranging from 80 m to 1500 m. Trawls are used throughout the year, but the catch composition may vary depending on the season. The fish species most often caught by bottom trawl are cod, demersal redfish, haddock, saithe and Greenland halibut but trawls also catch large amounts of plaice, Atlantic catfish, spotted catfish, ling, blue ling, tusk, great silver smelt and lemon sole. In the ground fish fisheries, the minimum mesh size is 135 mm and selectivity devices are also required in some fishing areas. In order to overcome by catch issues, a range of selectivity devices have been developed that exclude the by catch from the square part of the trawl. The devices are usually grids that will exclude the by catch which may be either larger than the target species in case of immature small fish in the shrimp fisheries or it may

[13] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf
[14] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/

  

be smaller than the target species such as small fry and immature shrimp in the shrimp fisheries. Various sensors are also attached to the trawl to measure how much fish is entering the trawl and how much is in the cod end (the end of the trawl). Trawling is generally not allowed within 12 nm from the coast, except off the south coast during part of the year, outside the 12 nm limit certain areas are permanently closed to trawlers due to abundance of juvenile cod.

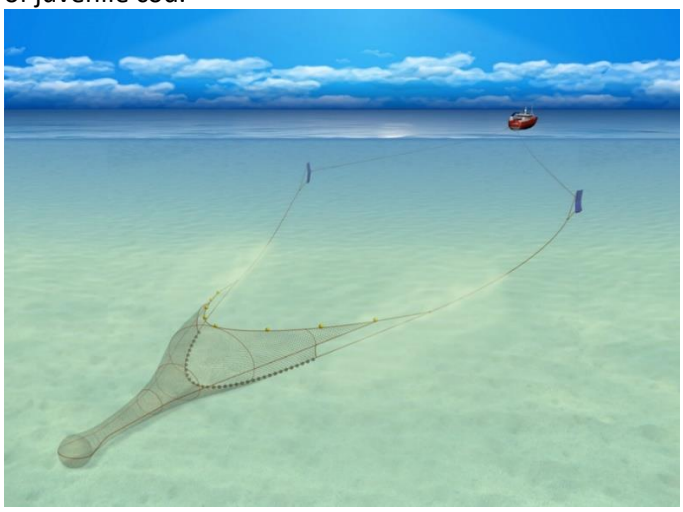

**Figure 2.** Demersal (bottom) trawl gear graphic with off-bottom semi-pelagic doors (source: Seafish[15]).

Bottom trawls in Iceland operate with pelagic or semi-pelagic "flying" doors that avoid drag on the seafloor. There are several designs and types used in Iceland but common ones are shown below. Common use of "T90 bottom trawls" (i.e. a regular net that has been turned 90° and along with lines on the codend ensuring that the mesh stays open during trawling resulting in 30% lesser net and drag) and pelagic doors[16] has resulted in considerable fuel savings, better selectivity of some species[17] and decreased habit impacts.


[15] https://www.seafish.org/gear/gear/profile/semi-pelagic-trawl
[16] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/
[17] https://www.icefish.is/news101/better-redfish-selectivity-with-four-panel-codend

  

**Figure 3.** Different trawl doors used for demersal fishing in Iceland (source[18] [19] [20]).

Bottom trawlers in Iceland are also reported to use rock hoppers to decrease the impacts and drag between the gear and the seabed (pers. comm. HB Grandi, Nov. 2018 site visits) (Figure 4).

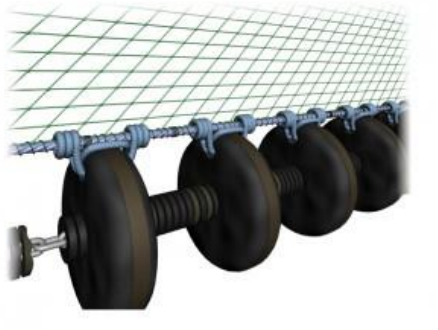

**Figure 4.** Rock hoppers used for bottom trawl fishing in Iceland.

## Longline gear

### Longline

As for most other fishing gear, the long-line fishery has become increasingly mechanized in recent years. Baiting and other parts of the long-lining process are now commonly done automatically at sea by machines[21]. The long-line fishery can be split into traditional shallow and recent deep-water fisheries. Cod and haddock are the primary targets in shallow water fisheries. Most of the cod catch is caught at depth of 50-250 m (see figure 5 of MFRI 2019 Cod Technical report[22]). The deep-water boats are much fewer, larger and more mechanized than those involved in shallow-water fisheries. The longlines used in Iceland are reported to have an average 40,000 hooks per longline (Visir HF, site visits meetings in Nov. 2018). The long-line is usually left on the bottom for one to four hours. The bait is most often herring, mackerel, capelin, imported saury (*Cololabis saira*), sandeels or squid pieces and lately artificial bait. One of the major benefits of using the long-line is that it can be used on rough ground where other types of fishing gear such as bottom trawl cannot be operated. Another benefit from using long lines versus many other types of fishing gear is that the fish are usually alive when the line is hauled into the boat and delivers a better-quality product.

[18] http://www.polardoors.com/project-type/bottom-trawl-doors/
[19] http://thyboron-trawldoor.dk/products/semipelagic-trawldoors/
[20] https://www.vonin.com/en/fishing/trawl-doors/semi-pelagic-trawl-doors/storm-semi-pelagic-trawl-door/
[21] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/
[22] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf

  

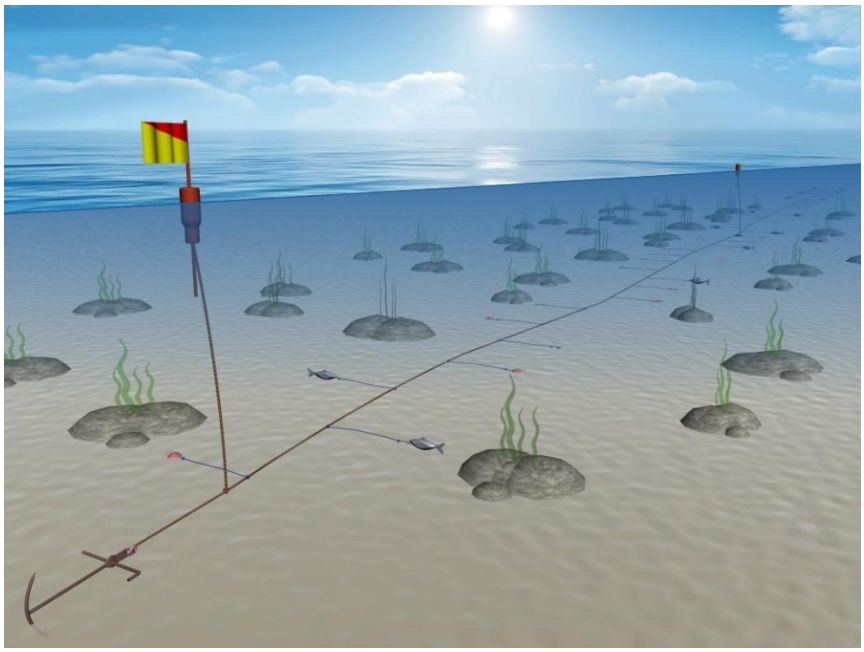

**Figure 5.** Bottom longline representation. Source: Seafish[23]

There are technical measures/mechanisms in place in Icelandic longliners to mitigate adverse impacts on seabirds. These include the use of acoustic cannons, balloons towed at the end of the vessel to scare-off of diving birds, and night settings to minimise interactions with seabirds. Setting longlines at night (between the end of nautical twilight and before nautical dawn) is effective at reducing incidental mortality of seabirds because the majority of vulnerable seabirds are diurnal foragers. This, however, being an advantage in winter, becomes a challenge in the summer when daylight hours exceed hours of darkness. The Directorate also highlighted that laser lights are being used widely as a deterrent.[24]

Based on the Agreement on the Conservation of Albatrosses and Petrels (ACAP) advice, the key technical bycatch reduction measures for longlines are: line weighting, bird-scaring lines and night-setting. In comparison, Iceland uses night settings, trailing balloons instead of bird scaring lines (at least to some degree), and some form of weighted lines.

**Danish seine**

Danish seine is used chiefly to target flatfishes but also to catch large quantities of cod and haddock. It is used in the fisheries all around Iceland, but the bulk of the effort is southwest and west of the country. It is mostly used in shallow waters at depths of 40-60 m. Minimum mesh size for Danish seine is 135-155 mm depending on fishing areas. The boats using Danish seines are similar in size to long-liners and gillnetters. In fact many boats switch between gear types seasonally. Danish seine are similar to bottom trawls and are made up of wings, belly, and a codend, but are operated differently, particularly as trawl doors (otter boards) are not used to keep the Danish seine open. If good navigational equipment is available and the grounds are well known, the seine can be used

[23] https://www.seafish.org/gear/gear/profile/long-line
[24] https://abcbirds.org/wp-content/uploads/2015/05/ABC_Analysis_of_MSC_Certification_on_Seabird_Bycatch_Pt_2_Fishery_Analyses.pdf

  

very efficiently, for example on very rough grounds interspersed with small patches of good grounds, where bottom trawlers cannot operate.

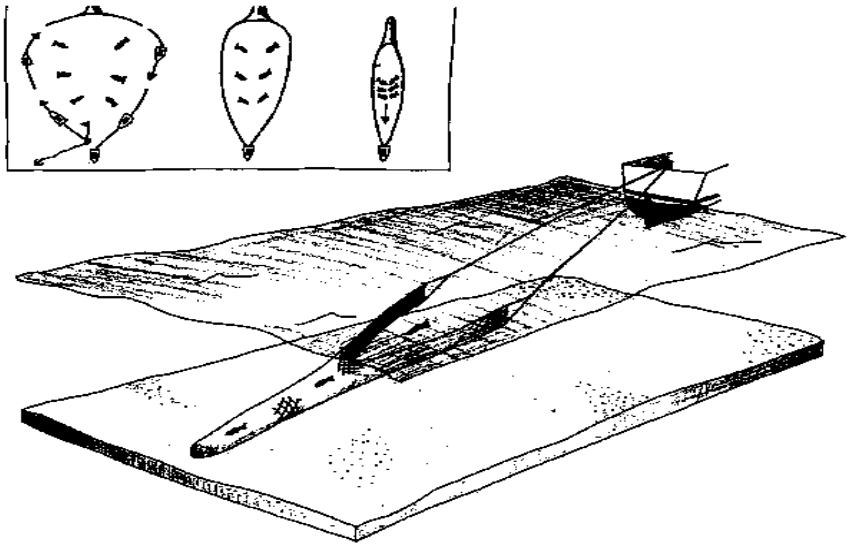

**Figure 6.** Danish seine with 3 stages of the catches process[25].

**Gillnets**

Gillnets are mainly used by small to intermediate sized boats. Fish are unable to see the net and so get entangled by the gills. Nets are rectangular and kept vertical by floaters on top and lead-weights at the bottom. Each net is approximately 50 m long, but a few nets are tied together and a number of such units placed by each ship. The nets are soaked overnight or longer to maintain the quality of caught fish. Gillnets are fished all around Iceland but particularly in the South and Southwest where the main spawning grounds are. There are nets optimized for haddock (140-150 mm mesh size), but these are not in large scale use. Nylon has made the nets stronger in recent years, thinner and much lighter. New synthetic fibres have also been used recently. Lead weights sinkers were introduced in 1979 which replaced the use of stones.

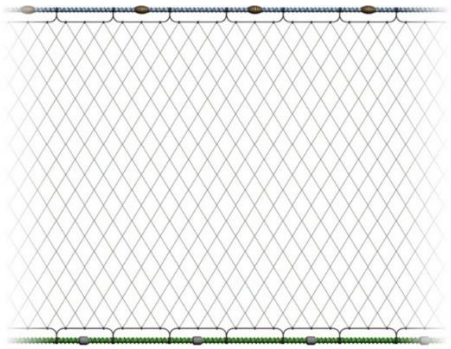

**Figure 7**. Gillnet (Source: Seafish gear database[26])

[25] http://www.fao.org/3/i0053e/i0053e.pdf
[26] https://www.seafish.org/gear/gear/profile/gill-nets

  

## 5.3. Fishery Management History and Organization

Fishery resources and their exploitation have shaped the economy and social history of Iceland for centuries. In recent history they have provided valuable export commodities, such as salt cod and shark liver oil in the 19th century and have become the foundation for an economic renaissance and development in Icelandic society. The introduction of motorized vessels, motor-boats and steam-trawlers during the first decade of the 20th century caused rapid expansion and changes in the Icelandic fisheries. The fishing effort was greatly enhanced as were catches. Within a period of two decades Iceland acquired a modern fishing fleet which was technically second to none in northern Europe and could go fishing all the year round. The fishing capacity of the new fleet of motor- and steam-vessels was much greater than that of the earlier fleet of rowing boats and decked sailing vessels. For the first time, Icelanders were able to utilize practically all fish stocks of the fishing grounds off their coasts (Ministry of Industries and Innovation, Iceland).[27]

In 1901 Iceland declared a fishing limit of three nautical miles which remained in effect until this was extended to four miles in 1952. As scientific knowledge of the fisheries resources increased it became clear that some of the most important fish stocks, most notably the cod stock, were under severe pressure by a multinational fleet and that strict fisheries management was needed and hence Iceland pursued the objective of achieving a 200-mile Exclusive Economic Zone (EEZ).

Important milestones on that path were the extension of Iceland's economic zone to 12 miles in 1958 and further to 50 miles in 1972. The 200 miles EEZ was fully effective from May 1976. A very important landmark in the campaign for jurisdiction was the national law set in 1948 (No.44/1948) for the scientific conservation of the continental shelf fisheries. The law is very brief. It states that the Icelandic Ministry of Fisheries will issue regulations concerning areas protected against fishing within the Icelandic continental shelf. Also, that these areas will be subject to Icelandic control with the main aim of scientifically based protection of fish stocks. All the extensions of the fishing limits after 1948 were based on this law. The United Nations Convention on the Law of the Sea *inter alia* codified the extension of coastal State national jurisdiction. It entered into force in 1994, one year after being ratified by 60 nations. Much earlier, in 1985, Iceland was the first state to ratify this treaty.

In 1975 foreign fleets were catching about half of the total catches of redfish and saithe, a third of the total cod catch, and a quarter of the total haddock catch. It was considered that no effective fisheries management for groundfish would be possible under those circumstances. When the 200mile EEZ became effective the foreign share of the catches declined rapidly and fishing was strictly controlled by agreements with other nations.

**1976-1983 Restrictions in TAC and effort.** Soon after gaining control over Iceland's EEZ in 1976, serious concerns were raised that the most valuable fish stocks were being overfished, cod being the most important. They advised a cod total allowable catch (TAC) of 230,000 MT for that year but the catch was 350,000 MT. From that point, effort restrictions were introduced. Trawlers were at first allowed to fish for 323 days a year, later only 215 days. The system was clearly very uneconomic. By 1983, the spawning stock of cod was estimated at an all time low, just over 200,000 tonnes and fishing mortality was very high. Catches were circa 100,000 tonnes in excess of recommendations.

[27] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/history-of-fisheries/

  

**1984 Individual vessel quotas.** A system of individual vessel quotas with some transfer rights was introduced in 1984. By this law, each fishing vessel received a fraction of the TACs in the beginning. The allocation of quota was based on the vessel's catches in the three previous years. TACs and individual vessel quotas were imposed for cod, haddock, saithe, redfish, Greenland halibut, plaice and ocean catfish.

**1985-1990 Effort option.** In 1985 an effort-based option in the demersal fisheries was introduced. More than half of the cod catch, even up to two thirds was effort based at the time and the vessels fishing under that option could periodically re-enter the catch quota system with a new track record. Furthermore, vessels of 10 GRT had free access to the fisheries until 1988 and boats under 6 GRT until 1990. TAC's were still above scientific recommendations in this period and catches were in excess of the TACs.

**1990 The Fisheries Management Act.** In 1990 a comprehensive and uniform Fisheries Management Act was established. By this Act, the Individual Transfer Quota (ITQ) system was established for most of the commercial fisheries. They were all subject to vessel catch quotas and there was no effort option for trawlers and the larger boats. The quotas represent shares in the total allowable catch. They are permanent, perfectly divisible and transferable.

The fishing year for groundfish stocks was set from Sept 1 to Aug 31 in the following year rather than the calendar year. This was an effort to channel fishing away from the summer months, when quality suffers more quickly and regular factory workers are on vacation.

Since 1991, a number of amendments have been made to the fisheries management system. In August 2006 the legislation was re-issued as Law no. 116/2006, thus including all the changes made to the original 1990 legislation.

The present comprehensive fisheries management system is still based on Individual Transferable Quotas (ITQs). The objectives are described in the Fisheries Management Act including; to promote the conservation and efficient utilisation of the marine resources and thus to ensure stable employment and economic viability of fishing communities. Stated aims are to ensure the sustainability of the fisheries while emphasising the economic benefits of the fisheries sector.

In addition to the ITQ system, Icelandic fisheries management includes many other management measures such as area restrictions, fishing gear restrictions, and the use of permanent and temporary closed areas to conserve important vulnerable habitats and juvenile fish stocks. Extensive provisions are made for temporary closures of fishing areas to protect spawning fish from all fishing. These measures are all meant to support and secure the sustainability of the fisheries.

Effective control and enforcement is an inseparable part of responsible fisheries management. The Directorate of Fisheries undertakes monitoring of the Icelandic fisheries to ensure that all rules are being followed. Iceland operates a comprehensive enforcement regime, in particular regarding port control and weighing of all catches. According to Icelandic law, discards are prohibited. All catches must be landed.

Scientific research is essential for successful management as extensive knowledge of the ocean around Iceland and its ecosystem must be the foundation regarding decisions on sustainable fisheries and other utilization of the natural resources of the sea.

  

**Organisation of Fishery Management in Iceland**

The Icelandic fisheries management system is well organised, with the Ministry of Industries and Innovation, the Directorate of Fisheries, the Marine and Freshwater Research Institute and Icelandic Coast Guard having central functions (Figure 8). There are other government departments linked to the management system for a range of purposes including the Ministry of Justice responsible for judicial proceedings and Statistics Iceland for collation of fishery statistics supplied by the Directorate. Port Authorities play an important role in monitoring and recording fish landings, overland transported fish and exports. They inspect, record and enter data on landing directly into the Directorate's central database through official Port Controllers. The food safety control of fishery products is under the jurisdiction of the Icelandic Food and Veterinary Authority (MAST), and all fish processing vessels and plants must be approved under the Icelandic Hygiene Regulations.

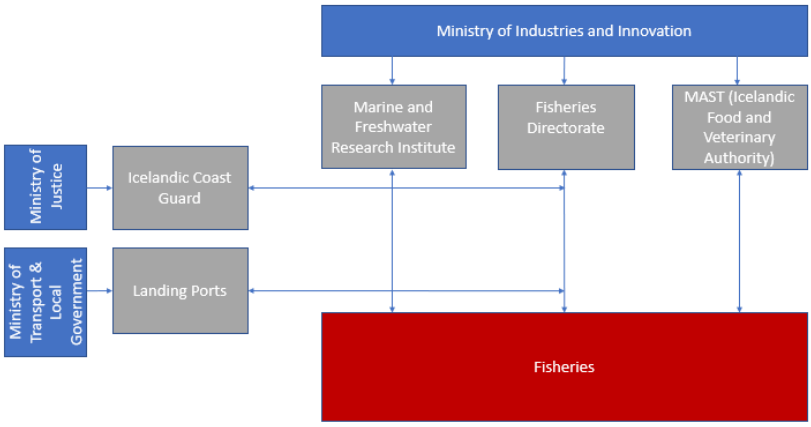


**Figure 8.** Basic Organizational Structure of Icelandic Fishery Management (Source: SAIG, modified from http://www.fiskistofa.is/fiskveidistjorn/).

**Ministry of Industries and Innovation**

The Ministry of Industries and Innovation (MII) covers all sectors of ordinary business and economic activity. It was formed on 1 September 2012 following the amalgamation of the Ministry of Industries and Innovation, the Ministry of Industry, Energy and Tourism and part of the Ministry of Economic Affairs. Within the Ministry, the Fisheries and Aquaculture Office is responsible for fisheries and aquaculture, creating an efficient management framework and development of policy. A large part of its work is in international affairs including the conclusion of international fisheries management agreements and participation in the work of international organizations.[28]

**The Directorate of Fisheries (Fiskistofa)**

The Directorate of Fisheries, called Fiskistofa in Icelandic, is an independent agency that belongs to the Ministry of Industries and Innovation. It has 61 staff (2017) located at 6 offices throughout the country with its headquarters in Akureyri. The Directorate of Fisheries is responsible for the implementation of laws and regulations on the management of fisheries in sea and fresh water on behalf of the Ministry. It also manages and controls fish farming, and collects and disseminates information on fisheries, aquaculture, salmon and trout

[28] https://www.stjornarradid.is/default.aspx?PageID=c2a9c95f-ec71-11e6-9417-005056bc530c

  

fishing and whaling. The Directorate has three core divisions: Salmon and Trout Fishing, the Fisheries Inspectorate and the Service and Information division, and two support divisions: Information Technology and Human Resources and Finance[29]. The main functions of the Fisheries Inspectorate are as follows[30]:

- Supervise the fishing of Icelandic and foreign vessels in Iceland's jurisdiction and the fishing of Icelandic vessels outside Icelandic waters.
- All catches of Icelandic fishing vessels must be weighed and recorded at the port of landing by a certified official weigher. The Fisheries Inspectorate is responsible for issuing weighing licenses for the weighing or re-weighing of marine catches and issuing production licenses to vessels that process on board.
- Monitor fishing gear and equipment, fishing permits and logbook entries.
- Fisheries inspectors monitor the species and size composition of catches and propose the closure of fishing grounds to protect small fish and prevent harmful fishing.
- Supervise fishing, processing and utilization activities on board processing vessels, and that the products of processing vessels are correctly recorded against catch quotas.
- Monitor export of unprocessed catches in containers and on fishing vessels and surveillance of domestic fish transport.
- Investigate violations and includes a legal department that makes decisions on the application of administrative penalties and / or sending criminal cases to the police.
- Collaborate with the Icelandic Coast Guard, the Marine Research Institute and the Director of Customs, as well as with foreign fisheries authorities and multinational organizations in this field.

All catches of Icelandic fishing vessels must be weighted and recorded at the port of landing by a certified official weigher. This can be done by either Directorate staff at ports or by certified individuals where fish is landed directly to the processing sector. The official record of the catch is recorded on a computer system that is directly linked to a centrally located database at the Directorate of Fisheries. Thus, 60 ports in Iceland send electronic data daily to the Directorate. A total of approximately 50,000 landings are registered in the system every year[31]. The data is processed in the Directorate´s database and catches are subtracted from the vessel´s quotas. The system is designed so that the Directorate can act quickly before vessels overfish their quotas. Excess catches can result in a revocation of fishing licenses and fines. Statistics Iceland then receives copies of the data for the production of statistics regarding the economy.

**The Marine and Freshwater Research Institute**

The Marine and Freshwater Research Institute (MFRI) is a government institute under the auspices of the Ministry of Industries and Innovation. The institute employs around 190 staff, operates 2 research vessels and 10 branches around the country, including an aquaculture experimental station. MFRI conducts various marine and freshwater research and provides the Ministry with scientific advice based on its research on marine and freshwater resources and the environment. MFRI is leading in marine and freshwater research in Icelandic territories and the arctic, providing advice on sustainable use and protection of the environment with an ecosystem approach by monitoring marine and freshwater ecosystems. The main research priorities are research on marine and freshwater ecosystems, sustainable exploitation of main stocks, ecosystem approach to fisheries management, research on fishing technology and seafloor/habitat mapping.[32] The MFRI's organisational chart is set out below (**Figure *9***).

[29] http://www.fiskistofa.is/umfiskistofu/
[30] http://www.fiskistofa.is/umfiskistofu/starfsemi/veidieftirlitssvid/
[31] http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/afli-og-aflaverdmaeti/
[32] https://www.hafogvatn.is/en/about/mfri

  

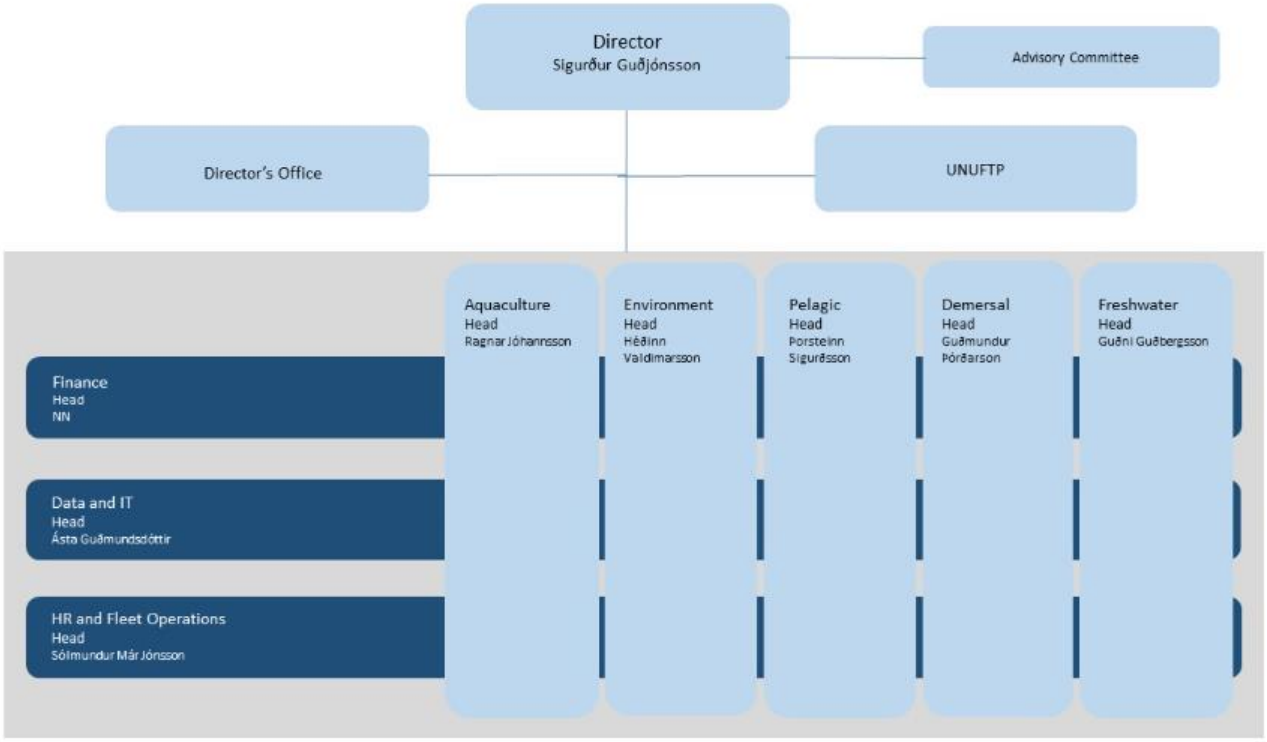


**Figure 9.** MFRI organizational chart (Source: https://www.hafogvatn.is/en/about/mfri).

The MFRI undertakes research on the exploited stocks of fish, crustaceans, molluscs and marine mammals, prepares stock assessments and formal advice on the total allowable catch (TAC) and sustainable fishing strategies for the government. Two ocean-going research vessels are currently operated by the MRI. The MRI is an active participant in the work of the International Council for the Exploration of the Sea (ICES) and its advisory Committee on Fisheries Management. The stock assessment findings of the MFRI are subject to review by ICES before the TAC recommendations are made. The MFRI is also represented in several other organizations, such as the Northeast Atlantic Fisheries Commission (NEAFC), the Northwest Atlantic Fisheries Organization (NAFO), the North Atlantic Marine Mammal Commission (NAMMCO) and the International Whaling Commission (IWC).

**The Icelandic Coast Guard**

A large part of the at sea surveillance falls directly under the responsibility of the Icelandic Coast Guard. The Coast Guard performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters and monitoring of fishing within the zone in consultation with the MFRI and Ministry of Industries and Innovation. In addition to patrolling the Icelandic EEZ, the Coast Guard performs surveillance and inspection duties in international areas, e.g. the NEAFC Regulatory Area which is the area outside the EEZ towards the South-West, South and East of Iceland. The Coast Guard is also responsible for rescue operations in the Icelandic Search and Rescue Region, more than twice the area of the EEZ. The Coast Guard operates the Icelandic Maritime Traffic Service within its operations centre. This centre is a single point of contact for all maritime related notifications, involving, for example, the Maritime Rescue Co-ordination Centre, the Vessel Monitoring Centre and the Fisheries Monitoring Centre. All hydrographic surveys in Icelandic waters are undertaken by them, including the preparation

  

of nautical charts. The Coast Guard operates rescue helicopters, offshore patrol vessels, coastal vessels, and maritime surveillance aircraft. [33]

**Fishing permits**

The primary legislative instrument relating to fisheries management in Iceland is the Fisheries Management Act No.116/2006 which forms the basis for the individual transferrable quota (ITQ) system in Iceland. It supersedes the Fisheries Management Act 1990 and established allocation harvest rights and permit requirements for all participating commercial fishing vessels. These permit requirements represent the initial legal requirement without which a vessel may not obtain the quota necessary to fish for Icelandic quota stocks.

**Allocation of fishing rights**

The Directorate of Fisheries issues annual catch quotas (kgs) to individual vessels as a share in the total allowable catch (TAC) which the Minister of Fisheries sets every year for each species. The annual catch quota is based on the individual vessels quota share (%). All major commercial stocks are now subject to quotas. The TAC of most of the species is issued for each fishing year, the period being from the 1st of September to the 31st of August the following year. Fishing rights can be either general catch quotas, catch quotas for hook and line boats (max 15 GT) or fishing days. The system has been amended to adapt to new changing circumstances and support the allocation of fishing opportunities on an equitable basis. Of course, there are some disputes and concerns of quota consolidation among a fewer larger organizations. However, there are fundamental rules such as no one vessel can have more than 12% share of the cod quota. A logbook and landings weight monitoring system is in place to ensure vessels remain within catch allowance.

**Note on Transfer of Quota**

It is permitted, under given circumstances, to transfer both quota shares and annual catch quotas between vessels. The quota shares can also be fully or partially transferred between vessels. Applications for transfer are submitted to The Directorate which verifies and registers the transfer. There are specific limitations on the size of quota share that can be controlled by one individual, company or legal entity (12%) and related partners. These limitations apply to both quota shares in individual species as well as total quota share. Sharing quota is based on 'cod equivalents'. These are based on weight and use cod, as the most important commercial species, as the common denominator to determine relative value of different fish species on the market. The value of different species in cod equivalents changes and is set by a regulation every year. For vessels with a quota of several species the total quota may be calculated in kg as cod equivalents.

**Flexibility in the ITQ system**

Flexibility is built into the ITQ system, enabling vessel owners and fishermen to make more efficient use of their quota allocation and fishing opportunities available to them:

- Vessels may fish in excess of their quota for individual species and reduce their quota allocation in other species (except cod) subject to certain restrictions (5% of the total value of demersal quota, 1.5% of individual species).

[33] http://www.lhg.is/english

  

- They may fish in excess of their catch quota to a certain limit (5% for demersal species) and deduct that % from their quota allocation in the following year.
- They may transfer up to 15% of the catch quota allocation from one year to the next.

Vessels may also decide not to include part of the vessels catch in its catch quota. This is limited to no more than 0.5% of the vessel's pelagic catch and 5% of other marine catches per fishing year. The bulk of profit from the sales of this catch (known as 'VS catch') go to a fund for fisheries research and monitoring, with 20% going to cover the operational costs of the vessel. As discarding of commercial species (and also non-viable specimens of protected species) is prohibited, this provision encourages fishers to land all commercial species but actively avoid catching vulnerable fish e.g. undersized fish or protected species.

### 5.4. Stock Assessment Activities

Icelandic cod is one of several cod stocks around the North Atlantic. It is largely confined to Icelandic waters where it is spread over the whole shelf. It has some links to the cod in East Greenland; larvae from Iceland can drift over to Greenland and in occasional years, cod of a year class in Greenland can migrate over to Iceland where it appears as an anomaly in survey indices at age.

The stock is assessed by the ICES NWWG using a software termed ADCAM. This is a forward projecting stock model with variable selection, fitted to catch and survey indices in numbers at age. The assessment covers the years from 1955 until present, for which there is catch numbers at age data. The method has been used with some modifications for Iceland cod since 2002. The last ICES benchmark was in 2015, but no changes were introduced at the time. The next benchmark is planned for 2021.

Landings statistics are available since 1905. Landings is only permitted in approved landing sites in Iceland and have to be weighted by authorized weighers. These data go directly into a database maintained by the Directorate of fisheries. Most cod is landed gutted. There is a fixed scaling factor to convert gutted to ungutted, which acts just as a scaling factor in practice. Discards are prohibited and are estimated by comparing length distributions from vessel catches with and without Directorate inspectors on board. These estimates indicate discards of small cod (high grading) in the order of a few percent, but we note that the Directorate inspectors coverage is limited. Logbooks are compulsory and the data are used for several purposes, mainly for verification purposes, but not directly in the stock assessment. There is a well-established system for sampling of catches for length, weight maturity and age. Catch numbers at age are obtained by combining landings data with mean weights, length measurements and age-length keys from these samples.

Two surveys are used in the assessment, the Icelandic bottom trawl survey in the spring and in the autumn. Both are more extensive than most surveys available to stock assessments. The station positions are standardized and shown in Figure 10.

  

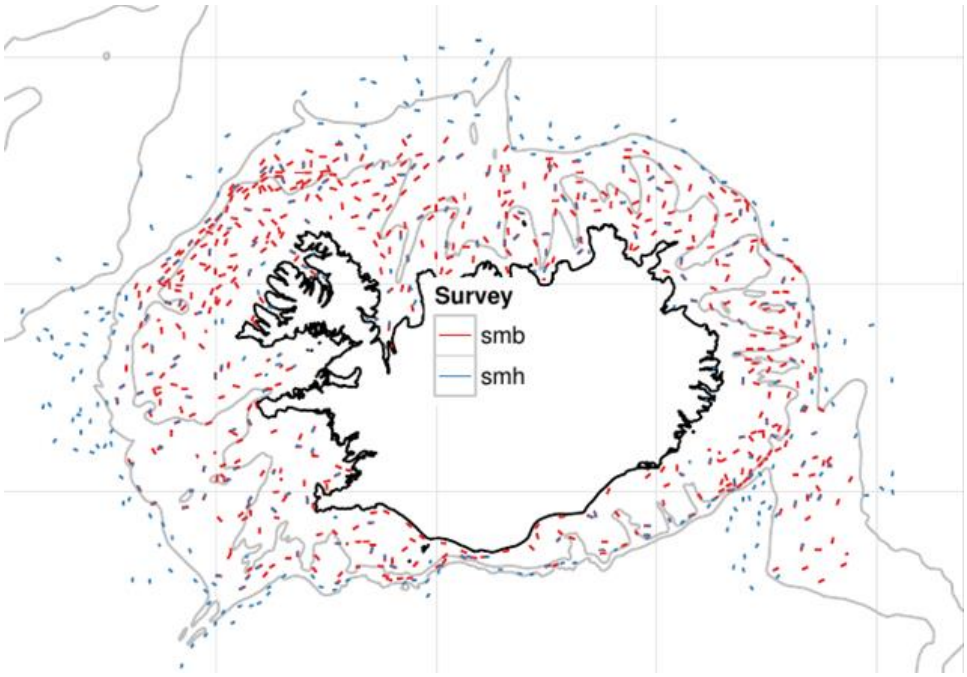


**Figure 10.** Trawl stations in the bottom trawl survey in the spring (smb) and autumn (smh).

The data inputs to the current assessment include:

- Catch in numbers at age from 1955 onwards, age 3–14;
- Catch weight at age over the same period;
- Spring survey indices from 1985 onwards, age 1–10 (approximately 550 stations);
- Fall survey indices from 1996 onwards, age 1–10 (approximately 320 stations);
- Weight-at-age and maturity-at-age in the spawning stock (derived from the spring survey estimates except in ten years and older, where catch weights are used).
- Natural mortality is set to 0.2 for all groups.

The results of the assessment are quite consistent from year to year. The retrospective patterns (Figure 11) show only a weak tendency to overestimate the stock and underestimate the fishing mortality. There is some discrepancy between the signals in the two surveys, however, the autumn survey indicating a somewhat larger stock than the spring survey. The assessment becomes a compromise between the two. The cause of this discrepancy is not fully understood, and it appears in other stock assessments using these surveys as well. This issue will be taken up in the planned benchmark assessment in 2021.

The data that are used in the assessment are regarded as sufficient for the method and of high quality. The level of exploitation according to the harvest rule which uses the stock estimate from ADCAM has been satisfactory in the sense that the harvest rate estimate is at the intended level, stock abundance has increased as expected, and the stock is now very healthy.

  

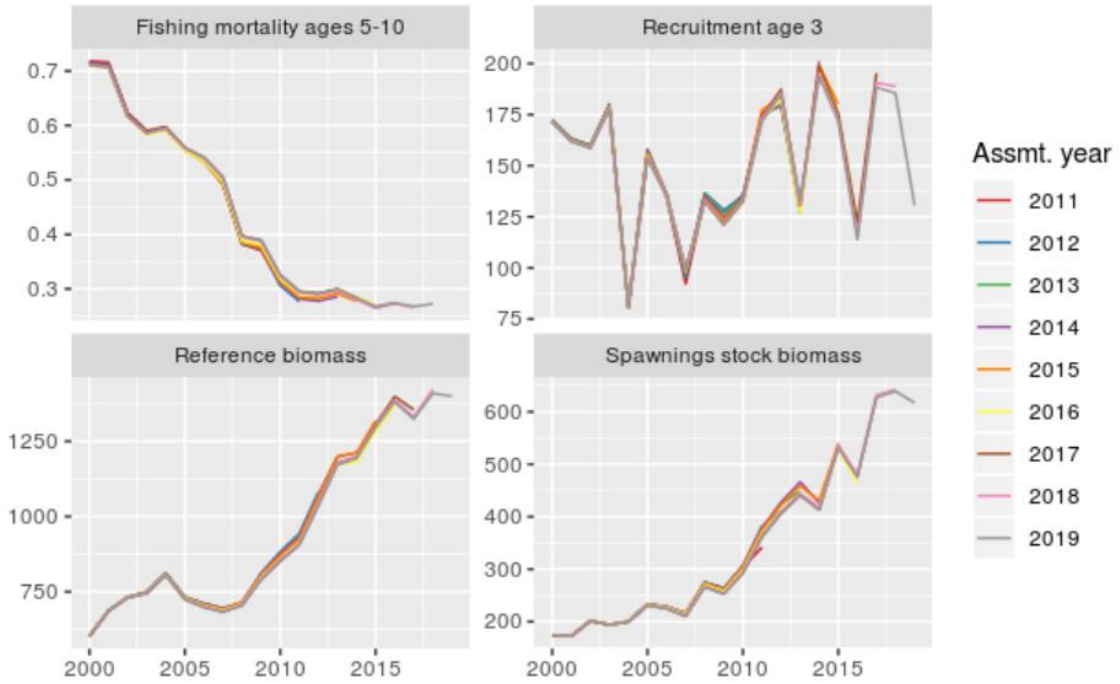


**Figure 11.** Analytical retrospective pattern of key metrics in the last eight years and the current estimates. Source: 2019 NWWG report.

## 5.5. Historic Biomass and Removals in the Fishery

Throughout the centuries, cod has been the lifeline of the nation, both as its main food supply, and its chief export product. Historical evidence suggests that story of Icelandic fish export dates back to the 12th century at the very least.[34]

Foreign vessels have been active in Icelandic waters for several hundred years. Icelandic attempts to control foreigners fishing around Iceland sometimes lead to violent conflicts. The motive for Iceland was both to protect its own industry, but also in some cases to stop overfishing leading to stock collapse. This was the case with herring in the 1960s in particular.

The last conflict was the 'cod war' with Britain 1975-76 when Britain refused to acknowledge the 200 nautical mile limit and called on her navy to protect British fishing vessels while trawling in Icelandic waters. The dispute soon reached an international level but was eventually settled in Oslo in May 1976[35]. The 200 nautical mile limit that was established in 1975 became internationally adopted during the 1982 UN Convention on the Law of the Sea (UNCLOS). After that, catches by foreign fleets in Iceland waters have been minor and according to bilateral agreements.

34https://www.iceland.is/trade-invest/fisheries
35https://www.government.is/topics/business-and-industry/fisheries-in-iceland/history-of-fisheries/

  

Before the extension of the EEZ to 200 miles at the end of 1975, effective management of the fisheries, especially the demersal ones, was impracticable due to the presence of large foreign fleets on the fishing grounds. Since then all Icelandic fisheries have come under extensive management restrictions.

During the period since the mid-1970s there was a development towards individual vessel catch quotas in the management of most fisheries which led to a uniform system of individual transferable quotas being adopted in 1990. The essential feature of the quota system is the Total Allowable Catch (TAC) which is set annually for each stock, based on scientific research and formal advice. While the TAC defines the overall catch quantity over one year the catch quotas are primarily distributed through the fixed share of the TAC for the individual vessel.[36] This system now covers all fleets except the smallest boats, that still have an effort regulation system.

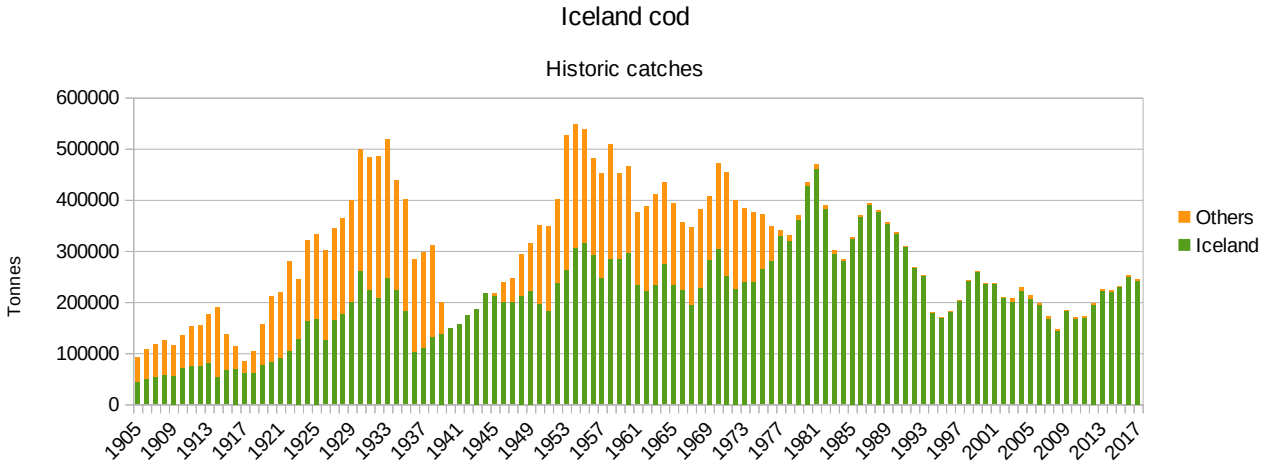


**Figure 12.** Historical landings of cod.

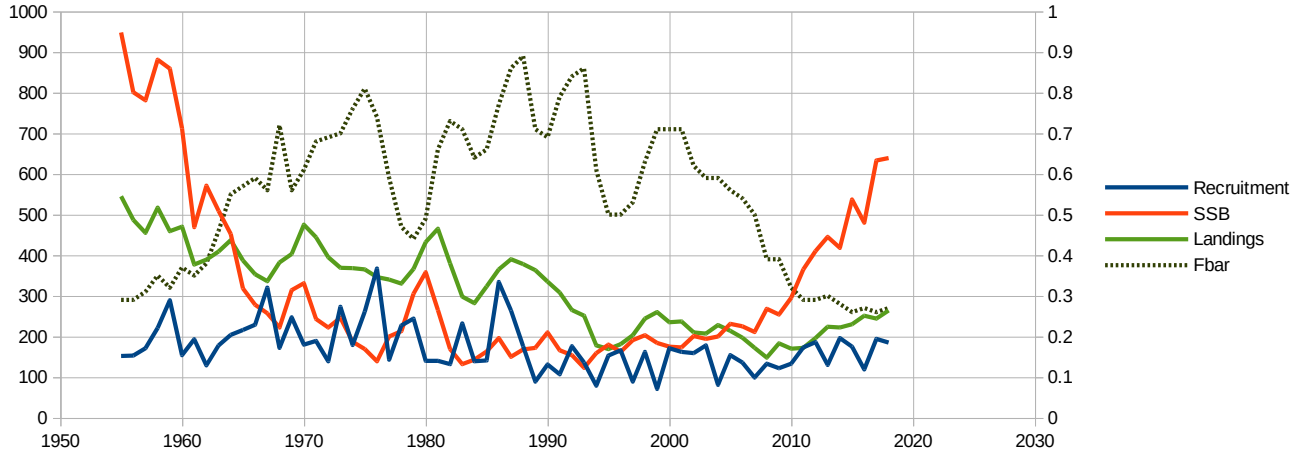


**Figure 13.** Development of stock abundance, catches and fishing mortality.

At the start of the assessment time series in 1955, the stock was large, presumably because the fishery was greatly reduced during WW2. Then, catches became high, the SSB declined fast, despite a fairly good recruitment, the

36https://www.government.is/topics/business-and-industry/fisheries-in-iceland/history-of-fisheries/

  

catches declined, and the fishing mortality became high. There was some reduction in recruitment from around 1990 onward, but never a full recruitment failure or stock collapse. Still, there was a situation with growth overfishing where a small stock was exploited with high fishing pressure and showing gradually declining catches. Various catch rules have been in effect since the mid-1990s, leading to a gradual reduction in fishing mortality. The development of the present type of harvest rule started in 2004. Emphasis was both on preventing overfishing and on maximizing economic yield, which was obtained by a lower harvest rate (20%) than practiced previously. The present rule that was implemented in 2009 and evaluated and approved in 2010. After that, the fishing mortality has remained around or slightly below 0.3 and the harvest rate near or below the agreed target level of 0.2. The stock has increased markedly, and the management is generally well accepted by the industry.

In the past 5 years, catches of cod have exceeded quotas by an average of about 3.5% a year (range -2% to +6%), except in the fishing year 2016/17, where the total catch was slightly below the TAC. The main cause seems to be allowances for fishery outside the standard ITQ system, in particular for local, small scale fisheries. Additionally, the landing of juveniles as part the overall discard ban measures will contribute to a small percentage of landings above TAC. These arrangements are according to law. The Assessment Team has issued a formal Recommendation (relating to clause 1.5.8.) relating to the issue of TAC overshooting (due to flexibility measures in Iceland) and how it may be addressed at the next management plan revision in 2021.

## 5.6. Ecosystem signals in the Icelandic Ecoregion

The MFRI is leading in marine and freshwater research in Icelandic territories and the arctic, providing advice on sustainable use and protection of the environment with an ecosystem approach by monitoring marine and freshwater ecosystems. The main research priorities are research on marine and freshwater ecosystems, sustainable exploitation of main stocks, ecosystem approach to fisheries management, research on fishing technology and seafloor and habitat mapping.

**Icelandic Waters ecoregion – Ecosystem Overview**

**Environmental conditions**

In the Icelandic Waters ecoregion, water masses of different origin mix. Relatively warm and saline Atlantic water enters the area, both in the southwest as a branch of the Irminger Current and in the east from the Norwegian Sea and over the Jan Mayen Ridge. The East Greenland Current carries cold, low salinity water from the Greenland Sea in the north into the Icelandic Waters ecoregion. The variable location of the fronts between the colder and fresher waters of Arctic origin and the warmer and more saline waters of Atlantic origin result in variable local conditions, especially on the northern part of the shelf. During the last two decades, the Atlantic water mass has been dominating, in contrast to the Arctic domination in the previous three decades.

**Key ecosystem and environmental signals in Icelandic waters in 2018 (source 2018 ICES Ecosystem Overview[37])**

- Zooplankton biomass on the northern shelf has fluctuated in the past, cycling on a five- to ten-year periodicity, with a period of generally low biomass from the 1960s to the 1990s.

37 https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/IcelandicWatersEcoregion_EcosystemOverview.pdf

  

- From the mid-2000s, Atlantic mackerel *Scomber scombrus* extended its feeding grounds from the Norwegian Sea to Icelandic Waters ecoregion, while the summer feeding grounds of capelin *Mallotus villosus* moved westwards from Icelandic into Greenland waters. Norwegian spring-spawning herring *Clupea harengus* has, since the early 2000s, reappeared at its traditional feeding grounds east and north of Iceland. These major changes in migration patterns have been linked to prey availability, oceanographic conditions, and stock density.
- Increased temperature in the lower water column on the western and northern part of the Icelandic shelf has resulted in changes in spatial distribution for a number of demersal species. Species like haddock *Melanogrammus aeglefinus*, anglerfish *Lophius piscatorius*, ling *Molva molva,* tusk *Brosme brosme*, dab *Limanda limanda*, and witch *Glyptocephalus cynoglossus* that have previously had Icelandic waters as their northern boundary of distribution and have mainly been recorded in the warm waters south and west of Iceland, are now showing a northward clockwise trend in their distribution along the shelf, and in some cases a distributional shift. Warming waters has led to a decline in the stock abundance and distribution of many cold-water species, while the previously rare occurrence of warm-water species in the ecoregion has increased in recent years.
- The stocks of northern shrimp *Pandalus borealis* collapsed around the year 2000 and the driving factors are thought to be increased predation by gadoids, increasing temperature, and high fishing mortality.
- Improved management measures for most of the major stocks (cod *Gadus morhua*, haddock, saithe *Pollachius virens*, redfish *Sebastes* sp., herring) have resulted in decreased fishing mortality, close to or at FMSY, and increased SSBs. This has furthermore resulted in decrease in effort and less pressure on benthic habitats.
- A recruitment failure of sandeel (Ammodytidae) was recorded in 2005 and 2006, and, with the exception of the 2007 cohort, recruitment has been at a low level since then. Fish stomach content data suggest that the decline in the sandeel population may even have started as early as around year 2000.
- The abundance of minke whales *Balaenoptera acutorostrata* has decreased on the Icelandic shelf in recent years, following changes in prey distribution. Abundance of other species, in particular fin whales *Balaenoptera physalus* and humpback whales *Megaptera novaeangliae*, have increased over the last 20 to 30 years.
- In recent decades, the breeding success of many seabird species has been poor in south and west Iceland, accompanied by declines in their breeding population sizes. These trends may be influenced by changes in density, composition, and spatial distribution of their main fish prey (i.e. sandeel).

## 5.7. Economic Value of the Fishery

Expansion and development of the fisheries was the driving force behind Iceland's economic transformation during the 20th century[38]. Fisheries remains one of the pillars of the Icelandic economy, responsible for a fair share of both the GDP and the nation's export revenue[39]. Statistics Iceland analysis show the profits of the main sub-sectors of fishing activities in Iceland such as boats in several size categories, pelagic vessels, wet fish trawlers, freezing trawlers, processing of demersal species like freezing and salting, processing of pelagic and fresh fish processing. The net profit of fishing and fish processing total decreased somewhat between 2016 and 2017[40] or

[38] https://www.researchgate.net/publication/42764430_The_Role_of_the_Fishing_Industry_in_the_Icelandic_Economy_A_Historical_Examination

[39] https://www.iceland.is/trade-invest/fisheries

[40] http://hagstofan.s3.amazonaws.com/media/public/2019/ddeaeeb9-de47-4295-ac6d-ea586375218d.pdf

  

from 14,4% to 6,5% (corrected for the effect of changes in the exchange rate according to the annuity approach and 6% rate of return). Net profit of fishing for demersal species decreased from 14% to 2,5% and net profit of processing of demersal species decreased from 10,1% to 9,1%. The aggregated balance sheet of fishing and fish processing in 2017 shows that the total worth of assets of the fisheries are ISK 660 billion, liabilities are worth of ISK 384 billion and equity nearly ISK 276 billion. The economic value of the Icelandic cod fishery has increased steadily between since the mid-1990s. The value of the Icelandic cod catches in 2018 was valued at ISK 55 billion (~ EUR 400 Million) by statistics Iceland[41].

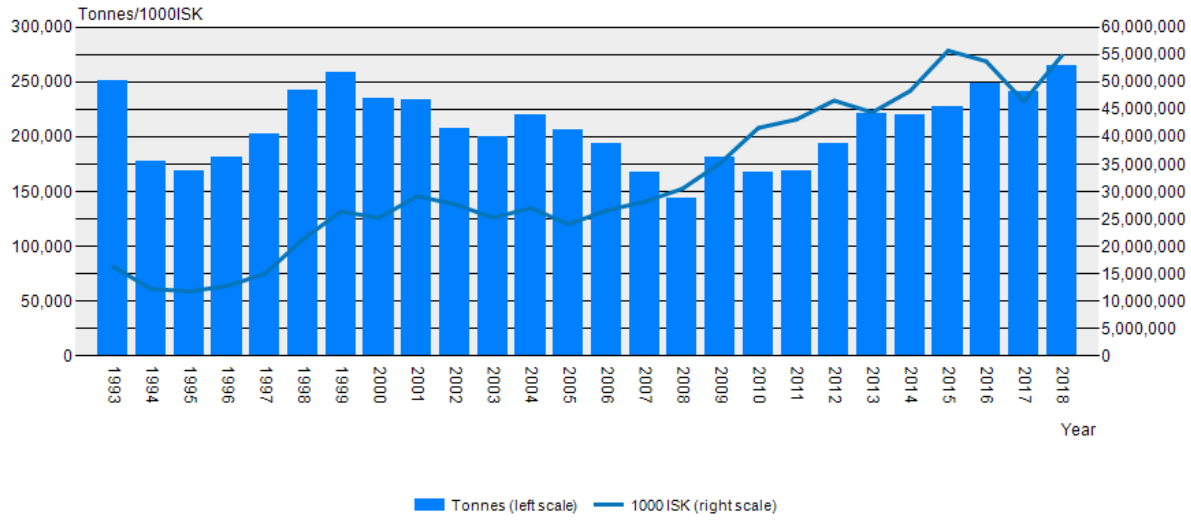


**Figure 14**. Icelandic cod catch (t) and catch value (ISK 1000) 1993-2018. Source: Statistics Iceland.

[41] https://www.statice.is/statistics/business-sectors/fisheries/

  

# 6. Proposed Unit(s) of Assessment and Certification

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

**Table 3.** Unit(s) of Assessment (UoA).

| **Units of Assessment (UoAs)** | | |
|---|---|---|
| **Species:** | **Common name:** | Atlantic cod (Þorskur) |
| | **Latin name:** | *Gadus morhua* |
| **Geographical Area(s):** | | Iceland 200-mile EEZ within FAO Fishing Area 27 |
| **Stock(s):** | | Cod in ICES Division 5a (Iceland grounds) |
| **Principal Management Authority:** | | Ministry of Industries and Innovation (Iceland) |
| **Fishing gears:** | | Demersal trawl |
| | | Long-line |
| | | Gill net |
| | | Danish Seine |
| | | Hook and line (Handline) |
| | | Gears from other Icelandic fisheries legally landing cod* (Nephrops trawl, shrimp trawl, pelagic trawl, purse seine) |

*comprised of gears contributing less than 1% to total landings of target species.

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

**Table 4.** Unit of Certification.

| **Unit of Certification (UoC)** | | | | |
|---|---|---|---|---|
| **Species:** | **Common name:** | Atlantic cod (Þorskur) | **Stock:** | Cod in ICES Division 5a (Iceland grounds) |
| | ***Latin name:*** | *Gadus morhua* | | |
| **Geographical Area(s):** | | Iceland 200-mile EEZ within FAO Fishing Area 27 | | |
| **Principal Management Authority:** | | Ministry of Industries and Innovation (Iceland) | | |
| **Fishing gear(s):** | | Demersal trawl<br>Long-line<br>Gillnet<br>Daish Seine<br>Hook and line (Handline)<br>Gears from other Icelandic fisheries legally landing cod*<br>(Nephrops trawl, shrimp trawl, pelagic trawl, purse seine) | | |

*comprised of gears contributing less than 1% to total landings of target species.

  

# 7. Consultation Meetings

## 7.1. On-Site Assessment and Consultation Meetings

**Table 5.** Summary of Meetings, cod commercial fishery (as part of combined cod, haddock, saithe and golden redfish site visits). Fishery site visits, 27th -29th November 2018.

| Date | Organization, location and representative | Main Topics of Discussion |
|---|---|---|
| Tuesday 27th of November 2018 | 09.00 The Client (opening meeting)<br>Kristján Þórarinsson, Fisheries Iceland<br>Axel Helgason NASBO<br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Introduction and audit plan/objectives<br>• Confirm Units of Certification for cod, haddock, saithe and golden redfish including gear used (any changes from previous year?)<br>• Changes in fisheries management<br>• Status of stock under assessment<br>• Current issues<br>• Coastal fisheries and rest of the fleet<br>• Ministry bycatch working group |
| Tuesday 27th of November 2018 | 10.00 Marine and Freshwater Research Institute (MFRI)<br><br>Guðjón Már Sigurðsson;<br><br>Steinunn Hilma Ólafsdóttir;<br><br>Bjarki Þór Elvarsson<br><br><br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Changes in data sources, data preparation and assessment method for any of the stocks - now or since last benchmark.<br>• Plans for revisiting/updating Fishery Management Plans or benchmark assessments.<br>• New information on the genetic structure of cod, haddock, saithe and redfish in Icelandic waters.<br>• Landings and catch weights for un-gutted vs. gutted.<br>• Discards rates for cod, haddock, saithe and redfish<br>• Changes in distribution and migration<br>• New studies on fishing gear selectivity<br>• Area closures<br>• *Redfish* Assessment retro problem<br>• Length based indices from the spring survey<br>• Splitting by species<br>• Faroes in international agreements<br>• 90-10 split between Iceland and Greenland<br>• *Cod* current management plan, stock increases and cod in the catches is getting very large.<br>• Pressure to change the rule to allow different cod exploitation<br>• *Haddock* general issues, recruitment pattern<br>• *Saithe* retro-pattern,<br>• Catches below quotas<br>• implications for transfer between species |

  

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|---|---|---|
| | | • Management-industry stakeholder consultation arrangements<br>• Short term closures (e.g. 2 week closures) implemented in Icelandic waters to protect juveniles of cod, haddock, saithe and redfish,<br>• Skippers logbooks accounting by MFRI<br>• New studies/reports on bycatch related to the fisheries catching cod, haddock, saithe and redfish<br>• Spotted wolffish in Icelandic waters is caught as bycatch in the bottom trawl and longline fisheries<br>• Interactions between the fisheries under assessment and the following: basking sharks and leafscale gulper sharks<br>• Total catch in numbers of Grey skate (*Dipturus flossada*) for the latest available MFRI survey<br>• Catches of Atlantic halibut<br>• Status of Greenland shark and spiny dogfish<br>• Interactions with Blue whales and Northern right whales<br>• New studies or report on Endangered, Threatened and Protected species interactions<br>• Long-liners bycatch reduction devices<br>• Marine mammal and seabird bycatch in the lumpsucker fishery<br>• Bycatch rate in inspector trips was around four times higher than reported by the fleet in 2017<br>• Bycatch reported in other fisheries (e.g. longliners, gillnetters, bottom trawlers)<br>• Harbour porpoise updates, status and management,<br>• Management objectives set for grey seals<br>• Bycatch recording smartphone app in development by the Directorate of Fisheries<br>• Mortality/survival rate of released marine birds and marine mammals<br>• 2018 towed bottom-fishing gears effort<br>• Bycatch of sponges<br>• Collection of information on non target, non commercial species (e.g. starfish, jellyfish, crabs, tunicates, bivalves, etc..) during the yearly MFRI surveys<br>• Hydrothermal vent chimney areas in Eyjafjord and Southeast Coral closures<br>• Mapping the distribution of benthic assemblages and habitats which are considered to be sensitive to trawling disturbances<br>• Multi-species stock assessment/ecosystem based management. Applicability |

  

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|---|---|---|
| Tuesday 27th of November 2018 | 13.00 Fisheries Directorate<br>Þorsteinn Hilmarsson,<br>Head of Services and information<br>Sævar Guðmundsson<br>Department Manager<br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Differences on organization, responsibilities, legislation<br>• Changes in technical measures and effort controls<br>• Catch versus TAC for 2017/2018 season. TAC allocation for 2018/2019 season. Deviation from TAC<br>• Current arrangements in terms of quota flexibility<br>• Analysis carried out with the aim of detecting deviations that may occur between actual total catch and TAC<br>• Average inspector coverage % on trawlers, longliners and gillnetters<br>• Shore based monitoring by Directorate's staff<br>• New gear restrictions/technical measures applicable<br>• Short term closures (e.g. 2 week closures) implemented in Icelandic waters to protect juveniles of cod, haddock, saithe and redfish<br>• Closure of coastal areas to bottom trawls<br>• Role of inspectors on board of Icelandic fishing vessels<br>• Changes to the legal and administrative system to improve recording of non-commercial by-catch<br>• Compliance of fishermen recording of such interactions changed in recent years<br>• Use of gear modification to prevent encounters with seabirds<br>• Enforcement of, and levels of compliance with, logbook reporting of interactions/bycatch between seabirds and marine mammal<br>• Smartphone app in development by the Directorate of Fisheries, to improve reporting and identification of bycatch<br>• Rules and regulations around marking of static gear and avoid potential gear loss/ghost fishing<br>• Additional considerations or plans for additional coral *Lophelia pertusa* closures in Icelandic waters. |
| Tuesday 27th of November 2018 | 15.00 Fish Auction<br>Örn Smárason<br>Branch Manager<br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • How catches are reported electronically and sold through the Auction system<br>• System in place to track purchase and sale of fish<br>• Selling the juvenile portion of catches<br>• Treatment of species under species ban in relation to discard ban.<br>• Marketable species, changed in recent years |
| Wednesday 28th of November 2018 | 10.00 Coastguard<br>Auðunn F. Kristinsson<br>Project manager,<br>Icelandic Coast Guard | • Enforcement Laws and Regulations. Have there been important amendments or changes to the Icelandic enforcement laws? |

  

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|---|---|---|
| | SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Type of vessels boarded (Gears: Trawl, longline, gillnet etc. and Vessel type: wetfish, freezer trawler, small boat etc.). Foreign vessels boarded.<br>• Boardings rate and type/ number of violations recorded<br>• Most commonly occurring violations<br>• Airborne fisheries patrol hours conducted over the last fishing season<br>• Level of resources and monitoring effort<br>• Prosecutions and reprimands made against skippers<br>• Violations of fishermen fishing over their TAC<br>• Changes in violation/compliance rate<br>• What is checked when the vessels are boarded (gear, catch composition)<br>• Changes to the range of monetary and operational penalties for serious infractions to fisheries regulations<br>• Any instances of IUU fishing by Icelandic or foreign vessels<br>• Enforcement of, and levels of compliance with, logbook reporting of interactions/bycatch between seabirds and marine mammal. Any prosecutions for failing to report? Any changes from previous years? |
| Wednesday 28th of November 2018 | 13.00 HB Grandi hf<br>Torfi Þorsteinsson<br>General Manager - Groundfish<br>Ingimundur Ingimundarson,<br>Pelagic Fleet Manager<br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Updates on HB Grandi's efforts towards fisheries and environmental sustainability<br>• Percentage of catches do HB Grandi's trawlers take on average as a proportion of total catches for the species under assessment<br>• The MFRI 2017 Advice on harbour seals mentions that 86 harbour seals were estimated to have been caught in bottom trawls in 2015. Relevance to HB Grandi's fleet<br>• Technical or management measures are there in place to minimise bycatch and interactions between trawl vessels and marine mammals and seabirds<br>• Measures are there in place to improve fishing selectivity of target species and to exclude/minimise non target catches<br>• Measures are in use by trawl vessels to minimize the impacts of bottom trawl gear on the seabed and sensitive habitats |
| Wednesday 28th of November 2018 | 14.30 Kristján Þórarinsson<br>Fisheries Iceland<br>Finnur Garðarsson<br>Iceland Responsible Fisheries Foundation (IRFF)<br><br>SAIG Assessment Team:<br>Vito Romito | • Brief review of the 2017/2018 cod, haddock, saithe and golden redfish fishing seasons. Key issues or updates etc.<br>• Any recent changes in the management system, key laws or regulations<br>• Any key changes to management of small boat coastal fisheries or allocations<br>• Plans for revisiting/updating Fishery Management Plans<br>• Updates on the Iceland Responsible Fisheries Programme. |

| | | |
|---|---|---|
| | Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Fisheries interactions with marine mammals and seabirds recording and management efforts. Recent improvements, issues and updates<br>• Initiatives to improve the fishing industry in Iceland and promote the utilisation of a greater proportion of catches<br>• Interactions between small vessels and larges vessels. Recent improvements, issues and updates |
| Thursday 29th of November 2018 | 10.00 BirdLife International<br>Erpur Snær Hanssen<br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Birdlife International work/projects in Iceland<br>• Icelandic fisheries (especially longliners and gillnetters) interactions with seabirds<br>• Long-liners in Iceland reportedly use protective devices to shield baited hooks as gears are shot in order to prevent encounters with seabirds. Use of such practices (e.g. tori lines, night settings, acoustic devices) or equivalent practices within the industry<br>• Other measures in place to improve fishing selectivity of target species and to exclude/minimise non target catches and interactions<br>• Interaction between the fisheries under assessment and ETP seabird species<br>• New projects, studies or other relevant updates |
| Thursday 29th of November 2018 | 11.00 Vísir hf.<br>Pétur Pálsson, General Manager<br>Erla Pétursdóttir<br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Updates on Visir HF efforts toward fisheries and environmental sustainability<br>• Percentage of catches Visir HF longliners take on average as a proportion of total catches for the species under assessment<br>• Long-liners are reported to use protective devices to shield baited hooks as gears are shot in order to prevent encounters with seabirds. Are there specific regulations for the use of use mitigation measures on longline fisheries (e.g. tori lines, night settings, acoustic devices) or equivalent practices?<br>• What other management measures (e.g. communication, move away from hotspot type rules) are there in place to minimise interactions between longliners and marine mammals and seabirds<br>• What measures are there in place to improve fishing selectivity of target species and to exclude/minimise non target catches<br>• To what extent are such bycatch reduction devices / practices used in the fisheries under assessment by industry |

| | | |
|---|---|---|
| Thursday 29th of November 2018 | 13.00 The Client (closing meeting)<br>Kristján Þórarinsson, Fisheries Iceland<br>Axel Helgason NASBO<br><br>SAIG Assessment Team:<br>Vito Romito<br>Conor Donnelly<br>Dankert Skagen<br>Gisli Svan Einarsson | • Summary of people met<br>• Key findings from various stakeholders<br>• Issues about marine mammals and seabird bycatch recording in logbooks<br>• Assessment timelines for redfish, cod, haddock and saithe |

# 8. Section 8 Assessment Outcome Summary

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

Iceland has a structured management system that covers all commercial species. There is a principal Act *(*Lög um stjórn fiskveiða, nr. 116; 10. August 2006*)* and a number of supporting Acts and Regulations for the management of the fishery. The Ministry of Industries and Innovation is the principal management body responsible for Icelandic fisheries. The Directorate of Fisheries is responsible for the implementation of Fishery Regulations on behalf of the Ministry. The Icelandic Coast Guard performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters and monitoring of fishing within the zone in consultation with the Marine and Freshwater Research Institute and Directorate of Fisheries. The Marine and Freshwater Research Institute conducts a wide range of marine research and provides the Ministry with scientific advice.

The management strategy objective for Icelandic commercial fish stocks in general, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term. The key element in the management is output control through a total allowable catch (TAC) that is distributed on the participating vessels by an ITQ system.

There is a suite of monitoring and control measures in place to keep catches in conformity with allowed amounts, including control at sea by the Coast Guard, temporal and permanent area closures, obligation to land in designated ports where the catch is weighed by authorized weighers, strict control with vessel quotas by the Directorate, an obligation to land undersized fish for a reduced price and technical regulations including a minimum mesh size in bottom trawls. Legal gears do not include dynamiting, poisoning and other comparable destructive fishing practices.

Digital tools for publication allow almost real-time publishing of results and decisions, including results of stock assessments, MFRI advice and catches and quota status even for individual vessels. Interested parties participate in decisions processes through regular meetings between industry and management. Conflicts between vessels may be prevented by the Icelandic Maritime Traffic Service which is a single point of contact for all maritime related notifications. The Ministry can close areas for certain gears if necessary.

The management of cod is part of the general fisheries management in Iceland, and rules and regulations that apply in general apply to cod as well. Some elements are specific to cod, in particular the harvest rule. Taken together, the set of rules and regulations and institutional infrastructure can be regarded as a fisheries management plan. The elements are in place, documented and publicly available.

The unit managed by Icelandic authorities is cod in Icelandic waters. The relevant stock of cod is confined to Icelandic waters and managed by national authorities.

The management strategy objective to maintain the exploitation rate at the rate which is consistent with the precautionary approach and that generates maximum sustainable yield (MSY) in the long term, is achieved primarily by setting quotas according to a harvest rule. The rule states a fixed harvest rate as a proxy for a target fishing mortality which is reduced if SSB is below a trigger value. There are limit values for SSB and fishing mortality defined, and simulations have demonstrated a low risk to exceed the limits and long-term average catches close to the MSY.

The quota regulations are supplemented by area closures, mesh size regulations, sorting grids in selected fisheries, discard ban and surveillance at sea and at landing sites.

In the past 5 years, catches of cod have exceeded quotas by an average of about 3.5% a year (range -2% to +6%), except in the fishing year 2016/17, where the total catch was slightly below the TAC. The main cause seems to be allowances for fishery outside the standard ITQ system, in particular for local, small scale fisheries. These arrangements are according to law. Additionally, the landing of juveniles as part the overall discard ban measures will contribute to a small percentage of landings above TAC.

**Clause 1.2 Research and assessment**

The Marine and Freshwater Research Institute (MFRI) is the main research institute in marine science in Iceland. Data collection for assessment purposes, both from the fishery and surveys, is performed by the MFRI, in cooperation with the Fisheries directorate. MFRI issues advice on individual stocks on the web yearly. The report from the underlying stock assessment and the ICES advice are readily accessible on the ICES website.

The cod stock is assessed using a forward running statistical catch-at-age model (ADCAM) fitted to catch numbers at age and indices at age from bottom trawl surveys in the spring and in the autumn. The assessment method has developed since 2002, and was last reviewed and endorsed by ICES in 2015. A revision is planned in 2021.

Landings data are provided by the Fisheries Directorate. Age distributions and weights and maturities at age are obtained from samples taken by MFRI from catches and in surveys. The surveys are extensive and cover the whole Icelandic shelf. The data are considered adequate for the assessment method. Data on individual growth and maturity is obtained from samples of the commercial and survey catches. Each annual recruitment is estimated as a separate parameter, there is no stock recruitment relation assumed. The recruitment has largely been independent of the SSB, but there was a reduction in recruitment in the mid 1990ies independent of SSB. Natural mortality has assumed values.

Discards is prohibited. Discards for cod are to some extent estimated and are small. Unobserved and incidental mortality is covered by the assumed natural mortality. The value for that is just assumed at a level that is regarded as sensible for most gadoids, including cod. The strict control with landings by the Directorate and detailed monitoring of fishing operations by the Coast Guard should make black landings very unlikely.

There is close communication between scientists and the fishing industry, both in formal meetings and through informal contact. There are specific consultation groups between fishermen and the MRFI that meet annually in December allowing fishermen (captains) to describe the fishing experience of the year and make comparisons with those previously. Log-books is compulsory. Their information is not used directly in the stock assessment but is important background material for both managers and scientists.

Iceland is member of ICES, which is a key forum for scientific and management activities and cooperation. Iceland has cooperation with several international organisations, in particular NEAFC and NAFO. Furthermore, the Icelandic government has cooperation agreements with Norway, Russia, Greenland, EU and The Faroe Islands.

The cod in ICES Division 5a (Icelandic waters) is regarded as a separate stock and managed as such by Iceland. Stock assessment and evaluation of the management plan, is done in cooperation between interested nations within the NWWG in ICES.

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

The precautionary approach is implemented through a harvest rule that implies low risk of stock depletion. ICES has defined a limit SSB (Blim) at 125000 tonnes, which is considered to be sufficient for normal recruitment. The harvest rule was tested by simulation, taking the relevant sources of uncertainty into account. The simulations were done as a bootstrap simulation, where all relevant uncertainties were represented by distributions, based on the experience with stock dynamics and assessment performance. This procedure is the standard way of evaluating harvest rules in ICES and elsewhere. The harvest rule was found to be in accordance with the precautionary approach, according to the rules practised by ICES. The rule implies a low probability of bringing the stock below Blim.

ICES has defined reference points for Icelandic cod, that have been adopted by MFRI. The harvest rule prescribes a reduction in the harvest rate if SSB goes below a trigger value of 220 000 tonnes. With the current stock dynamics and harvest rule, this situation is unlikely. Further measures if SSB gets too low would depend on the reason why the SSB became reduced. The Icelandic management has the authority to take the necessary action.

The general long-term harvesting policy is stated by government of Iceland as: *The management strategy for Icelandic fish stocks, in general, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term.* This statement also appears as the objective of the management plan specific for cod. The harvest rule was designed to provide a near maximum long-term yield and a stock abundance safely away from the limit. The target fishing mortality is set on the low side of the plateau associated with maximum yield, which provides a buffer biomass against natural variations in productivity. It is also close to the exploitation that provides maximum economic yield.

The management target for the harvest rate is 0.2. A limit fishing mortality has been defined at F=0.74. Harvest rate is regarded as a proxy for fishing mortality. According to the rule, the target harvest rate shall be reduced if SSB in the assessment year is estimated below Btrigger = 220 000 tonnes. There is no explicit measures planned for the event that fishing mortality shall exceed the F limit. The limit is so high that reaching it when setting TACs according to the target is highly unlikely. A long-term target for the stock size is considered redundant as the harvest rule applies a fixed exploitation rate, and not defined. The procedure applied when setting reference points follows ICES standards and the results were accepted by ICES.

There is an extensive system of closures to protect both spawners at spawning time and juveniles. There is also a system for closing areas temporarily on short notice, if there appears too much juveniles in catches. Furthermore, there are mesh size regulations in place to protect juveniles; the standard mesh size in trawl is 135 mm, and fishing with trawls is prohibited in large areas near the coast which serve as spawning and nursery areas. Sorting grids in fishing gear are obligatory in certain fisheries to prevent catches of juvenile fish.

**Clause 1.4. External Scientific Review**

ICES is regarded as the relevant scientific body that organizes stock assessments and performs evaluations of management plans. The assessment as well as the management plan were revisited in 2015 and approved without changes. A re-evaluation of assessment methods and management plan is planned in 2021.

The Icelandic management authorities decide the harvesting policy, including the management plan. It takes advice form the MFRI as well as from the industry and fishermen. The MFRI advice generally follows the ICES advice unless there are strong reasons to deviate from it. Managers and MFRI will seek the advice from ICES when revising harvesting policy.

**Clause 1.5. Advice and Decisions on TAC**

The stock assessment and advice for the TAC in the coming year is provided annually by ICES. The MFRI provides advice to the Ministry, which is the competent fisheries management authority. The advice published by the MFRI has reference points tabulated. These are identical to the reference points defined by ICES and include the reference values in the harvest rule in the management plan.

The stock of cod in Iceland is confined to Icelandic waters, thus it is not a shared stock. The TAC for Iceland is set by the Ministry after advice from MFRI and consultations with the industry. The Ministry has the authority to deviate from the advice but will only do so if there are strong reasons for that. In practice, where harvest rules are in effect, the advice has been according to the rule and the TAC set according to the advice. The management of cod is part of the general fisheries management, stated in the suite of rules and regulations applicable to all commercial fisheries in Iceland.

The practical implementation of management decisions is the task of the Directorate, which is the executive body that organizes the ITQ system and monitors catches, the Coast guard which is responsible for surveillance and enforcement at sea and the MFRI which performs assessments and provides advice. There is a wide range of measures to ensure that the total catch is in accordance with the decided TAC. These include a landings obligation, catch reporting by independent, authorized personnel, and close monitoring of activities at sea. However, transfers of quotas between species and years, as well as special rules for the smallest boats, may lead to catches legally deviating from the set quotas. Iceland participates in other fisheries and non-fisheries organisations/arrangements in the North Atlantic region.

**Section 2 Summary**

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

An effective legal and administrative framework exists which is implemented by the Fisheries Directorate, part of the Ministry of Industries and Innovation. The Directorate works closely with the Coast Guard and Port Authorities. Key legislation underpinning the framework comprises the Fisheries Management Act (No. 116/2006), the Act on Fishing in Iceland's Exclusive Economic Zone (no. 79/1997) and the Act concerning the Treatment of Commercial Marine Fish Stocks (no. 57/1996). Together these provide the legal basis for the Icelandic Individual Transferable Quota (ITQ) system, establish allocation harvest rights and permit requirements for all participating commercial fishing vessels, prohibit discarding of commercial fish, grant powers to implement closures for juvenile fish, put in place strict controls regarding the recording of catch and the landing and weighing of fish and establish penalties for violation of the provisions of these Acts and associated Regulations, amongst other things. The system incorporates several important measures to enable flexibility which encourages compliance with the law whilst ensuring sustainable use of the resource. Effective mechanisms for monitoring, surveillance, control and enforcement exist involving at-sea and land-based monitoring of fishing activity, catches and landings by the Coast Guard and Fisheries Directorate Inspectors, supported by Port Authorities. Offences are recorded, and enforcement action is taken, this largely comprises administrative penalties ranging from guidance letters and reprimands to suspension of fishing permits and weighing licenses. More serious cases are sent to the police for prosecution under the criminal system which can result in imprisonment.

**Clause 2.2 Concordance between actual catch and allowable catch**

Landings must be recorded in logbooks at sea and these are verified and standardised through physical weighing at accredited weigh stations in landings ports throughout Iceland. Registered weights for each landing are sent to the Fisheries Directorate, recorded on their catch registration database (GAFL), and the appropriate amount is subtracted from the vessels quota. ITQ transfers are also monitored to ensure that vessels either have or source sufficient quota to cover the entirety of their catch within 3 days of landing. Compliance is checked through at-sea and on-land monitoring by the Coast Guard and Fisheries Directorate inspectors with enforcement action taken where non-compliance occurs (detailed in clause 2.1.1). However, landings are consistently higher than the TAC set by the Ministry. Corrective management measures and/or appropriate adjustments in management decisions are implemented when the need is indicated by the relevant information. Nevertheless, the total catch of cod, often exceeds the TAC by a relatively small percentage. In the past 5 years, catches of cod have exceeded quotas by an average of about 3.5% a year (range -2% to +6%), except in the fishing year 2016/17, where the total catch was slightly below the TAC. The main cause seems to be allowances for fishery outside the standard ITQ system, in particular for local, small scale fisheries. Additionally, the landing of juveniles as part the overall discard ban measures will contribute to a small percentage of landings above TAC. These arrangements are according to law.

Participating companies must ensure that they have been issued with all required permits; operate in compliance with the relevant rules and regulations; and limit the catches of their vessels in accordance with their catch quota. These are legal requirements which are monitored by the Fisheries Directorate, Coastguard and Port Authorities and enforcement action taken.

**Clause 2.3 Monitoring and Control**

**Clause 2.3.1. Vessel Registration and catch quotas**

As the share of the TAC allocated to vessels is based on the number of shares for that particular species that the vessel owns, the overall value of quota allocated cannot exceed the TAC set by the Icelandic authorities. Within fishing seasons additional inter-annual, inter-species and/or inter-vessel transfers may cause the amount a particular vessel is allowed to catch to increase or decrease.

Commercial vessels participating in the fishery require a permit issued by the Fisheries Directorate. Permits are only granted to fishing vessels holding certificates of seaworthiness and registered in the Registry of Vessels. The Fisheries Directorate maintain a catch registration system (GAFL database) which is updated with information on registered catches 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.

**Clause 2.3.2 Fishing vessel monitoring and control systems**

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. It involves several different but complementary electronic vessel monitoring systems including satellite-based systems, comprising VMS and use of satellite imagery, the monitoring of coastal activity through a dedicated land-based very high frequency (VHF) system and the use of the Automatic Identification System (AIS). The integrated system

uses all available data such as identification of the vessel, its movements, IUU (illegal, unreported and unregulated) lists, notifications, reports, fishing licenses, permits, port State control reports, etc. to detect and prevent unauthorised fishing in the Icelandic Exclusive Economic Zone (EEZ) and the North Atlantic Ocean.

Unannounced at-sea inspections, which cover fishing gear, composition of the catch, correct recording of catch in logbooks amongst other things, are undertaken during boardings by the Coast Guard and on fishing trips accompanied by the inspectors of the Fisheries Directorate. The Directorate's inspectors also undertake unannounced in-port inspections. Surveillance is strategic and risk-based, using information supplied by the Fisheries Directorate to identify highest risk activities where monitoring effort is then concentrated, for example, at present on the gillnet fisheries.

VMS is used by the Coastguard to enforce temporary and long-term fisheries closures. Catch amounts by species and fishing area are estimated and continually recorded in fishing logbooks on-board fishing vessels and these data are provided to the competent authorities either by fishing event or fishing trip depending on the size of the vessel.

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. The Assessment Team issued a Minor Non-conformance during the 4$^{th}$ Surveillance activities and received corrective action evidence during this re-assessment.

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

The law requires that all catches by Icelandic vessels from Icelandic waters must be landed and weighed in an Icelandic port. Weighing is undertaken on official port scales, or on other approved scales at private companies or Fish Markets, that have been certified by the Fisheries Directorate and operated by individuals authorised by the Directorate. The Fisheries Directorate maintains a list on their website, organised by port, of all official weighing license holders that they audit, and the type of weighing license held. Within two hours of landing, all commercial species caught, both target and by-catch, must be officially separated and declared by logbook and landed weight. New powers have been enacted through legislation to address the risk posed by incorrect weighing of ice. Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines.

**Clause 2.3.3. Catches are subtracted from relevant quotas**

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

sea catch is also monitored, including its conversion to live weights which are then deducted from the vessel's quota.

Some flexibility occurs in the quota management system so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels and to discourage discarding. This is facilitated by a number of provisions including the ability to use a limited amount of the following season's quota or to transfer a limited amount of unused quota to the following season, or transfer quota between species using 'cod-equivalents'. Where a vessel has exhausted these options, it must transfer quota from other vessels and if unable to do this it must stop fishing.

**Clause 2.3.4. Rules are enforced**

There is a clearly established legal framework which sets out rules and regulations relating to fishing activity within Icelandic waters and the penalties for violation of these rules. It gives powers to the Ministry, the Fisheries Directorate, the Coast Guard and the MFRI to monitor fishing activities and enforce these rules. Penalties exist for serious infractions. This largely comprises administrative penalties ranging from guidance letters and reprimands to suspension of fishing permits and weighing licenses. More serious cases are sent to the police for prosecution under the criminal system which can result in imprisonment

**Clause 2.3.5. Analysis is carried out**

Analysis is carried out with the aim of detecting any deviations that may occur of the actual total catch from the Total Allowable Catch (TAC). Measures are available and are adopted when indicated. All processors purchasing fish, be it directly or at auction, are obliged to submit monthly reports to the Directorate. In addition, the fish auction reports all sales of fish directly to the Directorate. Analysis of catches includes the comparison of reported catches with the amount of sold or exported products to verify independently that 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.

**Section 3 Ecosystem Considerations**

**Clause 3.1. Guiding Principle**

The main priorities of the MFRI are research on marine and freshwater ecosystems in Iceland and sustainable exploitation of main stocks, ecosystem approach to fisheries management, research on fishing technology and seafloor and habitat mapping. Since the Icelandic groundfish fishery is multispecies in nature with vessels simultaneously targeting numerous species, habitat and bycatch effects are generally attributed to the fishery as a whole rather than to any species in particular.

Most commercially fished species in Iceland, target or non-target, are now part of the ITQ system and as such they are retained and accounted for within the catch accounting system operated by Fiskistofa. Discarding is prohibited. There are vulnerable and /or Endangered, Threatened and Protected (ETP) species occurring in Icelandic waters. The fishery does not appear to have significant effects on most bycatch or on ETP species. However, a minor non-conformance has been issued relating to spotted wolffish and common loon bycatch. The Client Group has provided a Corrective Action Plan.

E-logbooks recording of all marine mammals and seabirds catches (by species and numbers) is a legal requirement (Reg. 126/2014). A smartphone app is in development by the Directorate of Fisheries to make both reporting and identification of bycatch easier for operators in the fishery.

Interactions between fishing gears and the seabed are highly dependent on gear type with towed bottom gears such as demersal trawls and dredges having a greater impact than static gear such as longlines, set nets or pots. The 2017 ICES Report on the Icelandic Ecoregion Ecosystem highlights that based on analysis of electronic logbook data a total area of about 79 000 $km^2$ was fished with towed bottom-fishing gears in 2013 in Iceland, composing 10% of the ecoregion.

Large areas within the Icelandic EEZ are closed, either temporarily or permanently, to fishing for a variety of reasons; these include the protection of juveniles, spawning fish and VMEs such as coral and hydrothermal vents. Cumulatively, a large portion of Icelandic shelf area within which fishing activities occur is closed to bottom trawling.

**Clause 3.2.1. Information gathering and advice**

Information is available on the legal specification of fishing gear in the Icelandic groundfish fishery. The primary aim of fishing gear regulations is size selectivity with a secondary aim being species selectivity. Gears are regulated in several ways to regulate both size and species selectivity. The MFRI provide advice for 40 fish stocks in Iceland as well as advice for harvest of marine mammal species (e.g. fin whale and common minke whale). Their most recent advice, which include routine monitoring and assessment efforts is available online.

**Clause 3.2.2. By-catch and discards**

According to section 2 of Act no. 57/1996, concerning the treatment of commercial marine stocks, discard of catches (although with minor exceptions) is prohibited. Discarding violations are subject to penalty ranging from ISK 400K to 8M.

There are technical measures/mechanisms in place in Icelandic longliners to mitigate adverse impacts on seabirds. These include the use of acoustic cannons, balloons towed at the end of the vessel to scare-off of diving birds, and night settings to minimise interactions with seabirds. Pingers are being trialled in the cod gillnet fishery to avoid marine mammal bycatch.

There are a number of initiatives and regulations in place to avoid the loss of fishing gear and subsequent ghost fishing of lost and abandoned gear. Where Fiskistofa finds and recovers lost or abandoned gear they recover the cost of recovery from the gears' owner. The directorate confirmed that gear loss (e.g. longlines, gillnets) and ghost fishing is not considered an issue and that reporting lost gear is compulsory. Additionally, the Icelandic ITQ system operates in such a way (i.e. not Olympic) that gear losses are minimised.

**Clause 3.2.3 – Habitat Considerations**

Large areas within the Icelandic EEZ are closed for fishing, either temporarily or permanently. These closures are aimed at protecting juveniles and spawning fish and protecting vulnerable marine ecosystems. Furthermore, the Icelandic government has closed 10 areas in South East Iceland where significant coral cover has been identified

through scientific research. There are two known hydrothermal vent areas with series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island and are fully protected by environmental law no. 249/2001 and 510/2007.

**Clause 3.2.4. Food web Considerations**

In the waters to the north and east of Iceland, available information suggests the existence of a simple bottom-up controlled food chain from phytoplankton through *Calanus spp.*, capelin and to cod. Less is known about the structure of the more complex southern part of the ecosystem.

Cod is an opportunistic predator that forages mainly at dawn and dusk. Larvae feed mainly on zooplankton while juveniles prey predominantly on benthic crustaceans; adults feed mainly on zoobenthos and fish including juvenile cod. Fish prey becomes more common in the diet with increasing body size. Adults may cover large distances during the feeding period. Young cod are also preyed upon by different fish species and octopus. Adult cod are prey items of top predators like sharks, rays, whales, dolphins, seals, and sea birds.

**Clause 3.2.5. Precautionary Considerations**

Icelandic government policy aims to protect vulnerable marine ecosystems from significant adverse impact from bottom contacting gear and legislation exists to provide for the prohibition of fishing activities with bottom-contacting gear in areas where vulnerable ecosystems occur. MFRI Advice includes a specific section on the ecosystem impacts of Icelandic fisheries. Measures to minimize or mitigate ecosystem issues identified include technical measures such as the use of night settings, trailing balloons, scare lines and weighted lines in longline fisheries, the trial of bycatch reduction devices in gillnet fisheries, the use of flying doors and rock hoppers on bottom trawlers, and real time, temporary and permanent areal closures.

# 9. Conformity statement

**The assessment team recommends that the management system of the applicant fishery, the Icelandic cod (*Gadus morhua*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by demersal trawl, long-line, gill net, Danish seine net, (and hook and line by small vessel gear) and indirectly by Nephrops trawls, shrimp trawls, pelagic trawls and purse seines within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), be granted re-certification to the Icelandic Responsible Fisheries Certification Programme.**

# 10. Fishery Assessment Evidence

## 10.1. Section 1: Fishery Management

### 10.1.1. Clause 1.1. Fisheries Management System and Plan for Stock Assessment, Research, Advice and Harvest Controls

### The Fisheries Management System

#### 10.1.1.1. Clause 1.1.1.

A structured fisheries management system shall be adopted and implemented.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Iceland has a structured management system that covers all commercial species. There is a principal Act (Lög um stjórn fiskveiða, nr. 116; 10. August 2006) and a number of supporting Acts and Regulations for the management of the fishery. The Ministry of Industries and Innovation is the principal management body responsible for Icelandic fisheries.**

**Evidence:**

Iceland has a structured management system covering all commercial species, including cod and an established Marine Policy[42].

**Legislation.** There is a principal Act (Lög um stjórn fiskveiða, No 116/2006) and a number of supporting Acts and Regulations for the management of the fishery[43]. 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.* Policies incorporate a number of International Agreements and declarations, including; UN Convention of the Law of the Sea,[44] Agenda 21 of the Rio Declaration[45], FAO Code of Conduct for Responsible Fisheries and the International Plan of Action to prevent, deter and eliminate Illegal, Unregulated and Unreported Fishing.

**Institutions.** There are a number of inter-related government agencies within the system under the direction of the Ministry of Industries and Innovation which has ultimate responsibility.

**The Ministry of Industries and Innovation[46]** in Iceland is the principal management organization responsible for Icelandic fisheries and has the ultimate responsibility for fisheries management. The Ministry acts according to law issued by the parliament (Althingi), and according to advice from the Marine and Freshwater Research Institute (MFRI). The Ministry of Industries and Innovation opened on 1 September 2012 following the amalgamation of the Ministry of Fisheries and Agriculture, the Ministry of Industry, Energy and Tourism and part of the Ministry of Economic Affairs. Hence, it now covers all sectors of ordinary business and economic activity. Two ministers share the responsibilities, one for fisheries and agriculture and one for tourism, industry and innovation. The organisational chart is shown below (Figure 15).

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

43 An updated collection (in Icelandic) is issued yearly at http://vefbirting.oddi.is/raduneyti/fiskveidar2018/

44 Ratified 1985: https://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm

45 http://www.un.org/documents/ga/conf151/aconf15126-4.htm

46 https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2019/09/13/Stjorn-fiskveida-2019-2020-Log-og-reglugerdir/

The Ministry of Industries and Innovation is responsible for setting annual total allowable catch. It takes advice from the Marine Research Institute as well as in consultation with stakeholders.

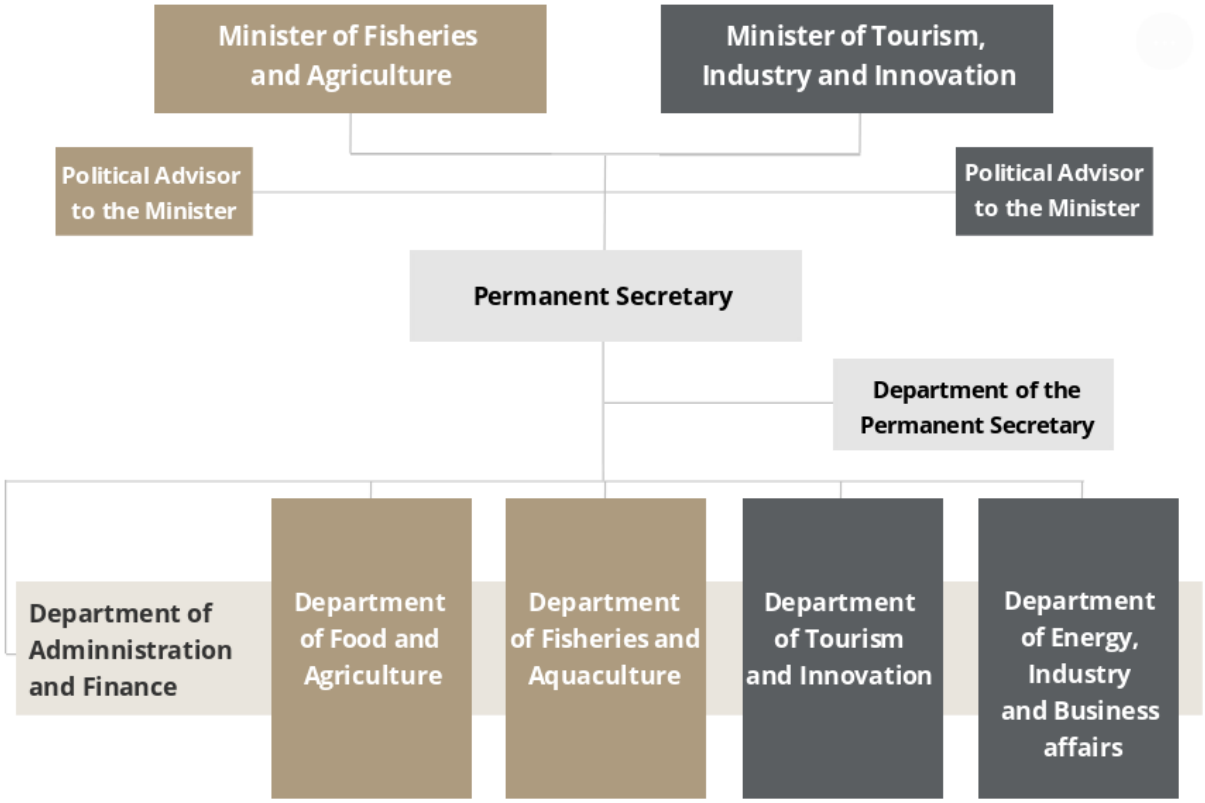



**Figure 15.** Organisational chart of the Ministry of Industry and innovation.

The executive body is the **Fisheries Directorate (Fiskistofa)**[47] . The Directorate allocates annual catch quotas to each vessel by distributing the total allowable catch according to the quota shares attached to each vessel. The individually transferable quota shares and catch quotas are the cornerstone of the Icelandic fisheries management system. In addition to the individually transferable quota system, Icelandic fisheries management includes management measures such as fishing gear restrictions, area restrictions including the use of closed areas and port control and weighing of all catches. The Directorate of Fisheries is responsible for the daily administration of these measures.

**The Icelandic Coast Guard (ICG)**[48] is responsible for control at sea, both of the catches and the quality of the vessels. It is a civilian law enforcement agency that is responsible for search and rescue, maritime safety and security surveillance[49], and law enforcement in the seas surrounding Iceland. The Icelandic Coast Guard performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters and monitoring of fishing within the zone.

47 http://www.fiskistofa.is/english
48 http://www.lhg.is/english
49 http://www.lhg.is/media/leit_og_bjorgun/RESCUE_EN.pdf

The ICG's duties include protection against illegal activities such as illegal migration and illegal drug tracking, fisheries control and enforcement, pollution surveillance and response, natural resource and ecology protection, and salvage and rescue diving. The ICG operates the NATO Iceland Air Defense System and CRC Keflavík and is responsible for Explosive Ordnance Disposal (EOD) in Iceland, hydrographic surveying and nautical charting. It also provides emergency medical transport, assistance to law enforcement on land, and civil protection. The Icelandic Coast Guard operates rescue helicopters, offshore patrol vessels, coastal vessels, and a maritime surveillance aircraft. The ICG's vessels, maritime surveillance aircraft and helicopters are designed and equipped to ensure a rapid response in crisis situations, including rescuing individuals from danger at sea or on land, providing urgent medical transport and assisting boats and ships within the country's jurisdiction.

The **Marine and Freshwater Research Institute (MFRI)**[50] conducts a wide range of marine research and now provides the Ministry with scientific advice as MRI did previously. MFRI was established on July 1, 2016 as a result of a merger of two inveterate Icelandic research institutes, the Institute of Freshwater Fisheries (founded in 1946), and the Marine Research Institute (founded in 1965).[51] The MFRI is responsible for fish stock assessment and scientific advice, and for obtaining the necessary information for that task, in particular sampling of catches, scientific surveys and providing scientific background for advice. MFRI also has the authority to manage short term area closures, which are used extensively to protect juveniles and spawning fish.

The MFRI has two research vessels Árni Friðriksson (LOA 69.9 m) and Bjarni Sæmundsson (LOA 56 m). The former, delivered in 2000, is a modern multi-purpose research vessel designed for fisheries and oceanographic research, principally in the North Atlantic Ocean, temperate and arctic water, and equipped to modern standards for a marine research vessel.

MFRI has wide international cooperation in all major fields of marine science, as indicated by its publication record[52].

| | |
|---|---|
| **References:** | Refer to footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

50 https://www.hafogvatn.is/en
51 http://www.althingi.is/lagas/nuna/2015112.html
52 http://www.hafro.is/undir_eng.php?ID=20&REF=3

### 10.1.1.2. Clause 1.1.2.

The fisheries management system objective shall be to limit the total annual catch from the fish stocks so that catches are in conformity with amounts allowed by the competent authorities.

| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
|---|---|---|---|---|
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The management strategy objective for Icelandic commercial fish stocks in general, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term. The key element in the management is output control through a total allowable catch (TAC) that is distributed on the participating vessels by an ITQ system. There is a suite of monitoring and control measures in place to keep catches in conformity with allowed amounts, including control at sea by the Coast Guard, temporal and permanent area closures, obligation to land in designated ports where the catch is weighed by authorized weighers, strict control with vessel quotas by the Directorate and an obligation to land undersized fish for a reduced price.**

**Evidence:**

Article 1 in the principal Act *(No 116/2006)* 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.*

The government web-pages have statements on the objectives of fisheries management in Iceland:[53]

*The management strategy for Icelandic fish stocks, in general, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term.*

Harvest Control Rules (HCR) are set by the managers of the fishery, in the case of Iceland by the Ministry and are based on knowledge on the state of the stock and take account of the managers objectives, the nature of the resource and uncertainties. The main aim HCRs is thus to:

- Decrease the risk of short-term interests influencing the level of exploitation.
- Ensure that the available information on the resource are used in the most rigorous manner.
- Long term sustainable yield.
- Ensure that stock is above save biological limits.
- Often (including for cod) include buffers on the amount of Catch/TAC change between fishing seasons.

The key element in the management of Iceland's commercial fish stocks, including cod, is output control through a total allowable catch (TAC) that is distributed on the participating vessels by an ITQ system. There is a suite of monitoring and control measures in place, to keep catches in conformity with allowed

53 https://www.government.is/news/article/?newsid=cf30e5ad-584f-11e8-9429-005056bc4d74

amounts[54]. Some aspects are further discussed in Clause 1.1.3, Clause 1.5.8 and in Section 2. The overall TAC is set according to a harvest control rule. There is some flexibility to transfer quotas between years and in some cases between species. A cod quota can be transferred to other species, but quotas on other species cannot be used to cover cod catches. Discards are prohibited by law. Commercial species, including cod can only be landed in designated ports, where they are weighed and reported by authorized personnel. No fish can be landed without being accounted against a quota. The quota status is strictly monitored and enforced by the Directorate. There are several arrangements in place to reduce the incentive for discarding and black landings, including control at sea by the Coast Guard, temporal and area closures and an obligation/opportunity to land undersized fish for a reduced price.

Nevertheless, the total catch of cod, often exceeds the TAC by a relatively small percentage. In the past 5 years, catches of cod have exceeded quotas by an average of about 3.5% a year (range -2% to +6%), except in the fishing year 2016/17, where the total catch was slightly below the TAC. The main cause seems to be allowances for fishery outside the standard ITQ system, in particular for local, small scale fisheries. Additionally, the landing of juveniles as part the overall discard ban measures will contribute to a small percentage of landings above TAC. These arrangements are according to law. The Assessment Team has issued a formal Recommendation to the client to consider this issue at the next management plan revision in 2021. This is discussed in more detail in Clause 1.5.8.

| | |
|---|---|
| **References:** | Please refer to the referenced footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

54 https://www.government.is/news/article/2018/05/15/Fisheries/

### 10.1.1.3. Clause 1.1.3.

Appropriate measures for the conservation and sustainable use of the "stock under consideration" shall be adopted and effectively implemented by the competent authorities.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The key measures for the conservation and sustainable use of the stock include quota regulations in a flexible ITQ system, landings control, discard ban, area closures and technical regulations.**

**The process of setting the TAC**

According to Icelandic legislation, the responsible authority is the Ministry, and the MFRI is the formal advisor (see Clause 1.1.1 and 1.5.1). ICES is consulted and provides useful feedback and support, but the task of setting a TAC is not outsourced to ICES. MFRI knows the stocks very well, takes part in the assessment with methods developed by them, and has a very high scientific standing. Normally, the MFRI agrees with what ICES concludes and provides its advice accordingly, but if ICES make errors, misunderstandings or unwise decisions, or if the stock develops in a way that was not foreseen, it is the MFRI's responsibility to provide the decision makers with their best advice. When harvest rules have been established, the Ministry recognizes an obligation to set the TAC accordingly. So far, there are no examples of discarding the work and advice of ICES for stocks where harvest rules are in effect. Since the implementation of the FMP in 2010, the national TAC for cod has been set in line with scientific advice, although small catches by foreign vessels have not been subtracted in all years.

**Quota regulation**

The main tool for conservation and sustainable use of the fish resources in Iceland, including the cod stock, is output control in terms of quotas. In addition, there are technical measures, a general discard ban and area closures to support the sustainable use of the resource. There are special quotas for small scale fisheries to support local communities within the quota framework, and arrangements to reduce the incentive for discarding.

All commercial fishing operations are subject to a permit from the Directorate of Fisheries. On average, about 1300 vessels and boats are licensed for commercial fishing. In addition to general fishing permits, special licenses are issued for specified catches, e.g. for fishing on lumpfish and for fishing with seine. 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[55]. The general fishing permit with catch quota sets quotas by species for each vessel, and allows for buying and selling quotas to ensure that the vessel always has quota coverage for the species they catch. The hook and line quota is only available for small vessels less than 15 gross tonnage (GT). Within the hook and line system the vessels can freely transfer the quota between species, but they are only allowed to fish with handlines or longlines. This hook-and-line catch quota system is essentially an effort regulation for small scale fisheries. There are also arrangements with community quotas to support selected local communities. In addition an amount is allocated outside the general quota system for a local inshore fishery for vessels that do not have an ordinary quota (strandveiðar). The amounts permitted to catch in this fishery is strictly regulated is time and place, the vessels need a license from the

[55] https://www.sciencedirect.com/science/article/pii/S0308597X16302238

Directorate and have to land their catches in authorized ports. A vessel may only hold one type of fishing permit each fishing year. A commercial fishing permit shall be cancelled if a fishing vessel has not been fishing commercially for 12 months.

An overall national quota is set by the Ministry according to a harvest rule in a management plan that is in place for cod. The current plan was introduced in 2009, examined and approved by ICES in 2010[56], and revisited in 2015[57]. The plan is publicly available[58]. The history of harvest rules for Icelandic cod goes back to 1976 and almost similar rules have been in effect since the 1995/1996 season. The harvest rule is applied to estimates of stock abundance from a stock assessment. The assessment is made by the North-Western Working Group (NWWG) in ICES, where all involved nations participate. ICES formulate an advice based on the harvest rule and the result of the assessment. This advice is taken over by MFRI, modified and extended if necessary and presented as the scientific advice to the Ministry. The Ministry bases its decisions on annual total allowable catch on the recommendations of the MFRI as well as consultation with stakeholders [59].

After setting aside amounts for fisheries outside the ordinary quota system (4th and 5th bullet point below), the overall quota is distributed on individual vessels in an ITQ (Individual Vessel Quota) system that is organized and managed by the Directorate of fisheries.

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). The main elements are:

- Each vessel is assigned a quota share (%) in each stock, initially based primarily on catch history over a reference period.
- The annual allowable catch for each vessel from each stock is obtained by multiplying the TAC of the year and the vessel's quota share (as a proportion).
- Quotas can be transferred between vessels; this applies both to quota shares and annual catch allotments, and in some cases between species. Quota transfer is mainly intended to promote rationalisation and thus increase profitability in the industry.
- To reduce the incentive for high-grading, undersized fish that is caught (< 55 cm for cod) has to be sold. Only part of the catch is subtracted from the quota. The fisher gets a strongly reduced price and the surplus goes to a fund to promote scientific work of the MFRI.
- A coastal fishery is permitted under quotas aside from the ITQ system: Coastal fishing allocations are[60] not based on vessels' quota share; have a limited amount and have a series of applicable provisions[61]. These are designed to support local communities.

56 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2010/Special%20Requests/Icelandic%20cod%20management%20plan.pdf

57 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKICE%202015/wkice_2015_final.pdf

58 https://www.government.is/news/article/?newsid=cf30e5ad-584f-11e8-9429-005056bc4d74

59 http://www.fiskistofa.is/english/fisheries-management/

60 http://www.fiskistofa.is/veidar/aflaheimildir/byggdakvoti/

61 http://www.fiskistofa.is/fiskveidistjorn/umfiskveidistjornunarkerfid/strandveidar/

There are limitations to the permitted quota share for individual owners. Altogether, there is strong emphasis on making the system flexible and to reduce incentives for violations, while maintaining viable local communities and a firm control.

Under Icelandic ITQ system, no fish can be landed without a quota. If a vessel gets fish for which it does not have a quota, it has to buy one, and there is strict control by the Directorate that this is done. There is an efficient system for buying and selling quotas on-line, and for boat owners, trading quotas is a way to optimize their quota portfolio and operations. The quotas for all vessels are listed by the Directorate[62]

The efficiency of this quota system to limit landings to the overall TAC is discussed under Clause 1.5.8.

**Discard ban**

Discarding is prohibited[63] and is regularly monitored by comparing size distributions in self-reported catches and those taken by onboard Directorate inspectors; this method estimates high-grading, but not necessarily discarding for other reasons. The most recent estimates for discards of cod were 1.76% of landings by weight in the longline fishery and 2.43% (approximately 7% by numbers) in the trawl fishery. Both percentages, although low, are the highest in 10 years or more[64] (Figure 16). In the stock assessment, discards are considered negligible and are not included.

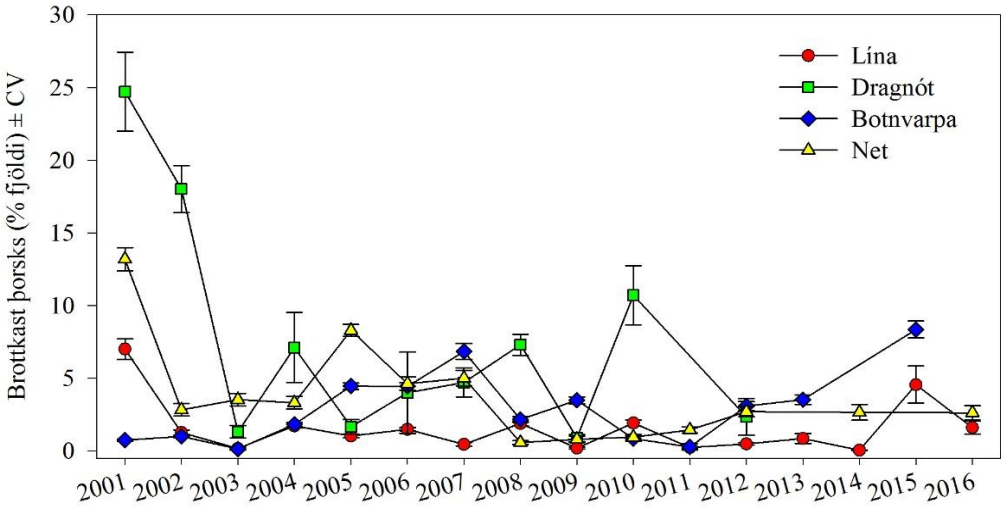



**Figure 16.** Discards of cod by gear type, in percent by numbers.

62 http://www.fiskistofa.is/veidar/aflaheimildir/uthlutadaflamark/

63 Act concerning the Treatment of Commercial Marine Stocks No. 57, 3 June 1996: https://www.althingi.is/lagas/nuna/1996057.html

64 Guðjón Már Sigurðsson & al. Mælingar á brottkasti þorsks og ýsu 2014-2015, available at: https://www.hafogvatn.is/is/midlun/utgafa/haf-og-vatnarannsoknir/maelingar-a-brottkasti-thorsks-og- ysu-2014-2015

**Landing and weighing**

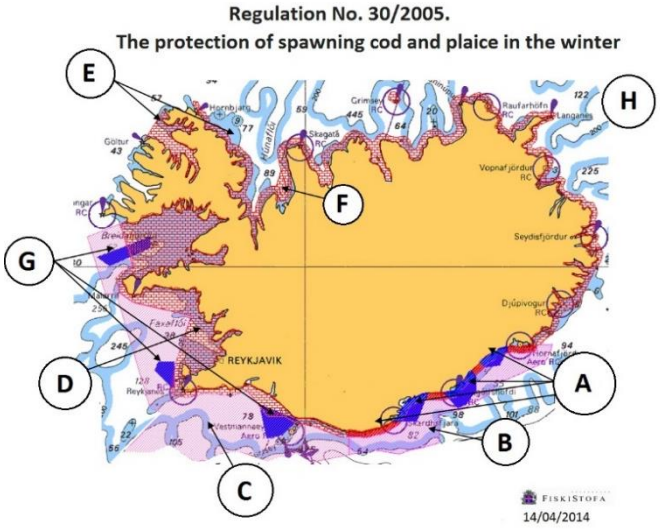
All fish in Iceland must be landed in authorized ports and weighed by authorized weighers [65] [66]. Special rules apply to caches that are processed on-board. The weighed catch is directly recorded on-line. The landings statistics are managed by the Directorate and are published on the Directorates web pages almost in real-time[67]. These landings are also used in the stock assessment.

**Area closures**

Area closures are widely used in Icelandic fisheries management. They can be permanent or temporary. Some closures are designed to avoid exploitation of cod at the spawning grounds in the spawning season. They are permanent according to regulations but apply only in the spawning season (Figure 17). These closures are primarily for cod and plaice but may offer some protection to other species as well. Other permanent closures are for certain gears, mostly all around the year (Figure 18).

In addition to closures that are permanent or regular, areas can be temporarily closed at short notice, in particular if concentrations of juveniles are detected[68]. These closures are triggered by finding too much juveniles in catches (for cod: more than 25% below 55 cm). They are managed by the MFRI, often at the advice from the Coast Guard or the fishing fleet, applied on few hours' notice and normally valid for 2 weeks. They are published in several channels, including on the web[69].

Fishing with trawls is prohibited in large areas near the coast which serve as spawning and nursery areas. Sorting grids in fishing gear are obligatory in certain fisheries to prevent catches of juvenile fish.




A. Regulation No. 30/2005. Eastern Region Article 1. 1 and 2. April 8th through April 16th

B. Regulation No. 30/2005. Eastern Region Article 1.3. Amended by Regulation No. 225/2007. April 17th to 10:00 April 28th

C. Regulation No. 30/2005. Western Article 2.4. Amended by Regulation No. 225/2007. April 12th to 10:00 April 21st

D. Regulation No. 30/2005. Western Article 2. Paragraphs 1, 2 and 3. April 1st through April 11th

E. Regulation No. 30/2005 Northern and Eastern Regions, Article 3. A, B and C amended by Regulation No. 380/2008 from April 15th to 10:00 April 30th (A, B and C).

F. Regulation No. 30/2005. Northern and Eastern Regions, Article 3. D amended by Rgl. 380/2008 from 15th April to time 10:00 April 30th (D).

G. Regulation No. 30/2005. Article 4 Plaice Area. Closures April 1st to April 30th

H. Regulation No. 30/2005. Article 5 exemptions. Article worded so that notwithstanding the provisions of Articles 1 to 4 fishing sea cucumbers, lumpfish, inshore shrimp, scallops, sea urchins, whelk, ocean quahog and rearing of cod is permitted provided requisite licenses for the relevant area are obtained. (Amended by Regulation No. 289/2010)

**Figure 17.** Permanent closures to protect spawning grounds for cod and plaice[70].

65 Law 57/1996: https://www.althingi.is/lagas/nuna/1996057.html
66 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/20213
67 http://www.fiskistofa.is/english/quotas-and-catches/
68 http://www.fiskistofa.is/fiskveidistjorn/veidibann has links to webpages for the various kinds of closures.
69 https://www.hafogvatn.is/is/skyndilokanir
70 http://www.fiskistofa.is/media/veidisvaedi/Hrygningarstopp_2.pdf

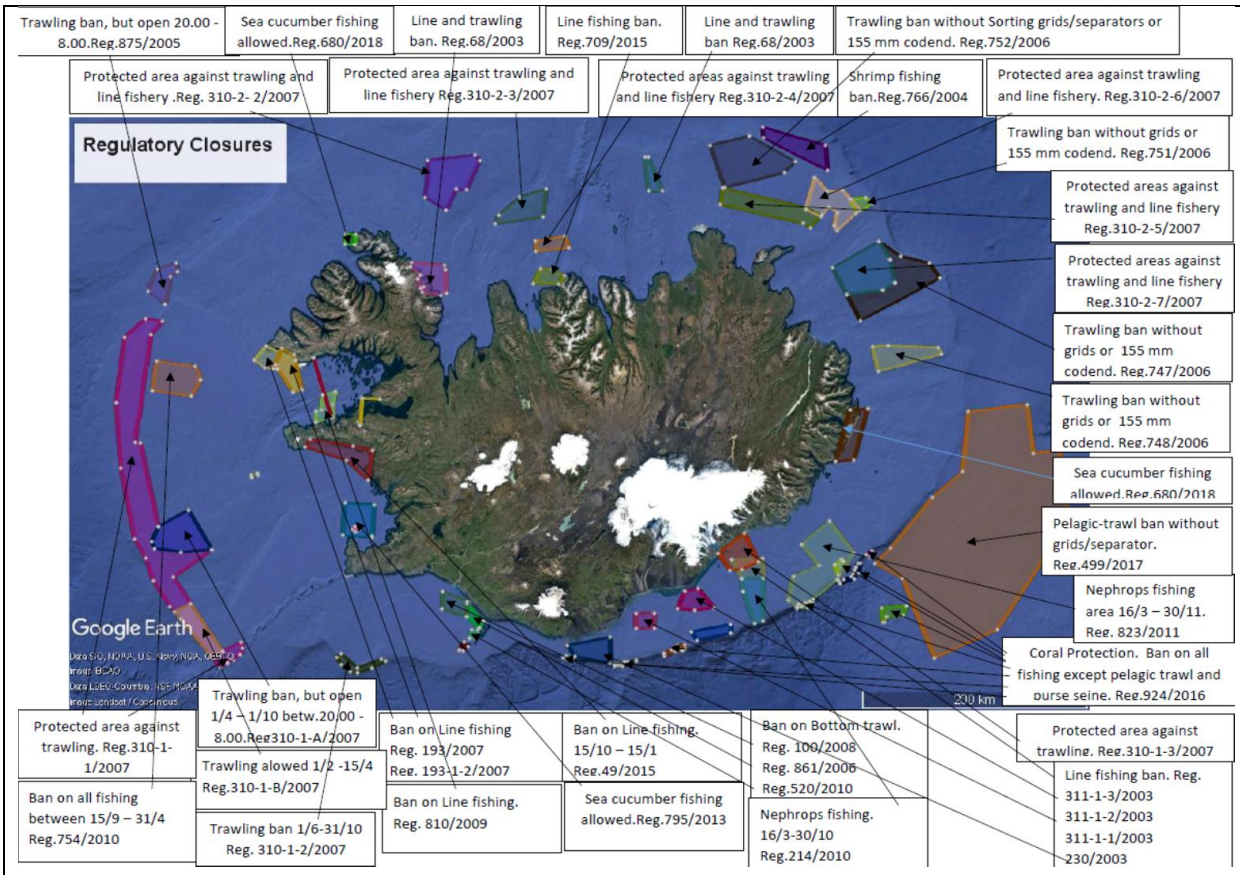



**Figure 18.** Regulatory Closures in Icelandic waters as of November 2018. Maps available from the Directorate's website.[71] Clicking on a marked field gives a listing of coordinates, legal basis and other issues of interest.

**Technical regulations:**

The general minimum mesh size in demersal trawls is 135 mm[72], with exceptions in for example shrimp fisheries. There are additional rules for the use of protecting mats and other technical details.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

71 http://www.fiskistofa.is/fiskveidistjorn/veidibann/reglugerdarlokanir/ This site has a link to maps in Google earth which provide very detailed information on locations of interest.

72 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/4032

### 10.1.1.4. Clause 1.1.4.

The Standard does not recognise fishing practices that are prohibited such as dynamiting, poisoning and other comparable destructive fishing practices.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Legal Instruments are in force which specify legal gears for each method of fishing. Legal gears do not include dynamiting, poisoning and other comparable destructive fishing practices.**

**Evidence:**
Only permitted gears (trawls, longlines, seine nets, gillnets, hook and line) can be used to target cod and other commercial species in Iceland. The use of dynamiting, poisoning and other comparable destructive fishing practices are prohibited under Icelandic law.

Legal Instruments are in force which specifies 'legal gears' for each method of fishing. Article 9 of Act No. 79/1997 states that the Minister shall take the necessary measures to prevent fishing practices which can be regarded as harmful to the efficient utilisation of the commercial stocks and preservation of sensitive ocean areas. The large majority of cod are captured using demersal trawl gear and long line, but other fishing gears which capture the species include gillnets, Danish seine, and automatic handlines/jiggers. These last 3 gear types have contributed to an average of 6-7% each of the overall cod catches in the past 3 years.

| | |
|---|---|
| **References:** | As referenced within text. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.1.5. Clause 1.1.5.

Transparency in the fisheries management and related decision-making process shall be ensured.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Digital tools for publication allow almost real-time publishing of results and decisions, including results of stock assessments, MFRI advice and catches and quota status even for individual vessels. Interested parties participate in decisions processes through regular meetings between industry and management authorities.**

**Evidence:**
Several mechanisms exist for ensuring transparency.

Digital tools for publication are used extensively, where results and decisions are published once they are ready. The assessment of cod is done by the ICES North-Western Working Group (NWWG)[73]. ICES provide advice based on the results from NWWG[74]. The advice and the NWWG report are publicly available at the ICES website. The final advice to Icelandic authorities is provided by MFRI. The MFRI advice tends to follow closely the advice for ICES. MFRI provides an overview of the state and the advice for each of all major Icelandic stocks on its website once the advice in June each year [75]. Likewise, the Directorate has a very transparent system for real time publication of catches and quota status even for individual vessels. Furthermore, the Directorate of Fisheries publishes the level and type and infringements recorded in the fisheries annually (see clause 2.1.1 for further details and infringements tables).

Interested parties participate in decisions processes through regular meetings between industry and management. A special consultation group of the MFRI meets every year and reviews different sources and information regarding the main demersal stocks and fisheries in the Icelandic EEZ. The consultation group consists of experts from the MFRI and fleet managers and skippers from many places around the country which conduct fisheries on small and large vessels with different gears. When the advice has been made available the Minister consults with representatives from the main stakeholders before decision is taken and regulation on commercial fisheries is issued. Environmental NGOs, the general public and other potentially interested parties have full access to information generated by management organisation and a number of opportunities to interface with them through existing meeting and arrangements.

One of the more important sources of information used by the MFRI in its research is logbooks from skippers which are sent to the MFRI. Account is taken of these sources and information in research, quantification and advice as appropriate.

73 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/NWWG/11%20NWWG%20Report%202018_Sec%2009_Icelandic%20cod%20in%205.a.pdf
74 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cod.27.5a.pdf
75 For Cod: https://www.hafogvatn.is/static/extras/images/%C3%9Eorskur_2018729230.pdf

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|---|---|
| Being a small nation, the Icelandic society is quite transparent. For example, several institutions often emphasize the value of direct communication and of knowing people. That transparency is facilitated by institutions like the Fisheries Directorate, having offices in all parts of the country. | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.1.6. Clause 1.1.6.

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

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The ITQ system gives fishermen the option and flexibility to target specific species and fishing grounds across the fishing year, minimising potential conflicts with other operators.** | | | | |
| **Evidence:**<br>The ITQ system gives fishermen the option and flexibility to target specific species and fishing grounds across the fishing year, minimising potential conflicts with other operators. Furthermore, the Ministry can and does close areas for certain gears, a map of these gear specific closures is available under clause 1.1.3. Quota allowances for Coastal fisheries (smallest fishing boats in Iceland) also serve to avoid the potential for conflicts.<br><br>The Coast Guard operates the Icelandic Maritime Traffic Service within its operations centre. This centre is a single point of contact for all maritime related notifications, involving, for example, the Maritime Rescue Co-ordination Centre, the Vessel Monitoring Centre and the Fisheries Monitoring Centre. This traffic centre has a key role in ensuring safety at sea, but can also take action if the behaviour of a fishing vessels is unusual. Conflicts between vessels and gears in Icelandic fishing grounds does not appear to be common. | | | | |
| **References:** | | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

## The Fisheries Management Plan

### 10.1.1.7. Clause 1.1.7.

Fishing for the "stock under consideration" shall be managed by the competent authorities in accordance with a documented and publicly available Fisheries Management Plan.[76]

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Icelandic cod is subject to a formal Fishery Management Plan and harvest control rule. In 2015, the FMP was extended until 2020.**

**Evidence:**

Icelandic cod is subject to a formal Fishery Management Plan[77] and harvest control rule [78] and managed under the overarching responsibility of the Ministry of Industries and Innovation. In 2015, the plan was extended until 2020. The plan, which aims at providing maximum sustainable yield, has been evaluated by ICES and is considered to be precautionary[79]. The management of cod is part of the general fisheries management in Iceland, and rules and regulations that apply in general apply to cod as well. These elements, as outlined in previous clauses (Clause 1.1.1 - 1.1.3) and in Clauses 1.1.8 - 1.1.10, include:

- A legal basis for relevant management measures
- Organized distribution of authority and responsibility between institutions.
- Support for regular stock assessments, including monitoring of catches, bottom trawl surveys, sampling of biological data and assessments in an international framework.
- Organized advice following assessments according to an agreed harvest rule.
- Quotas in an ITQ system
- Technical regulations of fishing gear, area and season
- Control and enforcement of regulations.

Some elements are specific to cod, for example the stock assessment and the harvest rule. These elements are in place, documented and publicly available. A revision of the FMP is planned for 2020 or 2021. So far, there are no indications that the plan will change.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

76 FAO Code of Conduct, art. 7 .3.3.
77 MII. 2015. Icelandic Ministry of Industries and Innovation's fisheries management plan for Icelandic cod.
78 https://www.government.is/news/article/2018/05/15/Haddock/
79 http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

### 10.1.1.8. Clause 1.1.8.

The Fisheries Management Plan developed and adopted by the competent authorities shall be formulated with due consideration to the following:

1.1.8.1 The management unit;

1.1.8.2 Specification of stock or component stocks of "stock under consideration";

1.1.8.3. Jurisdiction areas and the respective competent authorities for the entire range of component stock(s) of "stock under consideration";

1.1.8.4. The long-term harvesting policy, consistent with achieving optimum utilization, including the means for assurance of its consistency with the precautionary approach to fisheries management.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The unit managed by Icelandic authorities is cod in Icelandic waters. The relevant stock of cod is confined to Icelandic waters and managed by national authorities. The long-term harvesting policy is to set annual quotas in accordance with a harvest rule that has been demonstrated by simulations to imply low risk of exceeding limit reference points and to provide a yield close to the maximum sustainable yield.**

**Evidence:**

Icelandic cod is subject to a formal Fishery Management Plan[80] and harvest control rule [81]. The unit managed by Icelandic authorities is the Icelandic cod stock distributed all around Iceland, and in stock assessment and management cod within Icelandic EEZ waters is assumed to be a single homogeneous unit. The jurisdiction areas (Iceland ICES area 5a) and the respective competent authorities (MII, MFRI) for the entire range of the stock under consideration are specified in the cod FMP.

Some genetic studies have suggested possible genetic differences between cod in various regions. This might cause some concern if there were components that got unduly exploited, but with the low fishing mortality and the spread of the fishing effort all around Iceland, this is not regarded as a problem. Spawning takes place in late winter mainly off the southwest coast (Figure 19). The pelagic eggs and larvae from the main spawning grounds drift clockwise northwards and eastward along the island to the main nursery grounds off the north coast. The mature stock takes on feeding migration from the spawning grounds to feeding grounds both to deeper waters in the northwest and southeast or within the shallow water realm of the continental shelf proper. Smaller, variable regional spawning components have been observed all around Iceland.

[80] MII. 2015. Icelandic Ministry of Industries and Innovation's fisheries management plan for Icelandic cod.

[81] https://www.government.is/news/article/2018/05/15/Haddock/

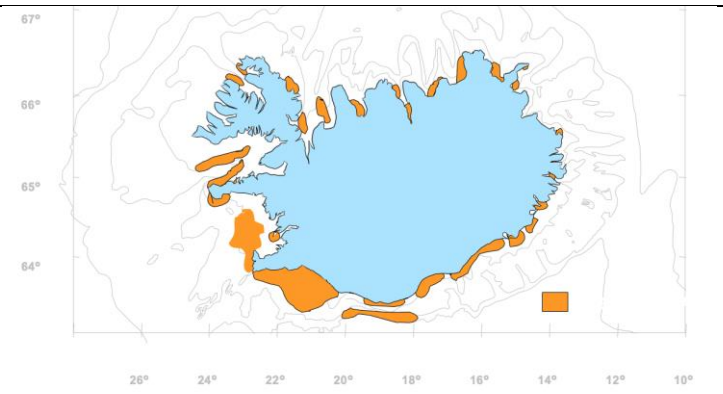



**Figure 19.** Spawning grounds for Icelandic cod. Figure provided by MFRI during Nov. 2018 site visit.

A larval drift to Greenland waters has been recorded in some years and substantial immigrations of mature cod from Greenland which are considered to be of Icelandic origin have been observed in some periods. This pattern was considered to be quite prevalent prior to 1970, when condition in Greenland waters were favourable for cod productivity. Immigrations have been estimated in the stock assessment from anomalies in the catch-at-age matrix with timing and age of such events being based on expert judgement using external information. The most recent of such migration was from the 1984-year class in 1990. Recent tagging experiments as well as abnormal decline in survey indices in West Greenland waters indicate that part of the 2003 and to some extent the 2002-year classes may also have migrated from Greenland to Icelandic waters. In the current assessment the immigration at age 6 in 2009 is estimated around 9.7 million (out of 64.1 million at age 6) corresponding to an additional biomass of around 31 kt in 2009. [82]

Such immigration episodes have not been assumed in the evaluation of the harvest rule for cod but are taken as a bonus when they occur.

The long-term harvesting policy is to set annual quotas in accordance with a harvest rule (see Clause 1.1.9 for details) that has been demonstrated by simulations to imply low risk of exceeding limit reference points and provide a yield close to the maximum sustainable yield.

| | |
|---|---|
| **References:** | As referenced in footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

82 Annex 6 in http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKICE%202015/wkice_2015_final.pdf

### 10.1.1.9. Clause 1.1.9.

The Fisheries Management Plan shall specify:

1.1.9.1. The long-term objective(s) of the fisheries management, including target(s) for stock biomass and target value(s) or range(s) for fishing mortality or its proxy;

1.1.9.2. Limits with respect to precautionary management, including the limit reference point for stock size or its proxy and the limit reference point for fishing mortality or its proxy (e.g. harvest as a proportion of stock size, etc.)[83], as well as remedial action to be taken if limits are approached or exceeded;

1.1.9.3. The applicable harvest control framework or harvest control rule, as appropriate.

1.1.9.4. The primary approach applied to managing the fisheries (e.g. input controls, output controls, etc.).

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The long-term objective in the Management plan is to maintain the exploitation rate at the rate which is consistent with the precautionary approach and that generates maximum sustainable yield (MSY) in the long term. This is achieved primarily by setting quotas according to a harvest rule. The rule states a fixed harvest rate as a proxy for a target fishing mortality which is reduced if SSB is below a trigger value. There are limit values for SSB and fishing mortality defined, and simulations have demonstrated a low risk to exceed the limits.**

**Evidence:**

**The long-term objective** is stated in the collection of management plans published by the Ministry. [84]

*The management strategy for Icelandic fish stocks in general, including cod, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term.*

The harvest rule in the management plan for cod is stated in the same document:

*The annual Total Allowable Catch (TAC) is set by a Harvest Control Rule (HCR). The rule is based on the mean of the TAC in the current year ($TAC_{y-1/y}$) and 20% ($HR_{MGT}$) of the biomass of 4 year and older cod ($B_{4+,y}$) in the assessment year (y). If the spawning stock biomass (SSB) falls below 220 000 tonnes (MGT $B_{trigger}$), the HCR dictates that harvest rate shall be reduced linearly to zero based on the ratio of the SSB estimated and MGT $B_{trigger}$.*

Some formulas that appear in official documents were found to have mistakes, but only for the case where SSB is below the trigger. Above Btrigger the HCR formula is TACy/y+1 = (0.20 ∗ B 4+,y + TAC y−1/y )/2.

*In accordance with the general aims of the management strategy for cod, the HCR was adopted by the Icelandic authorities in June 2009 for a period of 5 years (Letter from the Ministry of Fisheries and Agriculture*

83 $F_{lim}$ can be explicit, or implicit in cases where harvest rate is set annually to a precautionary $F_{lim}$ (or its proxy)]

84 https://www.government.is/news/article/?newsid=cf30e5ad-584f-11e8-9429-005056bc4d74

| | |
|---|---|
| *to ICES dated May 23rd, 2009). In 2015 the plan was extended until 2020 (Letter from the Ministry of Industry and Innovation to ICES dated June 2nd, 2016).*<br><br>The HCR without reduction in harvest rate at low biomass was evaluated by ICES and found to be consistent with the Precautionary Approach[85]. Hence, any rule to reduce the exploitation at low SSB would make the rule more robust and facilitate rebuilding should the SSB drop below the trigger.<br><br>Reference points, including precautionary limits, have been defined. They are described in Clause 1.3.1.4. Remedial action to be taken if the limit reference point are approached are defined as follows: *the harvest rate shall be reduced linearly to zero based on the ratio of the SSB estimated and MGT* $B_{trigger}$.<br>**The primary approach to managing** the fishery is output control in terms of quotas that are distributed on individual vessels in an ITQ system, as described in Clause 1.1.3. | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

85 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2010/Special%20Requests/Icelandic%20cod%20management%20plan.pdf

### 10.1.1.10. Clause 1.1.10.

The Fisheries Management Plan shall also consider the following:

1.1.10.1. The specific management method/approach or measures, according to fleet or jurisdiction or other relevant variables as appropriate;
1.1.10.2. Any further measures which support meeting the management objectives;
1.1.10.3. The institution(s) or arrangement(s) responsible for providing stock assessment and advice;
1.1.10.4. A description of the process for making decisions on Total Allowable Catch (TAC) - how and on what basis management decisions are made;
1.1.10.5. Provisions for considerations and consultation with the fishing industry and relevant authorities.
1.1.10.6. The means of implementing the management approach, including main provisions for monitoring, control, surveillance and enforcement
1.1.10.7. The objectives and management measures relevant to ecosystem effects of the fishery.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**The primary management method is quotas set according to a harvest rule that has been shown to be in accordance with the precautionary approach and lead to near maximum long term yield. The quota regulations are supplemented by area closures, mesh size regulations, sorting grids in selected fisheries, discard ban and surveillance at sea and at landing sites. The quotas are derived from an assessment, performed with approved methodology by the ICES NWWG, and finally decided by the Ministry taking advice from MFRI and the industry.**

**Evidence:**
The primary management method is quotas set according to harvest control rule[86] that has been shown to be in accordance with the precautionary approach and lead to near maximum long term yield. This is specified in the cod FMP.

Furthermore, the FMP details that core ITQ regulations are supplemented by area closures, mesh size regulations, sorting grids in selected fisheries, discard ban and related flexibility measures and surveillance at sea and at landing sites (Clause 1.1.3).

The FMP also explains that quotas are derived by applying the harvest rule to the outcome of the yearly stock assessment, performed with approved methodology by the ICES NWWG (Clause 1.2.1), and finally decided by the Ministry taking advice from MFRI and industry stakeholders (see Clause 1.1.5 for further details).

The FMP describes the management measures and objectives relevant to ecosystem effects of the fishery as follows.

Large areas within the Icelandic EEZ are closed for fishing, either temporarily or permanently. These closures are aimed at protecting juveniles and spawning fish and protecting vulnerable marine ecosystems.

[86] https://www.government.is/news/article/2018/05/15/Haddock/

| | |
|---|---|
| Restrictions on the use of gear are also in effect. Thus, the use of bottom trawl and pelagic trawl is not permitted inside a 12-mile limit. Similar restrictions are implemented elsewhere based on engine size and size of vessels and large bottom trawlers are not permitted to fish closer than 12 nautical miles to the shore.<br><br>In many areas special rules regarding fishing gear apply, e.g. a requirement of using a sorting grid when fishing for shrimp to avoid juveniles and small fish and an obligation to use bycatch- or juvenile grid when fishing for pelagic species in certain areas to protect other species and juveniles.<br><br>It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; cold-water corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Known cold-water coral reefs and hydrothermal vents are protected through permanent closures. The MFRI provides advice on closures to protect VMEs which are promptly processed within the Ministry Industries and Innovation. | |
| **References:** | See footnotes and other references. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.2. Clause 1.2. Research and Assessment

#### 10.1.2.1. Clause 1.2.1.

A competent research institute or arrangement shall collect and/or compile the necessary data and carry out scientific research and assessment of the state of fish stocks and the condition of the ecosystem. Research results shall be made public in a timely and readily understood fashion.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The Marine and Freshwater Research Institute (MFRI) which is the main research institute in marine science in Iceland, is regarded as the competent research institute. Data collection for assessment purposes, both from the fishery and surveys, is performed by the MFRI in cooperation with the Fisheries directorate. MFRI issues advice on individual stocks on the web once it is ready. The report from the underlying stock assessment and the ICES advice are readily accessible on the ICES website.**

**Evidence:**

The Marine and Freshwater Research Institute (MFRI)[87] is the main research institute in marine science in Iceland. The MFRI is owned by the Ministry of Industry and Innovation to which it is responsible for the provision of scientific advice. The MFRI covers all major fields in marine science and its remit was recently extended to include inland waters.[88] The MFRI has a staff of about 190 with sections for demersal resources, pelagic resources, aquaculture, freshwater resources and the marine environment, as well as supporting sections, including sampling and computing.

The MFRI has two research vessels Árni Friðriksson (LOA 69.9 m) and Bjarni Sæmundsson (LOA 56 m). The former, delivered in 2000, is a modern multi-purpose research vessel designed for fisheries and oceanographic research, principally in the North Atlantic Ocean, temperate and arctic water, and equipped to modern standards for a marine research vessel. Data collection for assessment purposes, both from the fishery and surveys, is performed by the MFRI, in cooperation with the Fisheries Directorate. This is described in detail in the Clause 1.2.2 (main stock assessment clause). MFRI has wide international cooperation in all major fields of marine science, as indicated by its publication record[89]. MFRI participates in providing annual stock assessment and international advice by ICES, which for the cod is done by the ICES North Western Working Group (NWWG). MFRI issues advice on individual stocks in June each year[90]. On its website, there is also links to publication records and to news form the institute. The report from the underlying stock assessment and the ICES advice are readily accessible on the ICES website[91].

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

87 www.hafro.is, www.hafogvatn.is/en
88 http://www.althingi.is/lagas/148a/2015112.html
89 https://www.hafogvatn.is/is/midlun/utgafa/ritaskra
90 https://www.hafogvatn.is/en/harvesting-advice
91 http://www.ices.dk/publications/library/Pages/default.aspx

### 10.1.2.2. Clause 1.2.2.

The relevant data collected/compiled shall be appropriate to the chosen method of stock assessment for stock under consideration and sufficient for its execution.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The cod stock is assessed using a forward running statistical catch-at-age model (ADCAM) fitted to catch numbers at age and indices at age from bottom trawl surveys in the spring and in the autumn. Landings data are provided by the Fisheries Directorate. Age distributions and weights and maturities at age are obtained from samples taken by MFRI from catches and in surveys. The surveys are extensive and cover the whole Icelandic shelf. The data are considered adequate for the assessment method. The assessment method has developed since 2002 and was last reviewed and endorsed by ICES in 2015. A revision is planned in 2021.**

**Evidence:**

The method for assessing the abundance and exploitation of the cod in Iceland has evolved since 2002. It is a forward running statistical catch-at-age model (ADCAM) where fishing mortality-at-age is allowed to change gradually in time as a random walk process. The model is fitted to catch numbers at age and to indices at age from two bottom trawl surveys. The survey residuals are modelled as multivariate normal distribution to account for potential survey "year effects".

ICES revisited the method in a benchmark process in 2015. It noted points that might be considered further, in particular a discrepancy between the two surveys, but did not recommend changes[92].

A full re-evaluation of the assessment method and procedures is scheduled for 2021.

The method and the handling of the input data has not undergone substantial changes in recent years. The data that are input to the current assessment are:

- Catch-at-age from 1955 onwards, age 3–14;
- Catch weight-at-age over the same period;
- Spring survey indices from 1985 onwards, age 1–10 (approximately 550 stations);
- Fall survey indices from 1996 onwards, age 1–10 (approximately 320 stations);
- Weight-at-age and maturity-at-age in the spawning stock (derived from the spring survey estimates except in ten years and older, where catch weights are used).
- Natural mortality is set to 0.2 for all groups.

These data are discussed in detail in the following. The data that go into the assessment for cod are regarded as high quality and are sufficient for the method.

92 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKICE%202015/wkice_2015_final.pdf

**Catch data**

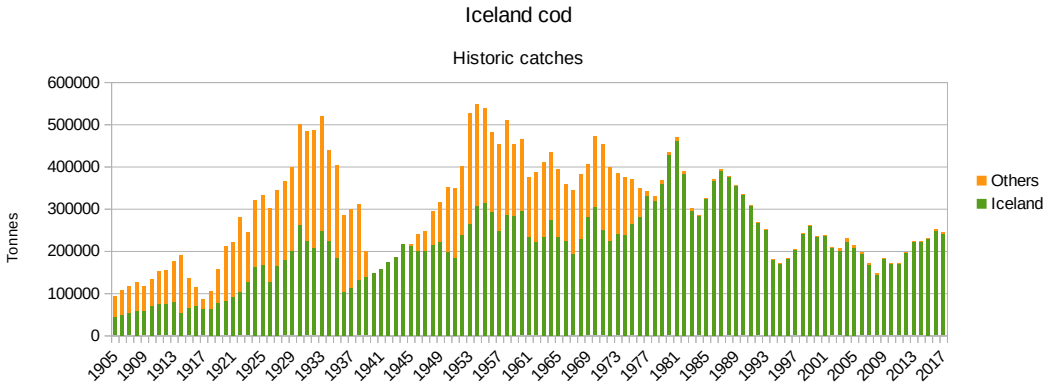



**Figure 20**. Historic catches of Icelandic cod by Iceland and foreign fleets.

Landings data[93] have been recorded back to 1905 (figure 21). There were peaks before and after WW2, with a large contribution of foreign catches. When the Icelandic zone was closed to foreign vessels, the Iceland fleet took over. However, the catches declined gradually until the mid-1990s. Since then they have fluctuated between approximately 150 000 tonnes and 250 000 tonnes.

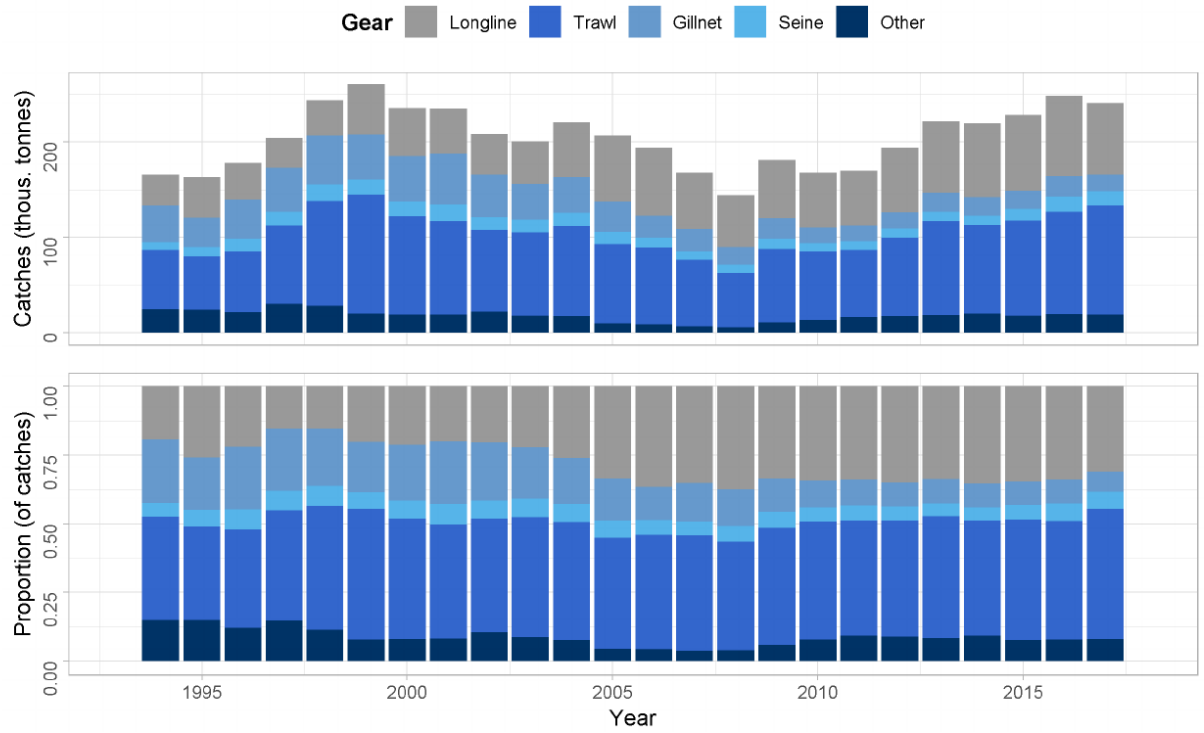



**Figure 21.** Catches of cod (landings) by gear since 2014.

93 https://dt.hafogvatn.is/astand/2018/01_thorskur.html

The dominating gears are bottom trawl and long line. The fraction taken with gillnets went down and the fraction with long-line went up until about 2010; since then the ratio has been relatively stable at about 7% of total catches in the past 3 years.

Cod is caught all around Iceland. Trawl catches are taken on the shelf, as trawl is generally not permitted in coastal waters. Demersal (Danish) seine and gillnet is mostly used in coastal areas. Long line catches are more wide-spread. Figure 22 gives and overview over the recent distribution, Figures 23 and 24 provide more detail and a longer time perspective.

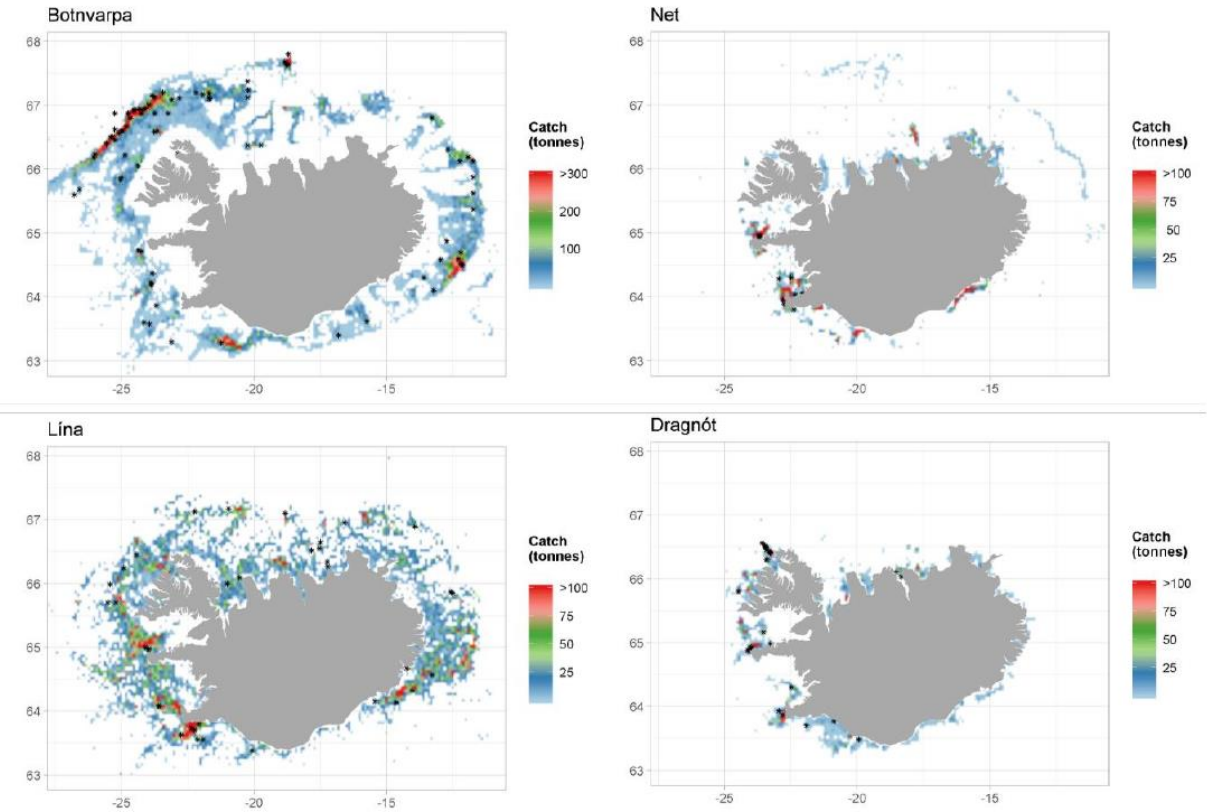



**Figure 22.** Geographical distribution of catches of cod by gear in 2018, and position of sampled catches: Upper left: Bottom trawl. Lower left: Longline. Upper right: Demersal seine. Lower right: Gillnet.

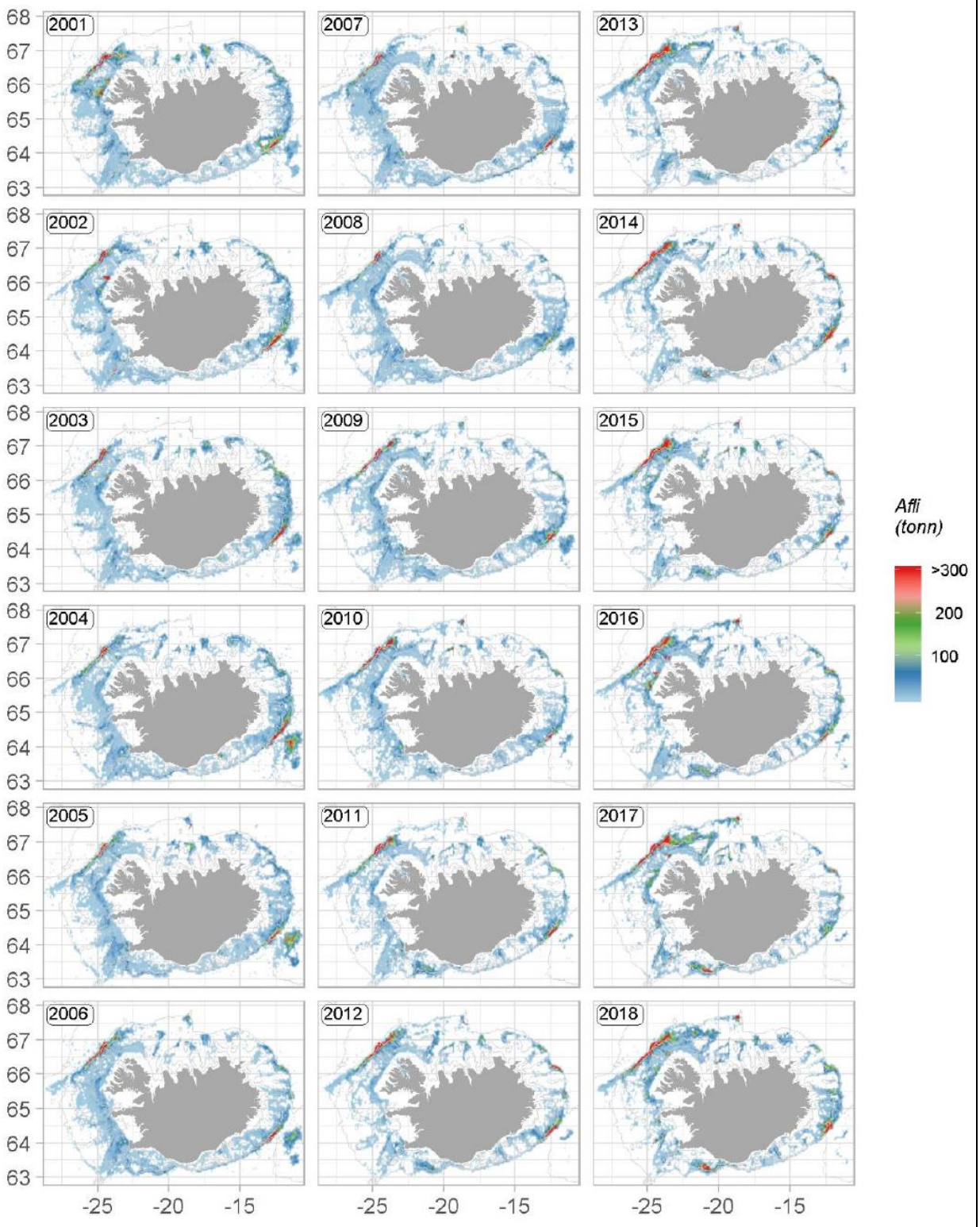



**Figure 23.** Distribution of trawl catches of cod. Reported catch from log-books. 100, 200 and 500 isobaths are shown.

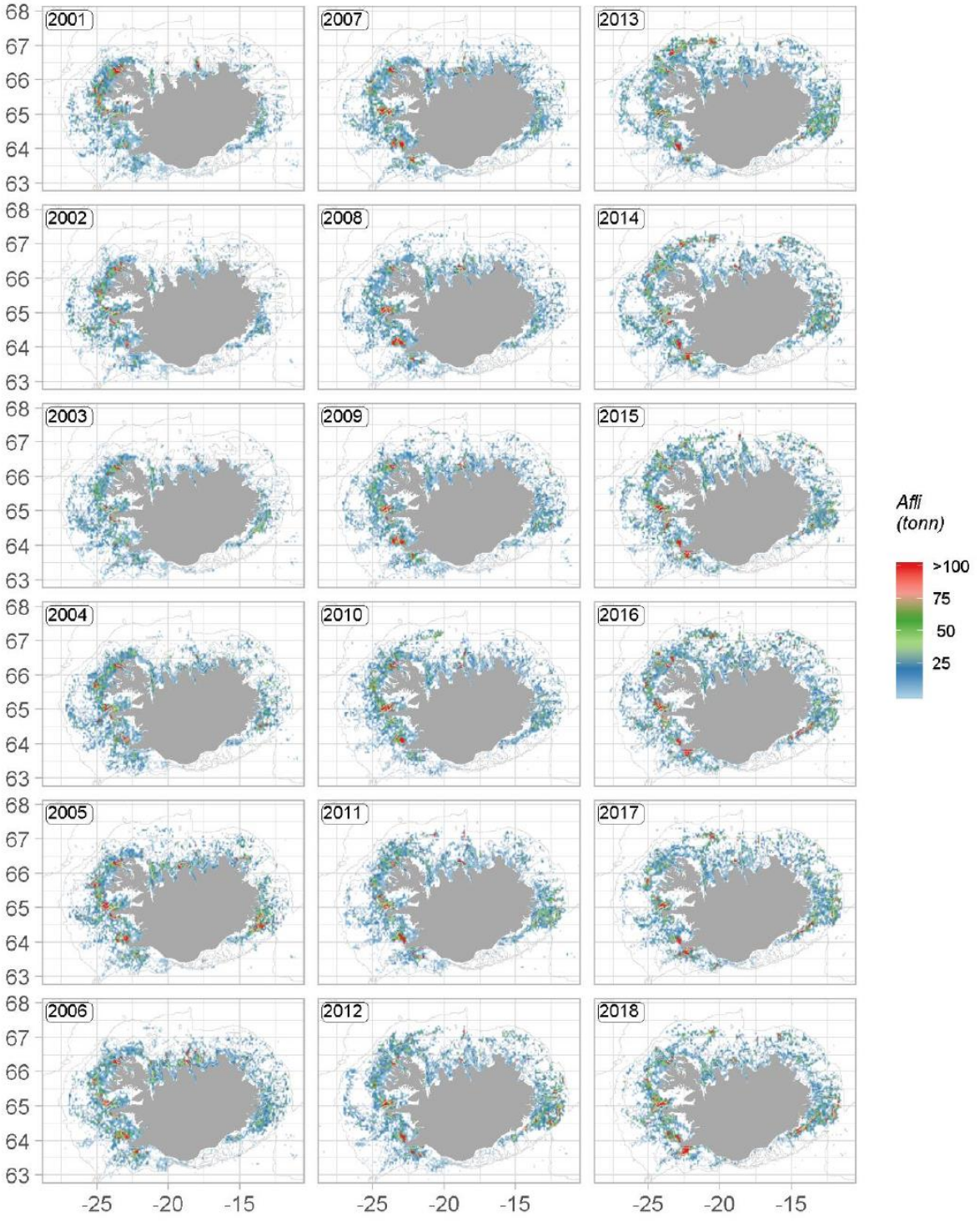



**Figure 24.** Distribution of long line catches. Reported catch from log-books. 100, 200 and 500 isobaths are shown.

According to law, all catches have to be landed in authorized ports and weighed by authorized weighers. The landings are recorded directly in a data-base held by the Directorate and used to monitor the quota status and to provide landings data for the assessment.

**Discards**

Discards is prohibited in Iceland and are generally assumed to be minor. MFRI does systematic comparisons of length distributions in catches of cod and haddock with and without inspectors on board[94]. These studies indicate discard rates of a few percent, but only covers discards of smaller fish through high-grading. It is not clear what caused the increase in 2015. In the past, discards may have been higher. Anecdotal information indicates that it may have been substantial even prior to the 1990s. Discards are not included in the stock assessment.

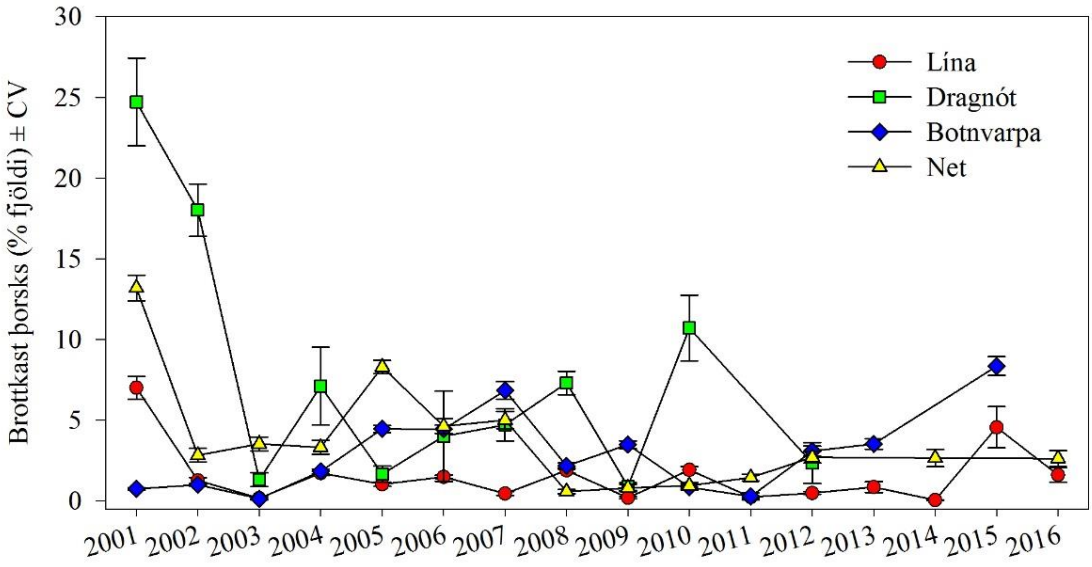



**Figure 25.** Estimated discards in percentage of numbers of cod by gear type. Red: Longline, Green: D. seine, Blue: Demersal trawl, Yellow: Gillnets.

**Sampling of catches**

The landings are converted to catch numbers at age by applying age distributions and individual weights from samples. These samples are mostly taken by MFRI staff, but some by staff from the directorate (mostly length samples).

The sampling by the staff of the Marine Research Institute is directly linked to the daily landings statistics available from the Directorate of Fisheries. For each species, each fleet/gear and each landing strata a certain target of landings value behind each sample is pre-specified. Once the cumulative daily landings value pass the target value an automatic request is made to the sampling team for a specific sample to be taken. The number of samples and the number of otoliths read is shown in Table 6. The numbers are

94 https://www.hafogvatn.is/is/midlun/utgafa/haf-og-vatnarannsoknir/maelingar-a-brottkasti-thorsks-og-ysu-2014-2015. The figure was updated by MFRI after publishing.

regarded as sufficient to obtain high quality input data to the assessment. The system for requesting samples should implicitly take into account seasonal variability of the landings of any species and the geographical distribution of the fisheries. The fishing location of the fish measured at harbour is known with reasonably accuracy, because fishing date is registered for each fish box and can hence be linked to geographic location of the fishing at that date, based on the captain's logbook record.

**Table 6.** Yearly number of samples and number of otoliths by gear.

| | BOTNVARPA | | LÍNA | | NET | | DRAGNÓT | |
|---|---|---|---|---|---|---|---|---|
| ÁR | *Sýni* | *Kvarnir* | *Sýni* | *Kvarnir* | *Sýni* | *Kvarnir* | *Sýni* | *Kvarnir* |
| *2010* | 89 | 4395 | 58 | 2881 | 16 | 799 | 7 | 350 |
| *2011* | 84 | 4200 | 46 | 2294 | 14 | 700 | 10 | 500 |
| *2012* | 88 | 4400 | 56 | 2800 | 21 | 1031 | 10 | 582 |
| *2013* | 71 | 3550 | 59 | 2947 | 21 | 1050 | 7 | 329 |
| *2014* | 87 | 2667 | 58 | 1725 | 29 | 850 | 20 | 525 |
| *2015* | 112 | 3192 | 52 | 1453 | 35 | 875 | 28 | 700 |
| *2016* | 110 | 2915 | 60 | 1544 | 40 | 1000 | 41 | 1025 |
| *2017* | 84 | 2106 | 46 | 1119 | 26 | 644 | 39 | 975 |
| *2018* | 92 | 2369 | 39 | 945 | 16 | 400 | 30 | 750 |

Catch in numbers are calculated by combining length distributions and age-length keys. This is done disaggregated on two areas (northeast and southwest), four gears (trawl, longlines, Danish seine and gillnets) and two seasons (January–May, June–December). The catch in numbers are calculated for each metier and then combined to total catches in numbers.

**Weight at age in the catch and maturity at age**

Mean weight-at-age in the landings is available back to 1955. Prior to 1993 mean weight-at-age was compiled using fixed length–weight relationship as weighing of fish was relatively uncommon in that period. Since 1993 weighting of fish has been extensive with large proportion of cod sampled for otoliths weighted gutted and part of it ungutted. The weighting programme has shown that the error in assuming fixed length–weight relationship is relatively small (<3%) and that most of observed changes in mean weight-at-age are really changes in mean length-at-age.

Maturity-at-age is based on inspection of gonads in samples obtained from spring survey. The survey time is close to the spawning time making visual detection of maturity stages optimal.

Most cod is landed gutted. Fishing vessels typically land gutted fish, but the quota allotted to the vessels is terms of ungutted weight, as is the assessed biomass. A fixed factor (0.84 for cod) is used to convert ungutted to gutted[95]. Although the actual ratio may be somewhat different, this factor just acts as a scaling factor, and has no other impact on the assessment.

95 http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/slaegingarstudlar/

**Surveys**

Two bottom trawl surveys are conducted in Icelandic waters: the Spring Survey in March (1985–2019) and the Autumn Survey in October (1996–2018) (except in 2011).

The spring survey is primarily conducted with rented commercial trawlers, of a type built in 1972-73, all almost identical. Each year, up to five trawlers have participated in the survey, each in a different area (NW, N, E, S, SW). The trawlers are now considered old and it is likely that they will be decommissioned soon, so the search for replacements has started. The survey gear is based on the trawl that was the most commonly used by the commercial trawling fleet when the survey started in 1984–1985. It has a relatively small vertical opening of 2–3 m. The headline is 105 feet, fishing line is 63 feet, footrope 180 feet and the trawl weight 4200 kg (1900 kg submerged). Length of each tow was set at 4 nautical miles and towing speed at approximately 3.8 nautical miles per hour. The minimum towing distance for the tow to be considered valid for index calculation is 2 nautical miles. Towing is stopped if wind is more than Beaufort force 8 (17–21 m/s.)

The autumn survey has been conducted since 1996. It has fewer (about 200) spread stations and that include deeper waters, to cover Greenland halibut and beaked redfish. It is performed with MFRI research vessels, (RV Bjarni Sæmundsson in shallow water, RV Árni Friðriksson in deeper water). The gear and tow specifications are as for the spring survey. The stations in both surveys are shown in Figure 26.

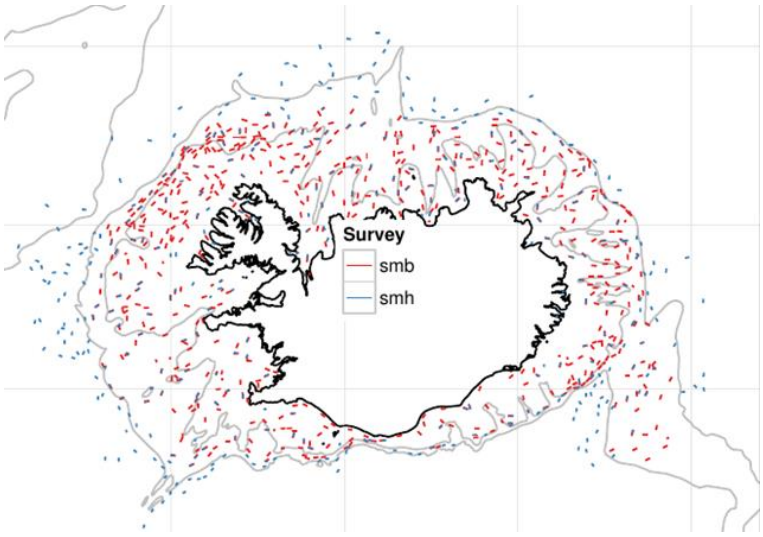



**Figure 26**. Bottom trawl surveys in Iceland. Red is spring survey, blue is autumn survey. These are the stations in 2013, but they vary very little from year to year.

An extensive survey protocol exists for these surveys.[96] This is an English translation of the manual from 2009, but there are at most minor changes from year to year. The figures 27 below show the catches of cod in the most recent surveys.

96 http://www.hafro.is/Bokasafn/Timarit/fjolrit-156.pdf

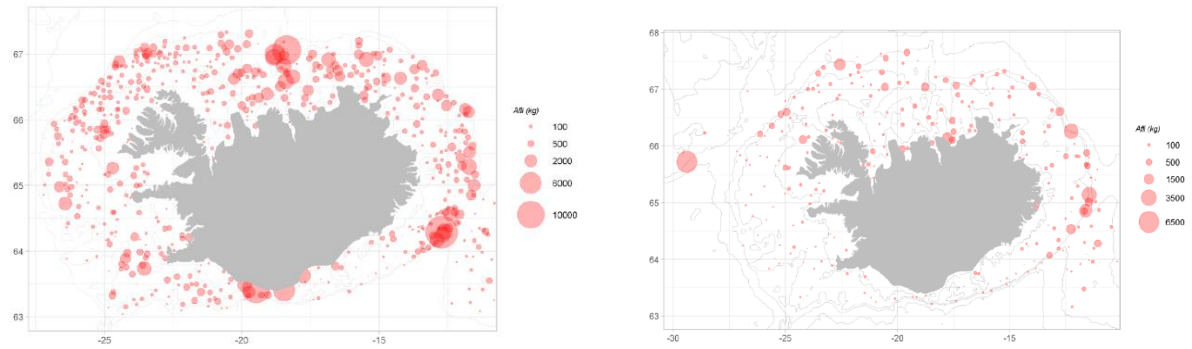



**Figure 27.** Survey catches of cod. Left: Spring 2019. Right. Autumn 2018.

In the surveys, fish of all species is length measured, in randomly collected samples. For the more important species, including cod, random samples are taken for otolith reading, as well as length, weight (gutted and ungutted), sex and maturity. The number taken for otolith reading varies with the amount, for cod it will be 25-50. The selection of fish to be sampled for age is linked to the length measurement - the computer is programmed to send a sound signal for every n length measured fish, where n depends on the otolith sampling ratio for the species.

| **References:** | See footnotes. |
|---|---|
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.2.3. Clause 1.2.3.

Stock assessments shall be based on systematic research of the size and/or productivity of the fish stock(s).

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The state of the stock and its tolerance to exploitation is assessed using the assessment tool 'ADCAM' Data on individual growth and maturity is obtained from samples of the commercial and survey catches. Each annual recruitment is estimated as a separate parameter, there is no stock recruitment relation assumed. The recruitment has largely been independent of the SSB, but there was a reduction in recruitment in the mid-1990s independent of SSB. Natural mortality has assumed values.** | | | | |
| **Evidence:**<br>The stock assessment is a synthesis of the information in the catch numbers at age data and the survey indices at age. ADCAM which has been used for assessing Icelandic cod since 2002, is a forward running statistical catch-at-age model which is fitted to catch and survey data at age. The fishing mortality-at-age is allowed to change gradually in time by using a random walk penalty on deviation from the separable hypothesis in the objective function. The method can be referred to as Error in Variables approach, rather than a full state-space model[97]. Retrospective analysis indicates that the assessment is very consistent from year to year. | | | | |

97 Annex 6 in http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKICE%202015/wkice_2015_final.pdf

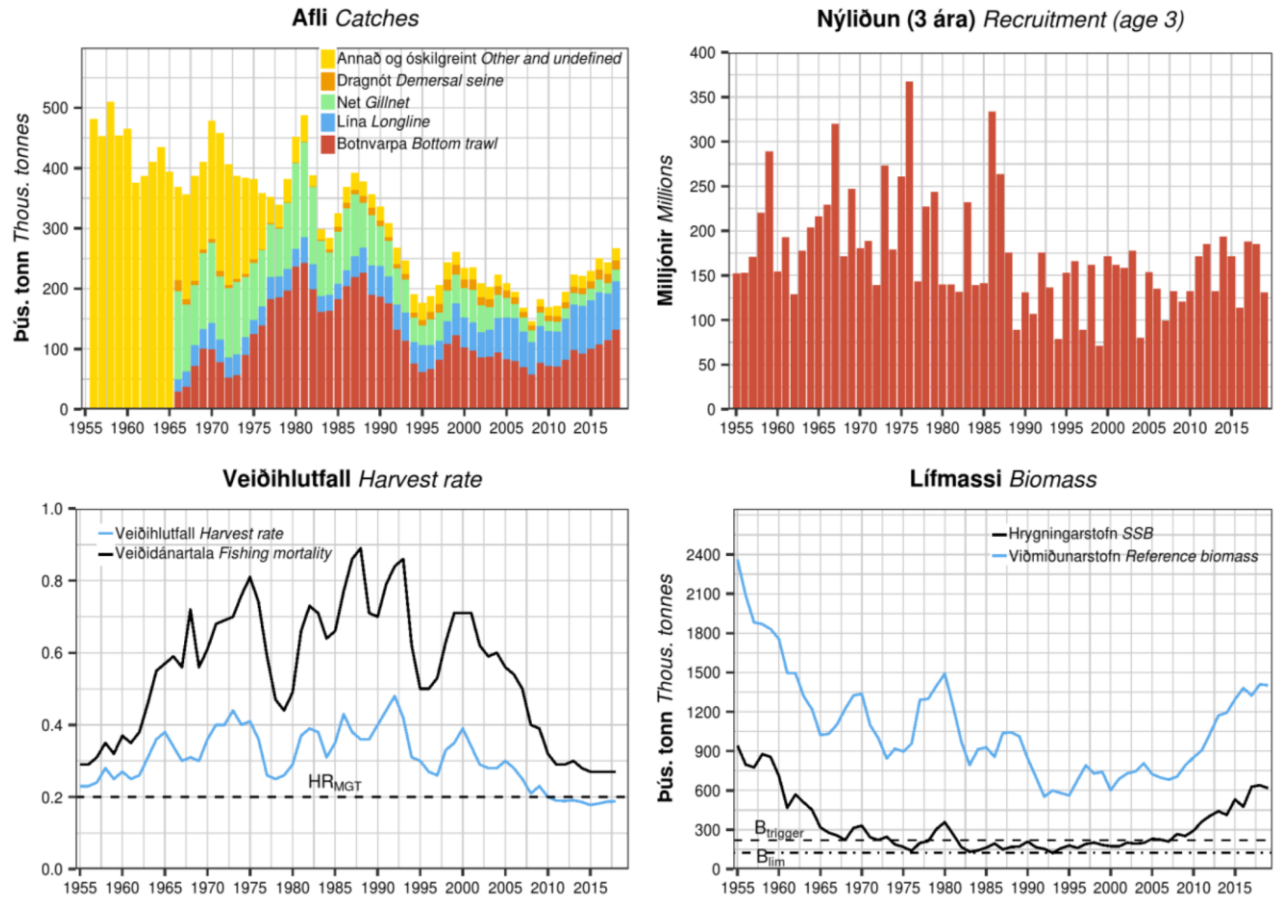



**Figure 28.** Catch by gear type, recruitment, fishing mortality and harvest rate, reference stock biomass (B4+) and spawning stock biomass (SSB)[98].

However, a more detailed analysis indicates that the various data sources have different impact on the stock estimates. For example, assessment based on tuning with the spring and the fall survey separately have in recent years shown that the fall survey gives a higher estimate than the spring survey (Figure 29). Tuning to both surveys can be regarded as a compromise, but the reason for the discrepancy is not clear. This problem is not specific for cod, and practice with regard to which survey to use varies between species. A benchmark assessment is planned for cod in 2021, where this issue will be considered.

[98] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

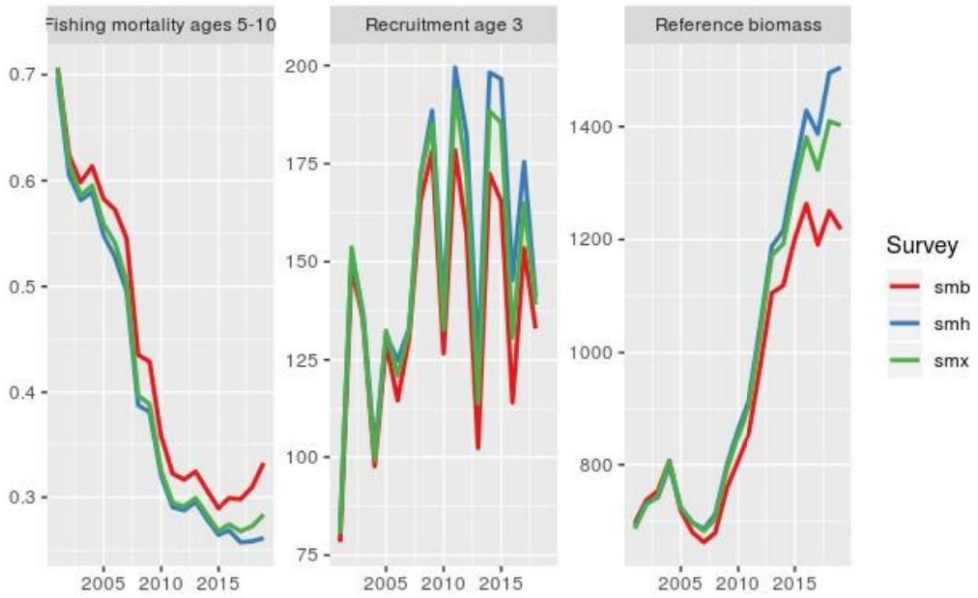



**Figure 29.** *Main results when fitting ADCAM to one or both surveys.*

***Weight at age*** in the assessment is not modelled but based on observations. Weight at age in the catch is obtained from samples of the catches. Weight at age in the stock (figure 30) is obtained from weight measurements in the spring survey, except for ages 10-14, where catch weights are used. This survey is close to the spawning season, and the weights in the stock are used to calculate spawning stock biomass.

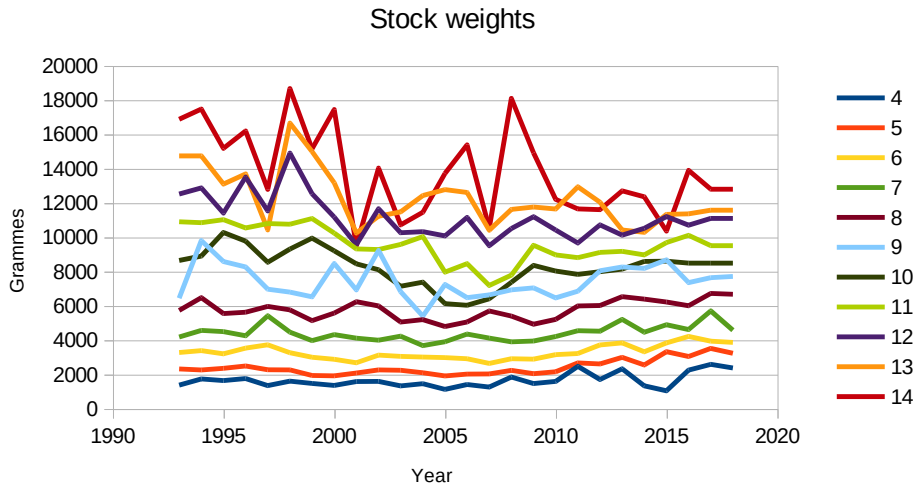



**Figure 30.** Stock weights at age.

For management purposes, the convention is to calculate the TAC as a fraction of the biomass of age 4 and older at the start of the year based on the catch weights. These weights are not known in time. For ages 4-9 they are calculated based on the survey weights from the spring survey and the relation between catch weights and spring survey weights in the year before. For older fish, just the previous survey weights are used.

Maturity at age is obtained from samples in the spring survey, where ungutted fish is examined and the timing is close to spawning time.

***The productivity*** of the stock is derived from recruitment estimates and yield per recruit, which are results from the assessment rather than input to the assessment.

Figure 31 shows the equilibrium yield and biomass as function of the harvest rate. This is the combination of yield per recruit and recruitment as function of SSB. As there is no clear stock-recruit relation, this indicates that the maximum yield is obtained at harvest rates at 0.20 or slightly above, and that the harvest rate of 0.2 is associated with a probability of bringing SSB below 220000 tonnes slightly below 5%. The steepness of the SSB curve indicates that the SSB is quite sensitive to even small changes in the harvest rate. The harvest rate in the management plan (0.20) is relatively conservative, providing a near maximum yield with a high mean SSB. This is further illustrated by the increased fraction of large fish in the catches. Over time, the harvest rate (and fishing mortality) have decreased, in particular after the introduction of the present harvest rule in 2009. Since 2010, when the present harvest rule was introduced, the estimated harvest rate has been at or below 0.22, and since 2014, it has been at or below the target value of 0.20.

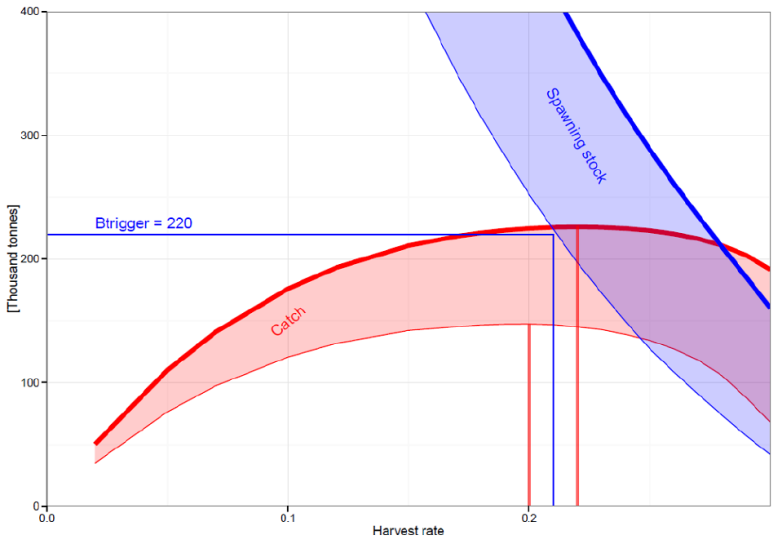



**Figure 31.** Equilibrium results from the harvest control rule evaluation conducted in 2015. Catch (red colours) and spawning stock biomass (blue colours) at equilibrium as a function of harvest rate. The tick lines refer to the mean and the thin lines to the lower 5$^{th}$ quantile.

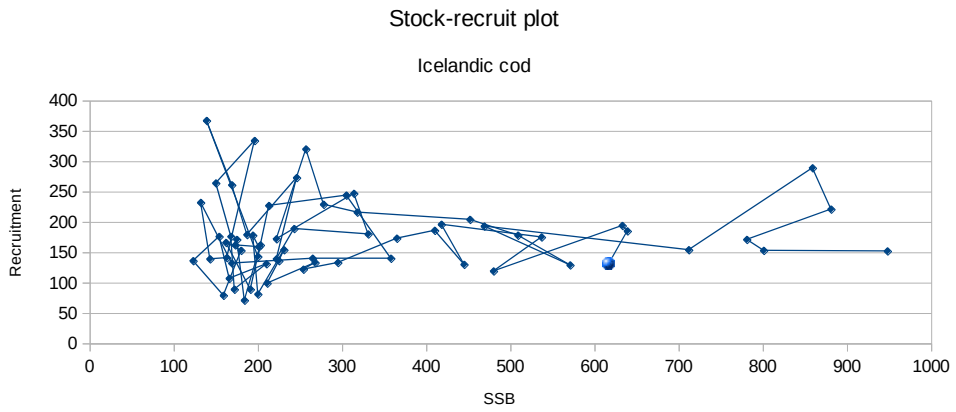



**Figure 32.** Historic SSB and recruitment. The big symbol is the most recent pair.

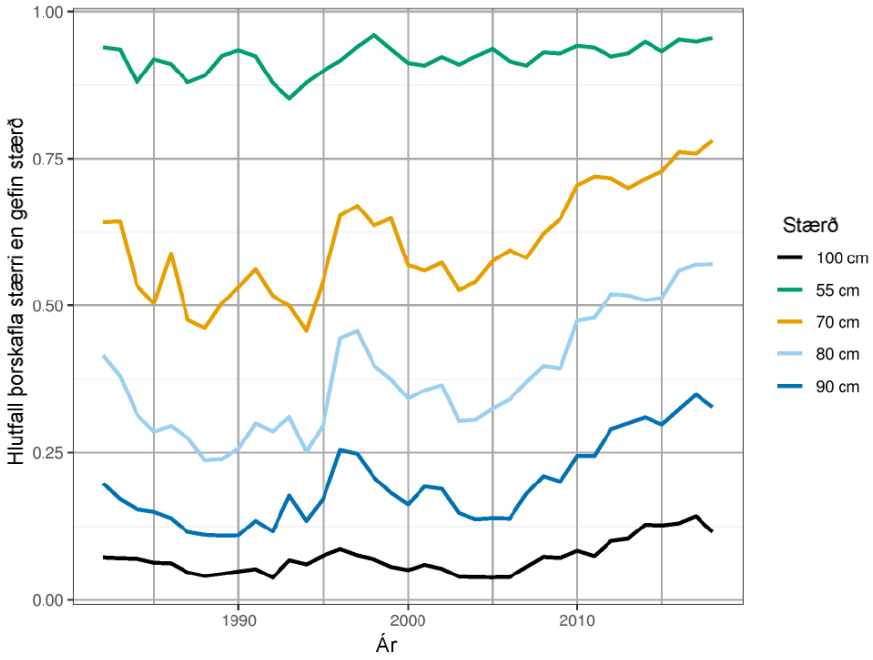



**Figure 33.** Proportion by weight of fish larger than the indicated length in commercial catches, by year.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.2.4. Clause 1.2.4.

For the stock under consideration, the determination of suitable conservation and management measures shall include or take account of total fishing mortality from all sources in assessing the state of the stock under consideration, including:

1.2.4.1. Estimates of discards;

1.2.4.2. Unobserved and incidental mortality,

1.2.4.3. Unreported catches and catches in other fisheries.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Discards are prohibited. Discards for cod are to some extent estimated and are small. Unobserved and incidental mortality is covered by the assumed natural mortality. The value for that is just assumed at a level that is regarded as sensible for most gadoids, including cod. The strict control with landings by the Directorate and detailed monitoring of fishing operations by the Coast Guard should make black landings very unlikely.**

**Evidence:**

***Discards***

Discards are prohibited in Iceland and are generally assumed to be minor, although direct measurements of discards are problematic and incomplete. MFRI does systematic comparisons of length distributions in catches of cod and haddock with and without inspectors from the Directorate on board[99] of fishing vessels. These studies indicate discard rates of a few percent and covers discards of smaller fish through high-grading. It is not clear what caused the increase in 2015. In the past, discards may have been higher. Anecdotal information indicates that it may have been substantial even prior to the 1990s. Discards are not included in the stock assessment.

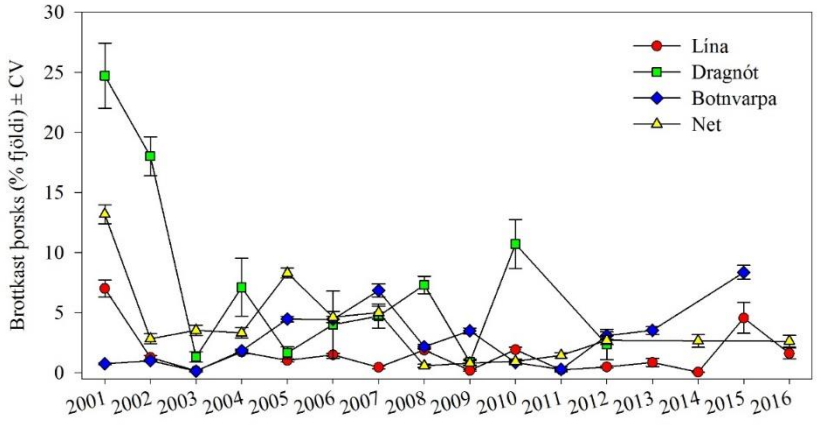



**Figure 34.** Estimated discards in percentage of numbers of cod by gear type. Red: Longline, Green: D. seine, Blue: Demersal trawl, Yellow: Gillnets.

99 https://www.hafogvatn.is/is/midlun/utgafa/haf-og-vatnarannsoknir/maelingar-a-brottkasti-thorsks-og-ysu-2014-2015. The figure was updated by MFRI after publishing.

| | |
|---|---|
| ***Unobserved and incidental mortality*** is covered by the assumed natural mortality. The value for that is just assumed at a level that is regarded as sensible for species like cod. No specific causes of natural mortality have been observed, in particular, predation mortality should not be a major cause of death. A recent study shows that cannibalism is limited to the largest cod (Hedeholm et al., 2016).[100]<br><br>***Unreported catches and catches in other fisheries.*** The strict control with landings by the Directorate and detailed monitoring of fishing operations by the Coast Guard should make black landings very unlikely.<br><br>The Faroes and Norway have some fishing permits in Icelandic waters, subject to the rules and regulation that apply to the Icelandic fleet. Foreign vessels must also notify the Icelandic Coast Guard 6 hours prior and post entering and leaving Icelandic waters and during their time within Icelandic waters. Landings were previously permitted at authorised foreign ports, but this is no longer the case following Regulation No. 745/2016 (Article 1)[101]. | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[100] http://www.ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2018/cod.2127.1f14_SA.pdf
[101] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0745-2016

### 10.1.2.5. Clause 1.2.5.

In the course of research and stock assessment, relevant traditional, fisher and/or community information and/or knowledge shall be sought by the researchers through appropriate means/fora.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**There is close communication between scientists and the fishing industry, both in formal meetings and through informal contact. There are specific consultation groups between fishermen and the MRFI that meet annually in December allowing fishermen (captains) to describe the fishing experience of the year and make comparisons with those previously. Logbooks are compulsory. Their information is not used directly in the stock assessment but is important fishing information for both managers and scientists.**

There is close communication between scientists and the fishing industry, both in formal meetings and through informal contact. Being a small nation, the Icelandic society is quite transparent. For example, in consultations, several institutions, both in industry and management, often emphasize the value of direct communication and of knowing people. Over time, relevant traditional, fisher and/or community information and/or knowledge has been and continues to be integrated in the knowledge base of the fishery resulting in a dynamic evolution of its management.

There are specific consultation groups between fishermen and the MRFI that meet annually in December allowing fishermen (captains) to describe the fishing experience of the year and make comparisons with those previously. MFRI also publishes short newsletters regularly providing up-dates on stock analysis and related research outcomes.

Logbooks are compulsory (Regulation Nr. 746/2016). Generally, they are electronic and assembled by the Directorate; the smallest vessels can still use logbooks on paper. The logbook contains information about position, gear, time, duration and catch for each fishing operation, as well as by-catches of birds and mammals (this area is subject to improvement), and where the fish is landed. This information is not used directly in the stock assessment but is important information and background material for both managers and scientists.

| | |
|---|---|
| **References:** | As referenced within text. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.2.6. Clause 1.2.6.

There shall be active collaboration with international scientific organisations, with the aim of ensuring that the focus is on internationally acknowledged research and assessment methods that provide the best available information on the condition of the stock under consideration at any time.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Iceland is member of ICES, which is a key forum for scientific and management activities and cooperation. Iceland cooperates with several international organisations, in particular NEAFC and NAFO. Furthermore, the Icelandic government has cooperation agreements with Norway, Russia, Greenland, EU and the Faroe Islands.**

**Evidence:**
Iceland is member of ICES, which is a key forum for scientific and management activities and cooperation. The cooperation includes:

- Routine stock assessments and management advice for many commercial stocks, including cod.
- Quality control of assessment standards and management plans.
- For decades, Icelandic scientists have had a high standing within ICES on development of assessment methods and computing tools as well as standards for precautionary management.
- Participation in the broad scientific community in ICES.

The publication record of MFRI clearly shows broad international cooperation on published scientific work.[102]

Iceland actively cooperates with several international organisations, in particular NEAFC and NAFO. Furthermore, the Icelandic government has cooperation agreements with Norway, Russia, Greenland, EU and The Faroe Islands. These are bilateral fisheries agreements as well as control agreements and agreements regarding catch information and information on fisheries and the monitoring of fishing activity through satellite driven vessel monitoring systems (VMS)[103].

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

102 https://www.hafogvatn.is/is/midlun/utgafa/ritaskra
103 http://www.fiskistofa.is/english/international-cooperation/

### 10.1.2.7. Clause 1.2.7.

In cases where the stock under consideration is a shared stock or a straddling stock or a highly migratory stock, there shall be scientific cooperation at the relevant bilateral, regional or international level for obtaining data and/or conducting stock assessments and/or providing advice, as appropriate.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The cod in ICES Division 5a (Icelandic waters) is regarded as a separate stock and managed as such by Iceland. Stock assessment and evaluation of the management plan is done in cooperation between interested nations within the NWWG in ICES.** | | | | |
| **Evidence:**<br>The Icelandic cod stock is not considered a shared stock by scientist or managers, although there can be some traffic of larvae from Iceland to Greenland and occasional migrations of adult fish from Greenland to Iceland. Stock assessment is carried out in cooperation between the interested nations within the NWWG in ICES. This is also the case for the evaluation of management plan. | | | | |
| **References:** | See footnotes. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

### 10.1.3. Clause 1.3. Stock under Consideration, Harvesting Policy and the Precautionary Approach

#### 10.1.3.1. Clause 1.3.1. The Precautionary Approach

##### 10.1.3.1.1. Clause 1.3.1.1.

The precautionary approach[104] shall be implemented to protect the stock under consideration.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**The precautionary approach is implemented through a harvest rule that implies low risk of stock depletion.**

**Evidence:**

Over time, the Icelandic cod harvest rate (and fishing mortality) have decreased, in particular after the introduction of the present harvest rule in 2009. Since 2010, when the present harvest rule was introduced, the estimated harvest rate has been at or below 0.22, and since 2014, it has been at or below the target value of 0.20. This is further illustrated by the increased fraction of large fish in the catches.

The precautionary approach is implemented through a harvest rule that implies low risk of stock depletion. It has been tested and found precautionary by ICES. ICES assessed that fishing pressure on the stock is below HRMSY, Fpa, and Flim. Spawning stock size is above MSY Btrigger, Bpa, and Blim.[105].

**Table 7**. Cod in Division 5.a. State of the stock and fishery relative to reference points.

| | Fishing pressure | | | | Stock size | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2016 | 2017 | 2018 | | 2017 | 2018 | 2019 |
| Maximum sustainable yield | $HR_{MSY}$ | ✓ | ✓ | ✓ Below | $MSY\ B_{trigger}$ | ✓ | ✓ | ✓ Above trigger |
| Precautionary approach | $F_{pa}$,$F_{lim}$ | ✓ | ✓ | ✓ Harvested sustainably | $B_{pa}$,$B_{lim}$ | ✓ | ✓ | ✓ Full reproductive capacity |
| Management plan | $HR_{MGT}$ | ✓ | ✓ | ✓ Within expected range | $MGT\ B_{trigger}$ | ✓ | ✓ | ✓ Above |

The harvest rate of 0.2 is associated with a probability of bringing SSB below 220000 tonnes slightly below 5%. The harvest rate in the management plan (0.20) is relatively conservative, providing a near maximum yield with a high mean SSB.

The precautionary management of Icelandic cod is further detailed in the clauses below.

| | |
|---|---|
| **References:** | N/A. |
| **Non-Conformance Number (if relevant)** | **NA** |

104 Referring to clause 29.6 of the FAO Eco-labelling Guidelines for Fish and Fishery Products from Marine Capture Fisheries

105 http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

### 10.1.3.1.2. Clause 1.3.1.2.

The stock under consideration shall not be overfished to a level causing recruitment overfishing[106].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence: The Icelandic stock is not overfished. ICES has defined a limit SSB (Blim) at 125000 tonnes, which is considered to be sufficient for normal recruitment. Reaching that limit is unlikely with the present harvest rule.**

**Evidence:**

Between 2016 and 2018 ICES assessed that fishing pressure on the Icelandic stock in is below HRMSY, Fpa, and Flim, and spawning stock size is well above MSY Btrigger, Bpa, and Blim.[107] The stock is not overfished or experiencing overfishing. Current SSB in 2019 is estimated to be above 600000 tonnes.

ICES has defined a limit SSB (Blim) at 125000 tonnes. It is the lowest observed SSB in the assessed time series, in 1993. Around 1990 there was a shift towards lower recruitments, (about 30% reduction on average, Figure 35), which does not seem to be associated with a lower SSB. In recent years, SSB has increased without a corresponding increase in recruitment. Therefore, at an SSB above the Blim, recruitment fluctuations do not seem to be associated with the level of SSB.

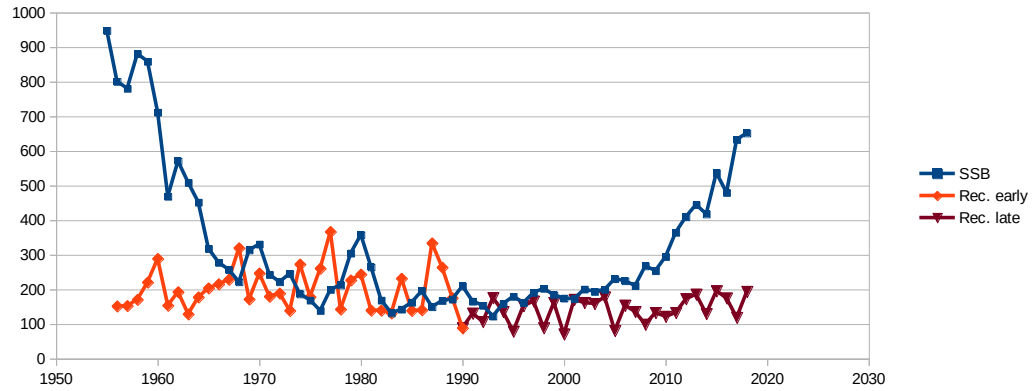



**Figure 35.** The time series of SSB and recruitment according to the 2019 assessment. The recruitment series is split in two in 1990, to highlight the altered recruitment regime in recent decades.

Reaching the limit SSB is unlikely with the present harvest rule, even with the present low recruitment regime. In the simulations done when the harvest rule as introduced (AGICOD 2010), the risk of falling below the rebuilding target SSB = 220 000 tonnes just exceeded 5% if both a low recruitment regime and slow growth were assumed. The risk of falling below Blim is considerably lower. SSB has increased markedly since then, and is now about 3 times that of the target.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

106 The 'stock under consideration' is not overfished if it is above the associated limit reference point (or its proxy)." FAO Guidelines (2009), par. 30.1.

107 http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

### 10.1.3.1.3. Clause 1.3.1.3.

Relevant uncertainties shall be taken into account through a suitable method of risk assessment.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The harvest rule that is used for deciding quotas for cod was tested by simulation, taking the relevant sources of uncertainty into account.**

**Evidence:**

The harvest rule that is used for deciding quotas for cod was tested for risks and uncertainties by simulation[108] . The simulations were done as a bootstrap simulation, where all relevant uncertainties were represented by distributions, based on the experience with stock dynamics and assessment performance. The uncertainties applied in the simulation were:

- Recruitment, either assuming evenly distributed variation within the recent range (70–180 millions) or according to a Ricker function with mean age of the spawning stock as a covariate, assuming a lognormal error with CV = 0.4 and no autocorrelation.
- Weights at age: Log-normally distributed with CV = 0.12) with mean derived from the period 2006-2008, and with autocorrelation 0.6. was a conservative assumption and implied that the weights at age were below the historical low in about 50% of the cases.
- Assessment error: Lognormally distributed (CV = 0.15, with autocorrelation 0.45) with a bias of 10%, derived from the discrepancies between the present perception of historical B4+ (for the period 1990–2005) and the perceived B4+ in the assessment performed in each of those years. It may be noted that since then, the retrospective error has been far smaller (see also Clause 1.2.3)
- Initial numbers: Consistent with those estimated by NWWG in 2009 (ICES, 2009a), with deviations according to the variance-covariance estimates from that assessment. As in previous harvest rule evaluations, these stochastic terms were inflated to give a CV of the initial B4+ in line with that of the assessment error.

Natural mortality (0.2), maturation at age (average over 2006–2008) and selection at age (representative of the period 1994–2008) in the fishery were assumed constant without error.

This procedure is a standard way of evaluating harvest rules in ICES and elsewhere.[109] The harvest rule was found to give a high (>95% except when all pessimistic assumptions were combined) probability of staying above 220 000 tones, which was the target at the time. This is stronger than the requirement for being in

108 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2010/Special%20Requests/Icelandic%20cod%20management%20plan.pdf

109 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKGMSE/Report%20of%20the%20Workshop%20on%20Guidelines%20for%20Management%20Strategy%20Evaluations.pdf

| | |
|---|---|
| accordance with the precautionary approach, according to the rules practiced by ICES. These rules imply a low probability of bringing the stock below Blim.[110] | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

110 Section 1.2.6 in http://www.ices.dk/community/advisory-process/Pages/Basis-for-ICES-Advice.aspx

### 10.1.3.1.4. Clause 1.3.1.4.

Appropriate reference points shall be determined and remedial actions to be taken if reference points are approached or exceeded shall be specified[111].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**ICES has defined reference points for Icelandic cod that have been adopted by MFRI. The harvest rule prescribes a reduction in the harvest rate if SSB goes below a trigger value of 220 000 tonnes. With the current stock dynamics and harvest rule, this situation is unlikely. Further measures if SSB gets too low would depend on the reason why the SSB became reduced. The Icelandic management has the authority to take the necessary action.**

**Evidence:**

ICES has defined reference points for cod, that have been adopted by MFRI. The values and their justification is listed below:

| Nálgun<br>*Framework* | Gátmörk<br>*Reference point* | Gildi<br>*Value* | Grunnur<br>*Basis* |
|---|---|---|---|
| Aflaregla<br>- MSY nálgun<br>*Management plan*<br>*- MSY approach* | MSY $B_{trigger}$ | 220 000 t | Aðgerðarmörk í aflareglu sem standast MSY viðmið ICES<br>*Trigger point in HCR considered consistent with ICES MSY framework* |
| | $HR_{MSY}$ | 0.2 | Slembireikningar í aflareglu hermun. Prósenta af viðmiðunarstofni<br>*Stochastic HCR evaluation. Percentage of age 4+ biomass* |
| Varúðarnálgun<br>*Precautionary approach* | $B_{lim}$ | 125 000 t | $B_{loss}$ |
| | $B_{pa}$ | 160 000 t | $B_{pa} = B_{lim}$ x exp (1.645σB); σB = 0.15 |
| | $F_{lim}$ | 0.74 | Veiðidánartala sem leiðir til þess að hrygningarstofn er yfir $B_{lim}$ með 50% líkum<br>*Equilibrium F which will maintain the stock above $B_{lim}$ with a 50% probability* |
| | $F_{pa}$ | 0.58 | 95% líkur á að veiðidánartala sé undir $F_{lim}$<br>$F_{pa} = F_{lim}$ x exp (-1.645σF); σF = 0.15<br>*95% probability that true F is below $F_{lim}$*<br>*$F_{pa} = F_{lim}$ x exp (-1.645σF); σF = 0.15* |

The Blim is the lowest value of SSB on record. This is the SSB in 1993.

A precautionary biomass reference point ($B_{pa}$ = 160 000 t) was set by ICES in 2016 but has no impact on the management as the management plan does not prescribe any particular action if that level is passed. It was set according to ICES standard practice as a safety margin around the limit reference point, assuming a CV of 15% on the assessment biomass[112].

ICES has set (in 2016) a limit fishing mortality ($F_{lim}$) at 0.74 and a precautionary fishing mortality ($F_{pa}$) at 0.58. The limit is the fishing mortality that will lead to SSB at $B_{lim}$ in equilibrium, and the $F_{pa}$ represents a safety margin to that assuming a CV of the assessment error of 15%. None of these are used in the harvest rule,

111 FAO Code of Conduct for Responsible Fisheries, Article 7.5.2.

112 Same as above.

as the fishing mortality corresponding to the rule is far lower (about 0.30 - 0.35, depending on the age composition and weights at age).

The harvest rule is to derive a TAC corresponding to a harvest rate of 0.2. This standard HR is reduced if SSB is estimated below the Btrigger = 220 000 tonnes, which originally was a rebuilding target but has been retained as a convenient safety measure. The efficiency of this measure has not been tested extensively, as the need for this reduction is very unlikely with the stock dynamics and uncertainties that were assumed in the simulation. Further measures would depend on the reason why the SSB became reduced. The Icelandic management has the authority to take the necessary action.

The HR = 0.2 is slightly below the HR corresponding to the highest long-term yield. The production curve is almost flat on the top, so the loss by applying this conservative harvest rate is minor. On the other hand, the gain in terms of higher SSB is quite large.

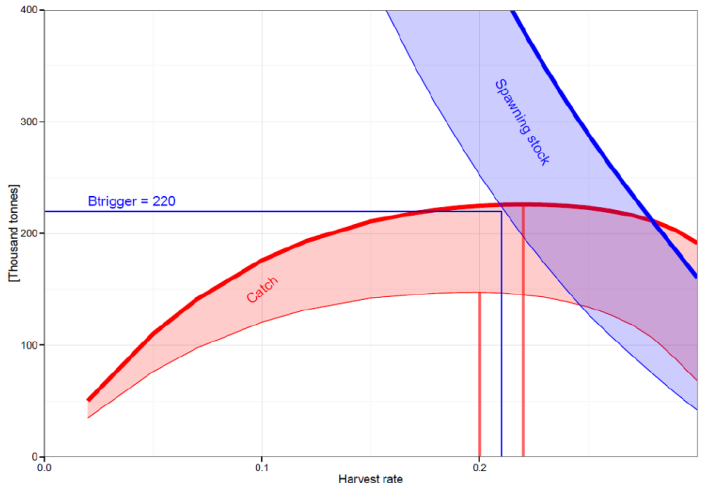



**Figure 36.** Stochastic equilibrium yield and SSB as function of harvest rate.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.3.1.5. Clause 1.3.1.5.

The long-term harvesting policy shall be stated in the Fisheries Management Plan.

| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
|---|---|---|---|---|
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The management strategy for Icelandic fish stocks, in general, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term. This also appears as the objective of the management plan for cod.**

**Evidence:**

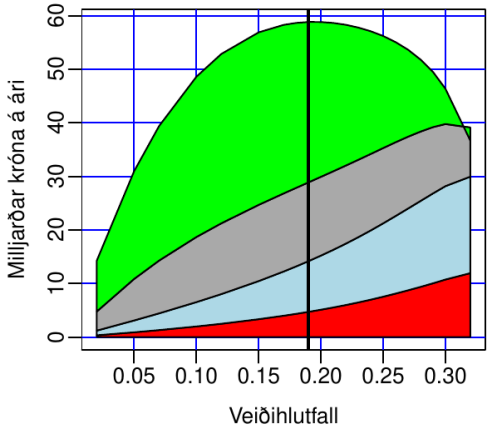
The Government of Iceland has issued the following general statement on management plans[113]:

*The management strategy for Icelandic fish stocks, in general, is to maintain the exploitation rate at the level which is consistent with the Precautionary Approach and that generates maximum sustainable yield (MSY) in the long term. Harvest Control Rules (HCR) are set by the managers of the fishery, in the case of Iceland by the government and are based on knowledge on the state of the stock and take account of the managers objectives, the nature of the resource and uncertainties. The main aim HCRs is thus to:*

- *Decrease the risk of short-term interests influencing the level of exploitation.*
- *Ensures that the available information on the resource are used in the most rigorous manner.*
- *Long term sustainable yield*
- *Ensure that stock is above save biological limits*
- *Often include buffers on the amount of Catch/TAC change between fishing seasons.*

The specific rule for cod has the policy statement: *The management strategy for Icelandic cod is to maintain the exploitation rate at the rate which is consistent with the precautionary approach and that generates maximum sustainable yield (MSY) in the long term.*

The agreed harvest rate has been shown to provide near maximum economic yield[114] as illustrated below.




113 https://www.government.is/news/article/?newsid=cf30e5ad-584f-11e8-9429-005056bc4d74

114 http://www.hafro.is/images/HCR_Evaluations/iCod_endurskodun_a_aflareglu_2014.pdf

| | |
|---|---|
| **Figure 37.** Economic parameters as function of harvest rate (veiðihlutfall). The vertical line indicates harvest rate with maximum profit. Green: Gross income; Grey: Profit; Blue: Vessel expenses; Red: Fuel expenses. | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.3.1.6. Clause 1.3.1.6.

The Fisheries Management Plan shall specify how the precautionary approach shall be implemented for the stock under consideration.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**The harvest rate according to the harvest rule of 0.2 implies a low probability of bringing the SSB below Blim, which is the biomass below which recruitment is impaired or stock dynamics unknown. An additional measure is to apply a reduced harvest rate if SSB goes below a trigger level of 220 kt.**

**Evidence:**
Following ICES practise[115], implementing the precautionary approach in a management plan would imply to ensure a low probability of bringing the spawning biomass to a point (expressed as Blim) where recruitment may be impaired, or stock dynamics is unknown (as is the case for Blim for cod).

For Icelandic cod, this is achieved by applying a target harvest rate according to the harvest rule of 0.20, which has been demonstrated by simulations taking relevant uncertainties into account, to imply a low probability (<0.05) of bringing the SSB below Blim. An additional measure is to apply a harvest rate below this value if SSB is below a trigger level of 220 kt.

The annual Total Allowable Catch (TAC) is set by a Harvest Control Rule (HCR). The rule is based on the mean of the TAC in the current year ($TAC_{y-1/y}$) and 20% ($HR_{MGT}$) of the biomass of 4 year and older cod ($B_{4+,y}$) in the assessment year ($y$). The TAC for the fishing year $y/y+1$ (September 1 of year $y$ to August 31 of year $y+1$) is calculated as follows:

$$TAC_{y/y+1} = (HR_{MGT} * B_{4+,y} + TAC_{y-1/y})/2$$

In the official document[116], the formula is: $TAC_{y/y+1} = HR_{MGT} * (B_{4+,y} + TAC_{y-1/y})/2$
This is looks like a typing error (first bracket mis-placed) as it will lead to a higher harvest rate than intended if taken literally.

The rule for reducing the harvest rate is specified differently in different source documents.

*Official: $HR_{MGT} * SSB / MGT\ B_{trigger} * (B_{4+,y} + TAC_{y-1/y})/2$, where the first bracket probably is mis-placed*

115 Section 1.2.6 in http://www.ices.dk/community/advisory-process/Pages/Basis-for-ICES-Advice.aspx
116 https://www.government.is/news/article/?newsid=cf30e5ad-584f-11e8-9429-005056bc4d74

*ICES advice:* $TAC_{y/y+1} = (SSB / MGT\ B_{trigger} * HR_{MGT} * B_{4+,y} + TAC_{y-1/y})/2$, *which would be equal to the official if the misplaced first bracket is corrected.*

*NWWG:* $TAC_{y/y+1} = SSB / MGT\ B_{trigger} * (HR_{MGT} * B_{4+,y} + TAC_{y-1/y})/2$.

This rule was not explicitly tested when the harvest rule was first evaluated, as it would be very unlikely that it would be invoked. It has never been needed in subsequent years.

In accordance with the general aims of the management strategy for cod, the HCR was adopted by the Icelandic authorities in June 2009 for a period of 5 years (Letter from the Ministry of Fisheries and Agriculture to ICES dated May 23rd, 2009). In 2015 the plan was extended until 2020 (Letter from the Ministry of Industry and Innovation to ICES dated June 2nd, 2016).

| | |
|---|---|
| **References:** | See footnotes. |

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

### 10.1.3.2. Clause 1.3.2. Management targets and limits

#### 10.1.3.2.1. Clause 1.3.2.1. Harvesting rate and fishing mortality

##### 10.1.3.2.1.1. Clause 1.3.2.1.1.

The management target for fishing mortality (or its proxy) and the associated limit reference point, as well as the management action to be taken when the limit reference point is exceeded, shall be stated in the Fisheries Management Plan[117].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The management target for the harvest rate is 0.2. Harvest rate is regarded as a proxy for fishing mortality According to the rule, the target harvest rate shall be reduced if SSB in the assessment year is estimated below Btrigger = 220 000 tonnes.** | | | | |
| **Evidence:**<br>The management target for the harvest rate is 0.2. Harvest rate is regarded as a proxy for fishing mortality, although the correspondence depends to some extent on the age composition of the stock. The target harvest rate of 0.2 corresponds roughly to a fishing mortality around 0.3 - 0.35. According to the rule, the target harvest rate shall be reduced if SSB in the assessment year is estimated below Btrigger = 220 000 tonnes[118]. In case of exceeding the limit point, the action according to the plan would be to continue to apply the decided harvest rate, which corresponds to a fishing mortality far below any candidate limit fishing mortality. | | | | |
| **References:** | See footnotes. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

117 $F_{lim}$ can be explicit or implicit in cases where harvest rate is set annually to a precautionary $F_{target}$ (or its proxy)

118 https://www.government.is/news/article/2018/05/15/Haddock/

#### 10.1.3.2.1.2. Clause 1.3.2.1.2.

If fishing mortality (or its proxy) is above the limit reference point, management actions shall be taken to decrease the fishing mortality (or its proxy) below the limit reference point[119].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**There are no explicit measures planned for the event that fishing mortality shall exceed the F limit. The limit is so high that reaching it when setting TACs according to the target is extremely unlikely.** | | | | |
| **Evidence:**<br>A limit fishing mortality has been defined by ICES at 0.74, and a precautionary value that provides a safety margin is set at 0.58. These are much higher than the fishing mortality corresponding to the target harvest rate, which would be around 0.3 - 0.35. There are no measures planned for the event that harvest rate shall exceed the HR limit, except to apply the target harvest rate again. The limit is so high that reaching it when setting TACs according to the target is extremely unlikely. If that should happen, the only sensible response would be to invoke a full revision of the management of cod. The government has the authority to do so. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

119 FAO Guidelines (2009), par. 30.2. See also: The 'stock under consideration' is not overfished if it is above the associated limit reference point (or its proxy)." FAO Guidelines (2009), par. 30.1.

#### 10.1.3.2.2. Clause 1.3.2.2. Stock Biomass

##### 10.1.3.2.2.1. Clause 1.3.2.2.1.

The long term management target for stock size (biomass), either explicit or implicit depending on management approach, consistent with the objective of promoting optimum utilization, shall be specified.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**A long-term target for the stock size is considered redundant and not defined.** | | | | |
| **Evidence:**<br><br>A long-term target for the stock size is not defined[120]. It is considered redundant as the management target is a harvest rate that is expected to lead to a biomass fluctuating safely above the precautionary biomass limit. The target fishing mortality has been demonstrated to provide a long term yield close to the MSY. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

[120] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

#### 10.1.3.2.2.2. Clause 1.3.2.2.2.

Limits or directions for stock size (or its proxy) with respect to precautionary management, consistent with avoiding recruitment overfishing, shall be specified.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**A precautionary limit biomass has been defined as SSB = 125000 tonnes, above which there is no indications of impaired recruitment** | | | | |
| **Evidence:**<br>A precautionary limit biomass Bpa has been defined as SSB = 125000 tonnes, and a trigger point in the harvest rule as SSB = 220000 tonnes. The limit value is the lowest SSB observed, and there has been no clear indications of recruitment failure at that level. Simulations demonstrate a very low risk of reaching the SSB limit with the target harvest rate. The biomass limit is discussed in more detail under clauses 1.3.1.4 | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

#### 10.1.3.2.2.3. Clause 1.3.2.2.3.

The stock (biomass) limit reference point ($B_{lim}$) shall be developed in accordance with internationally accepted practice.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The procedure applied when setting reference points follows ICES standards and the results were accepted by ICES.** | | | | |
| **Evidence:**<br>The limit value is the lowest SSB observed, and there has been no clear indications of recruitment failure at that level. The background for Blim is described in detail in Clause 1.3.1.4. This procedure follows ICES standards[121] and the result was accepted by ICES. | | | | |
| **References:** | See footnote. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

121 http://ices.dk/sites/pub/Publication%20Reports/Guidelines%20and%20Policies/12.04.03.01_Reference_points_for_category_1_and_2.pdf

#### 10.1.3.2.2.4. Clause 1.3.2.2.4.

Should the estimated stock size approach $B_{lim}$ (or its proxy), then appropriate management action shall be taken with the objective of restoring stock size to levels above $B_{lim}$ (or its proxy) with high probability within a reasonable time frame.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The harvest rule prescribes a reduction in the target fishing mortality if SSB is below a trigger value of 220000 tonnes with the objective of restoring stock size to levels above $B_{lim}$. Simulations demonstrate that approaching Blim would be very unlikely unless something happens that was not foreseen in the simulations. If so happens, further measures to be taken should be adapted to the underlying cause.** | | | | |
| **Evidence:**<br>Already if SSB falls below the trigger point at 220000 tonnes, the fishing mortality according to the rule is reduced linearly towards the origin with the objective of restoring stock size to levels above $B_{lim}$. According to the simulations done when evaluating the harvest rule, approaching Blim would be very unlikely unless something happens that was not foreseen in the simulations. If so happens, further measures to be taken should be adapted to the underlying cause. The government has the legal instruments to take action as needed. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

### 10.1.3.2.3. 1.3.2.3. Stock biology and life-cycle (structure and resilience)

#### 10.1.3.2.3.1. Clause 1.3.2.3.1.

Information on the biology, life-cycle and structure of the stock shall be taken into account when designing management measures to promote optimal utilisation of the stock with respect to resilience to natural variability and fishing[122].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The harvest rule was designed to provide a near maximum long-term yield and a stock abundance safely away from the limit.** | | | | |
| **Evidence:**<br>The harvest rule was designed to provide a near maximum long-term yield and a stock abundance safely away from the limit. The target fishing mortality is set on the low side of the plateau associated with maximum yield, (see Figures under Clause 1.3.1.4) which provides a buffer biomass against natural variations in productivity and ensures near maximum yield with a minimum fishing pressure. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

122 From FAO Guidelines (2009), para 30.3. The structure and composition of the "stock under consideration" which contribute to its resilience are taken into account.

#### 10.1.3.2.3.2. Clause 1.3.2.3.2.

Consideration shall be given to measures designed to avoid excessive exploitation of spawning components at spawning time, as appropriate, especially at times when biomass (SSB) may approach the level of the limit reference point ($B_{lim}$)123.

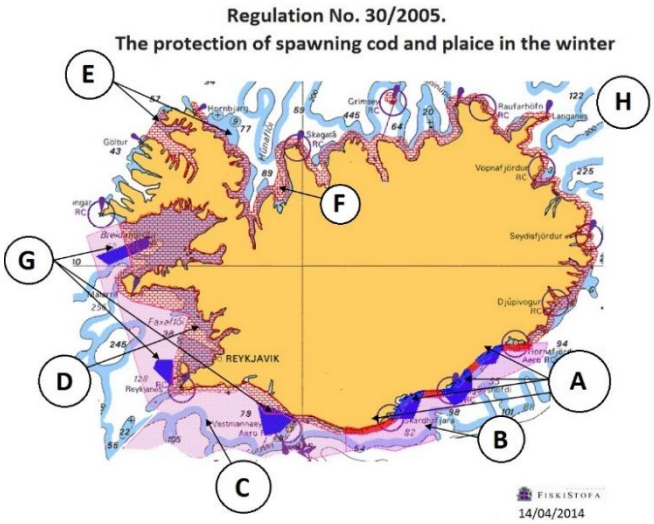
| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**There is an extensive system of closures to protect both spawners at spawning time and juveniles.**

**Evidence:**
There is an extensive system of closures to protect both spawners at spawning time and juveniles.

Area closures can be permanent or temporary. Permanent closures can be to protect spawners or juveniles, or to protect vulnerable habitats. Temporary (short term) closures are mostly to protect juveniles.

Some closures are designed to avoid exploitation of cod at the spawning grounds in the spawning season. They are permanent according to regulations but apply only in the spawning season (Figure 38). These overlap to a fair extent with the known spawning grounds for cod (Figure 39). Other permanent closures are for certain gears, mostly all around the year (Figure 40).




**A.** Regulation No. 30/2005. Eastern Region Article 1. 1 and 2. April 8th through April 16th

**B.** Regulation No. 30/2005. Eastern Region Article 1.3. Amended by Regulation No. 225/2007. April 17th to 10:00 April 28th

**C.** Regulation No. 30/2005. Western Article 2.4. Amended by Regulation No. 225/2007. April 12th to 10:00 April 21st

**D.** Regulation No. 30/2005. Western Article 2. Paragraphs 1, 2 and 3. April 1st through April 11th

**E.** Regulation No. 30/2005 Northern and Eastern Regions, Article 3. A, B and C amended by Regulation No. 380/2008 from April 15th to 10:00 April 30th (A, B and C).

**F.** Regulation No. 30/2005. Northern and Eastern Regions, Article 3. D amended by Rgl. 380/2008 from 15th April to time 10:00 April 30th (D).

**G.** Regulation No. 30/2005. Article 4 Plaice Area. Closures April 1st to April 30th

**H.** Regulation No. 30/2005. Article 5 exemptions. Article worded so that notwithstanding the provisions of Articles 1 to 4 fishing sea cucumbers, lumpfish, inshore shrimp, scallops, sea urchins, whelk, ocean quahog and rearing of cod is permitted provided requisite licenses for the relevant area are obtained. (Amended by Regulation No. 289/2010)

**Figure 38.** Cod and plaice spawning protections.

123 FAO Guidelines (2009), par. 30.3.

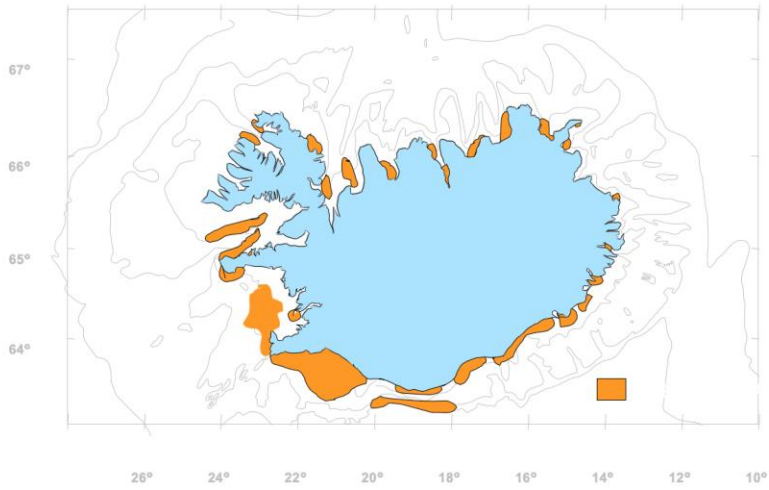



**Figure 39.** Spawning grounds for cod.

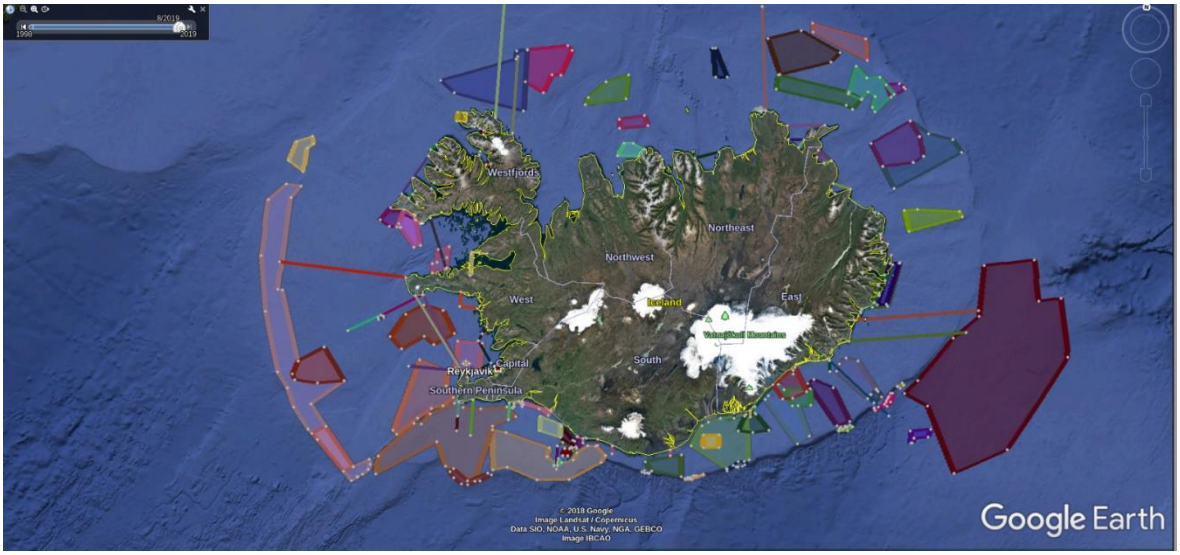



**Figure 40.** Screenshot of an example of interactive maps available from the Directorate.[124] Clicking on a marked field gives a listing of coordinates, legal basis and other issues of interest.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

124http://www.fiskistofa.is/fiskveidistjorn/veidibann/reglugerdarlokanir/ This site has a link to maps in Google earth which provide very detailed information on locations of interest.

#### 10.1.3.2.3.3. Clause 1.3.2.3.3.

Consideration shall be given to relevant measures designed to limit fishing mortality of juvenile fish, with the objective to protect juveniles, to reduce the likelihood of growth overfishing and increasing the contribution of year classes to the spawning stock of the stock under consideration.

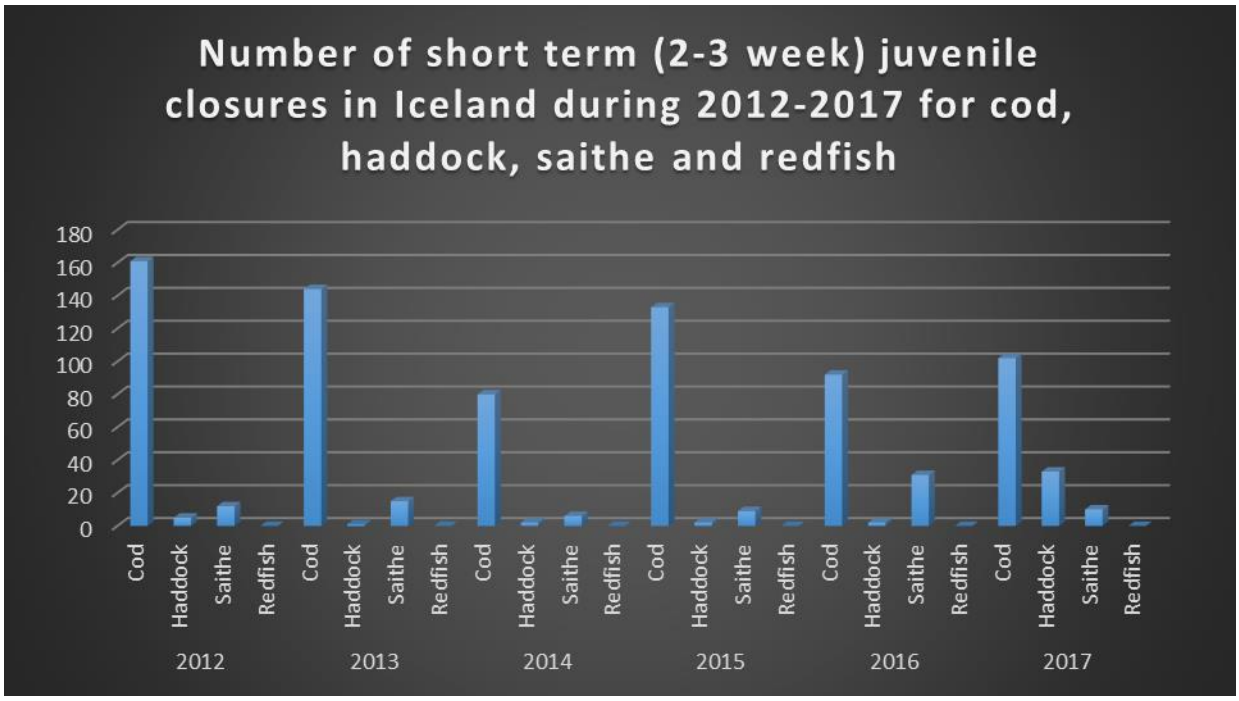
| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**There is a system for protecting juveniles by closing areas temporarily on short notice, if there appears too much juveniles in catches. Furthermore, there are mesh size regulations in place to protect juveniles; the standard mesh size in trawl is 135 mm, and fishing with trawls is prohibited in large areas near the coast which serve as spawning and nursery areas. Sorting grids in fishing gear are obligatory in certain fisheries to prevent catches of juvenile fish.**

**Evidence:**

In addition to closures that are permanent or regular (See Clause 1.3.2.3.2), there is a system for protecting juveniles by closing areas temporarily on short notice. These are triggered by finding too much juveniles in catches. They are managed by the MFRI, often at the advice from the Coast Guard or the fishing fleet, applied on few hours' notice and normally valid for 2 weeks. They are published in several channels, including on the web[125]. If an area is closed via temporary closures more than 3 times, MFRI may decide to make it a permanent closure. The juvenile thresholds for closing areas are: cod 25% under 55 cm, haddock 30% under 45 cm, saithe 30% under 55 cm, redfish 20% under 33 cm.




125 https://www.hafogvatn.is/is/skyndilokanir

**Figure 41.** Short term closures (e.g. 2-3-week closures) implemented in Icelandic waters to protect juveniles of cod, haddock, saithe and redfish from 2012 to 2017. Source MFRI, provided during the 2018 site visits.

Furthermore, there are mesh size regulations in place to protect juveniles; the standard mesh size in trawl is 135 mm[126]. There is a minimum size of cod at 55 cm. If smaller cod is caught, it still must be landed and sold, but special rules apply for payment to encourage landing, but discourage catching of undersized fish. Most of the payment goes to a fund for promoting science and only a minor part to the fisher. These catches are only partially subtracted from the quota.

Fishing with trawls is prohibited in large areas near the coast which serve as spawning and nursery areas. Sorting grids in fishing gear are obligatory in certain fisheries to prevent catches of juvenile fish.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

126 https://www.reglugerd.is/media/vidhengi/nr_543_2002.doc

### 10.1.4. Clause 1.4. External Scientific Review

#### 10.1.4.1. Clause 1.4.1.

For the stock under consideration the harvesting policy (including its consistency with the precautionary approach), stock assessments and advice shall be reviewed, by request from the fisheries management authorities at appropriate, regular intervals as well as when substantive changes are made in harvesting policy by an appropriate international scientific body or committee.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**ICES is regarded as the relevant scientific body that organizes stock assessments and performs evaluations of management plans. The assessment as well as the management plan were revisited in 2015 and approved without changes. A re-evaluation of assessment methods and management plan is planned in 2021.** | | | | |
| **Evidence:**<br>ICES is regarded as the relevant scientific body. It organizes stock assessments, performs evaluations of management plans and advises on a wide range of issues within marine science, including fisheries management. The assessment as well as the management plan for cod were evaluated and approved in 2010. The assessment as well as the management plan were revisited in 2015[127] and approved without changes. The approved procedures have been followed since then. A re-evaluation of assessment methods and management plan is planned in 2021. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

[127] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

### 10.1.4.2. Clause 1.4.2.

Following external scientific review, the competent fisheries management authority shall review and/or revise the harvesting policy, taking into consideration the external review, as appropriate.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The Icelandic management authorities decides the harvesting policy, including the management plan. It takes advice form the MFRI as well as from the industry and fishermen.** | | | | |
| **Evidence:**<br>The Icelandic management authorities (Ministry of Industries and Innovation) decides the harvesting policy, including the management plan. It takes advice from the MFRI as well as from the industry and fishermen. The MFRI advice generally follows the ICES advice unless there are strong reasons to deviate from it. Since 2010 the TAC has been set according to ICES advice[128]. The last harvest policy review was performed in 2015[129]. Managers and MFRI will seek the advice from ICES when revising harvesting policy. For cod, a revision of the ICES assessment and advice is planned for 2021. | | | | |
| **References:** | See footnote. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

[128] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

[129] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKICE%202015/wkice_2015_final.pdf

### 10.1.5. Clause 1.5. Advice and Decisions on TAC

#### 10.1.5.1. Clause 1.5.1.

A competent scientific body, research institute, designated advisory body or arrangement shall provide the competent fisheries management authority with fisheries advice on the harvesting of the stock under consideration, in a timely manner.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The stock assessment and advice for the TAC in the coming year is provided annually by ICES. The MFRI provides advice to the Ministry, which is the competent fisheries management authority.** | | | | |
| **Evidence:**<br>The stock assessment and advice for the TAC in the coming year is provided annually by ICES in June, based on stock assessments in the North-Western Working Group where Icelandic scientists take part. Based on that, the MFRI provides advice to the Ministry, which is the competent fisheries management authority. Normally, the MFRI advice will be identical to the ICES advice. Since 2010 the TAC has been set according to ICES advice[130]. The ICES advice is published on the ICES websites and the MFRI advice is published on the MFRI website[131] in June each year. | | | | |
| **References:** | See footnote. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

[130] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf
[131] https://www.hafogvatn.is/en/harvesting-advice

### 10.1.5.2. Clause 1.5.2.

Advice shall include the appropriate value(s) for precautionary reference points.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The advice published by the MFRI has reference points tabulated. These are identical to the reference points defined by ICES, and include the reference values in the harvest rule in the management plan.**

**Evidence:**

The advice published by the MFRI[132] has reference points tabulated (copied below). These are identical to the reference points defined by ICES, and include the reference values in the harvest rule in the management plan.

| Nálgun<br>*Framework* | Gátmörk<br>*Reference point* | Gildi<br>*Value* | Grunnur<br>*Basis* |
|---|---|---|---|
| Aflaregla<br>- MSY nálgun<br>*Management plan*<br>*- MSY approach* | MSY $B_{trigger}$ | 220 000 t | Aðgerðarmörk í aflareglu sem standast MSY viðmið ICES<br>*Trigger point in HCR considered consistent with ICES MSY framework* |
| | $HR_{MSY}$ | 0.2 | Slembireikningar í aflaregluhermun. Prósenta af viðmiðunarstofni<br>*Stochastic HCR evaluation. Percentage of age 4+ biomass* |
| Varúðarnálgun<br>*Precautionary approach* | $B_{lim}$ | 125 000 t | $B_{loss}$ |
| | $B_{pa}$ | 160 000 t | $B_{pa} = B_{lim}$ x exp (1.645σB); σB = 0.15 |
| | $F_{lim}$ | 0.74 | Veiðidánartala sem leiðir til þess að hrygningarstofn er yfir $B_{lim}$ með 50% líkum<br>*Equilibrium F which will maintain the stock above $B_{lim}$ with a 50% probability* |
| | $F_{pa}$ | 0.58 | 95% líkur á að veiðidánartala sé undir $F_{lim}$<br>$F_{pa} = F_{lim}$ x exp (-1.645σF); σF = 0.15<br>*95% probability that true F is below $F_{lim}$*<br>*$F_{pa} = F_{lim}$ x exp (-1.645σF); σF = 0.15* |

| | |
|---|---|
| **References:** | See footnote. |
| **Non-Conformance Number (if relevant)** | **NA** |

132 Advice published June 2018: https://www.hafogvatn.is/static/extras/images/%C3%9Eorskur_2018729230.pdf

### 10.1.5.3. Clause 1.5.3.

Decisions on TAC shall be taken by the competent fisheries management authority taking into consideration the entire distribution range of the stock under consideration, as appropriate.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The stock of cod in Iceland is confined to Icelandic waters, thus it is not a shared stock. Decisions on TAC are taken by the Icelandic Ministry of Industries and Innovation.** | | | | |
| **Evidence:**<br>The stock of cod in Iceland is not a shared stock. There is some exchange with cod in East Greenland, but not in a form that requires common management actions. Larvae can drift form Iceland to Greenland, and in some years, adult cod may migrate from Greenland to Iceland[133].<br><br>Decisions on TAC are taken by the Icelandic Ministry of Industries and Innovation. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

[133] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf

### 10.1.5.4. Clause 1.5.4.

For shared stocks the setting of TAC shall take into consideration international agreements and scientific advice.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>The cod stock is not a shared stock, and there are no agreements on its management with neighbouring nations. | | | | |
| **Evidence:**<br>The cod stock is not a shared stock, and there are no agreements on its management with neighbouring nations. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

### 10.1.5.5. Clause 1.5.5.

The competent fisheries management authority shall decide on TAC within the boundaries set by the adopted harvesting policy.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The TAC is set by the Ministry after advice from MFRI and consultations with the industry. The Ministry has the authority to deviate from the advice, but will only do so if there are strong reasons for that. In practice, where harvest rules are in effect, the advice is set according to the rule and the TAC set according to the advice.** | | | | |
| **Evidence:**<br>The TAC is set by the Ministry after advice from MFRI and consultations with the industry. Although the Ministry has the authority to deviate from the advice, it will only do so if there are strong reasons for that. In practise, where harvest rules are in effect, the advice has been according to the rule and the TAC set according to the advice. For cod, this has been the case since the present harvest rule was adopted in 2009/2010[134]. | | | | |
| **References:** | See footnote. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

[134] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

### 10.1.5.6. Clause 1.5.6.

Management measures for conservation and sustainable use of the stock under consideration shall be specified in laws and regulations.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The management of cod is part of the general fisheries management, stated in the suite of rules and regulations applicable to all commercial fisheries in Iceland.** | | | | |
| **Evidence:**<br>As discussed in more detail in Clause 1.1.7 - 1.1.10, the management of cod is part of the general fisheries management, stated in the suite of rules and regulations applicable to all commercial fisheries in Iceland, discussed under Clauses 1.1.1 - 1.1.3.<br><br>A harvest rule is in place for cod, which states how the TAC is calculated based on stock abundance estimated in an analytic stock assessment. The rule has been evaluated and demonstrated to lead to sustainable use of the stock. The rule is *inter alia* published in the government web pages[135]. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

135 https://www.government.is/news/article/?newsid=cf30e5ad-584f-11e8-9429-005056bc4d74

### 10.1.5.7. Clause 1.5.7.

Practical implementation shall be the task of (a) designated competent institution(s).

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The practical implementation of management decisions is the task of the Directorate, which is the executive body that organizes the ITQ system and monitors catches, the Coast guard which is responsible for surveillance and enforcement at sea and the MFRI which performs assessments and provides advice.** | | | | |
| **Evidence:**<br>As described in detail under Clauses 1.1.1-3, the practical implementation of management decisions is the task of the Directorate, which is the executive body that organizes the ITQ system and monitors catches, the Coast guard which is responsible for surveillance and enforcement at sea and the MFRI which performs assessments and provides advice. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

### 10.1.5.8. Clause 1.5.8.

Decisions on TAC in the appropriate units shall be made and implemented in such a way as to ensure that the actual catch is as close to the intended catch as practically possible.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**There is a wide range of measures to ensure that the total catch is in accordance with the decided TAC. However, there is some deviation of final catches from the decided TAC. Legal transfers of quotas between years will lead to deviations that will cancel out over time. Fishing permits outside the ITQ system, for example special rules for the smallest boats, may not be fully accounted for when the quotas are set. In the past 5 years, catches of cod have exceeded quotas by an average of about 3.5% a year.**

**Evidence:**

There is a wide range of measures to ensure that the total catch is in accordance with the decided TAC.

- There is an obligation to land all catches, discarding is prohibited. Discards of cod is to some extent monitored and appears to be a minor problem.
- All landings must take place in designated ports, where the catch is weighed by authorized personnel. The approved weighs are entered directly into a database held by the Directorate, which is the primary source for catch statistics and monitoring of the quota status.
- There is a close monitoring of activities at sea
  - Direct inspections by the Coast guard and by on board inspectors from the Directorate
  - Detailed VMS monitoring which is closely followed by the Coast Guard, for control but also for security reasons.

Nevertheless, there is some deviation of final catches from the decided TAC. Some reasons for that are readily identified:

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

In the past 5 years, catches of cod have exceeded quotas by an average of about 3.5% a year (range -2% to +6%), except in the fishing year 2016/17, where the total catch was slightly below the TAC. The table 8 and Figure 42 show the recent historical record of adherence to the quotas, according to the MFRI advice.

Within the ITQ system, when transfers between years and species is taken into account (Figure 43), the catches are very close to the quotas[136]. However, the amounts set aside for the fisheries outside that system tends to be below the actual catches.

**Table 8.** Icelandic cod quotas and catches

| Fiskveiðiár *Fishing year* | Tillaga[1)] *Rec. TAC[1)]* | Aflamark *National TAC* | Afli Íslendinga *Catches Iceland* | Afli annarra þjóða *Catches others* | Afli alls *Total catch* |
|---|---|---|---|---|---|
| 2010/11 | 160 000 | 160 000 | 165 000 | 2000 | 167 000 |
| 2011/12 | 177 000 | 177 000 | 183 000 | 2000 | 185 000 |
| 2012/13 | 196 000 | 195 000 | 210 000 | 2000 | 215 000 |
| 2013/14 | 215 000 | 214 000 | 224 000 | 2000 | 226 000 |
| 2014/15 | 218 000 | 216 000 | 221 000 | 2000 | 223 000 |
| 2015/16 | 239 000 | 239 000 | 249 000 | 2000 | 251 000 |
| 2016/17 | 244 000 | 244 000 | 234 649 | 2995 | 237 644 |
| 2017/18 | 257 572 | 255 172 | 267 140 | 3077 | 270 217 |
| 2018/19 | 264 437 | 262 000 | | | |
| 2019/20 | 272 411 | | | | |

[1)] 20% aflaregla. *20% harvest control rule.*

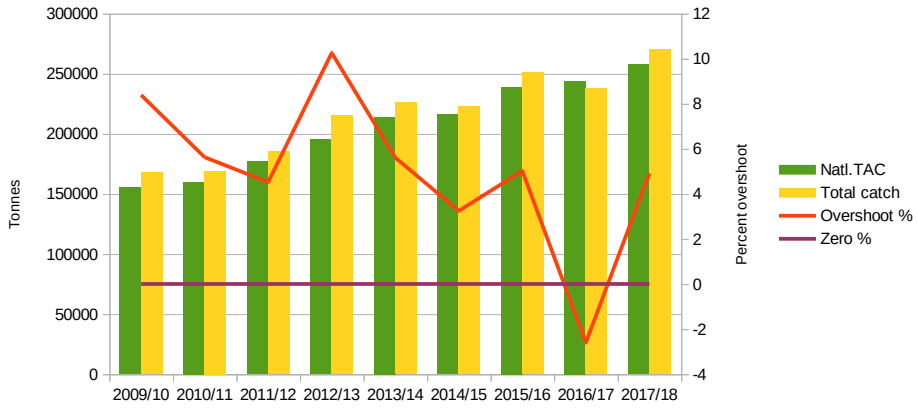



**Figure 42.** Comparing national TAC with total catch.

136 http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/

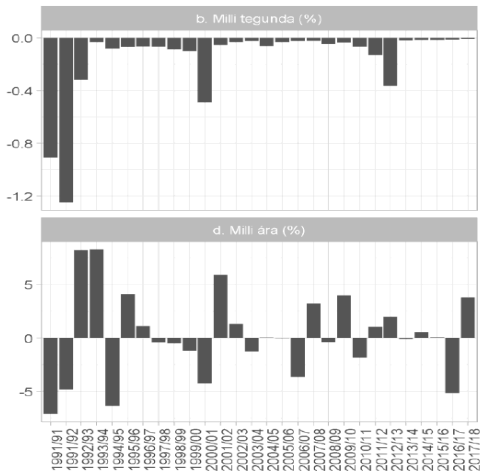



**Figure 43.** Transfers of cod quotas in percent. Upper: Transfer of quota between species (negative values are from cod into other species, transfer in the other direction is not permitted for cod). Lower: Transfer between years.

The Assessment Team has issued a formal Recommendation (relating to clause 1.5.8.) for the Client Group to consider so that the issue of TAC overshooting (due to flexibility measures in Iceland) may be addressed at the next management plan revision in 2021 and that the harvest control rule evaluated through simulation by addressing the implementation bias in the order of magnitude experienced in recent years.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 10.1.5.9. Clause 1.5.9.

The competent fisheries management authorities shall cooperate and actively participate in competent Regional Fisheries Management Organisation(s) (RFMOs) or arrangement(s), relevant to the stock under consideration and management agreements reached shall be implemented by fisheries authority and effectively and uniformly executed.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Iceland participates in other fisheries and non-fisheries organisations/arrangements in the North Atlantic region.**

**Evidence:**
Stock assessment and advice, including advice on TACs and reference points is provided by ICES. The management plan was evaluated and approved by ICES. The advice process in ICES involves all relevant nations. As cod is regarded as a domestic stock, there is no management agreements with other nations, except some minor fishing rights for the Faroes and Norway. The advice is taken over by local authorities. In Iceland, the Ministry is advised by the MFRI, based on the ICES advice.

The general legal basis that applies to all Icelandic fish stocks also apply to cod. The management measures cover setting of TAC, distributing the TAC on relevant parties in the ITQ system, control and enforcement to ensure that the actual removals correspond to the TAC, and protective measures.

In addition, Iceland participates in other fisheries and non-fisheries organisations/arrangements in the North Atlantic region such as:

- The North East Atlantic Fisheries Commission (NEAFC[137])
- The Northwest Atlantic Fisheries Organisation (NAFO[138])
- The International Council for the Exploration of the Sea (ICES[139])
- The North Atlantic Marine Mammal Commission (NAMMCO[140]).

Some of Iceland´s commercially important fish stocks, for example golden redfish, extend beyond its 200 nm EEZ and as a result are shared between countries/states; these shared stocks have necessitated the development of international cooperation. For Icelandic cod, this is not an issue.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

137 http://www.neafc.org/
138 http://www.nafo.int/
139 http://www.ices.dk/Pages/default.aspx
140 http://www.nammco.no/

### 10.1.5.10. Clause 1.5.10.

In the absence of specific information on the stock under consideration, generic evidence based on similar stocks may be used for fisheries with low risk to that stock under consideration. However, the greater the risk the more specific evidence is necessary to ascertain the sustainability of intensive fisheries[141].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>Stock abundance is estimated by a full analytic assessment. Accordingly, using generic evidence as a fall back is not necessary. | | | | |
| **Evidence:**<br>Stock abundance is estimated by a full analytic assessment[142]. Accordingly, using generic evidence as a fall back is not necessary. | | | | |
| **References:** | See footnote. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

141 FAO Guidelines (2009), para. 30.4.

142 http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

## 10.2. Section 2: Compliance and Monitoring

### 10.2.1. Clause 2.1. Implementation, Compliance, Monitoring, Surveillance and Control

#### 10.2.1.1. Clause 2.1.1.

An effective legal and administrative framework at the local, national or regional level, as appropriate, shall be established for the fishery and compliance shall be ensured through effective mechanisms for monitoring, surveillance, control and enforcement[143].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

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

**Evidence:**

The Icelandic Directorate of Fisheries is an independent administrative body responsible to the Fisheries Minister, responsible for the day to day implementation of the Act on Fisheries Management and related legislation, for day-to-day management of fisheries and for supervising the enforcement of fisheries management rules. More specifically, the Directorate of Fisheries works in accordance with the following Acts, the Directorate of Fisheries Act (no. 36/1992)[144], the Fisheries Management Act (no. 116/2006), the Act on Fishing in Iceland's Exclusive Economic Zone (no. 79/1997), the Act concerning the Treatment of Commercial Marine Fish Stocks (no. 57/1996) and the Act on a Special Fee for Illegal Marine Catch (no. 37/1992). Accordingly, it issues fishing permits to vessels and allocates catch quotas, imposes penalties for illegal catches, supervises the transfer of quotas and quota shares between fishing vessels, monitors vessels using the VMS system e-logbooks, controls the reporting of data on the landings of individual vessels and monitors the weighing of catches[145]. 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.

The Directorate has 61 staff (as of December 2018[146]) located at 6 offices throughout the country with its headquarters in Akureyri. It has 3 core divisions: Salmon and Trout Fishing, the Fisheries Management Division (Fisheries Inspectorate) and the Service and Information division, and two support divisions: Information Technology and Human Resources and Finance.

143 2005 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.

144 https://www.althingi.is/lagas/149a/1992036.html

145 http://www.fiskistofa.is/english/about-the-directorate/

146 http://www.fiskistofa.is/media/arsskyrslur/13_Fiskistofa-15.-april-2019_Starfsmenn.pdf

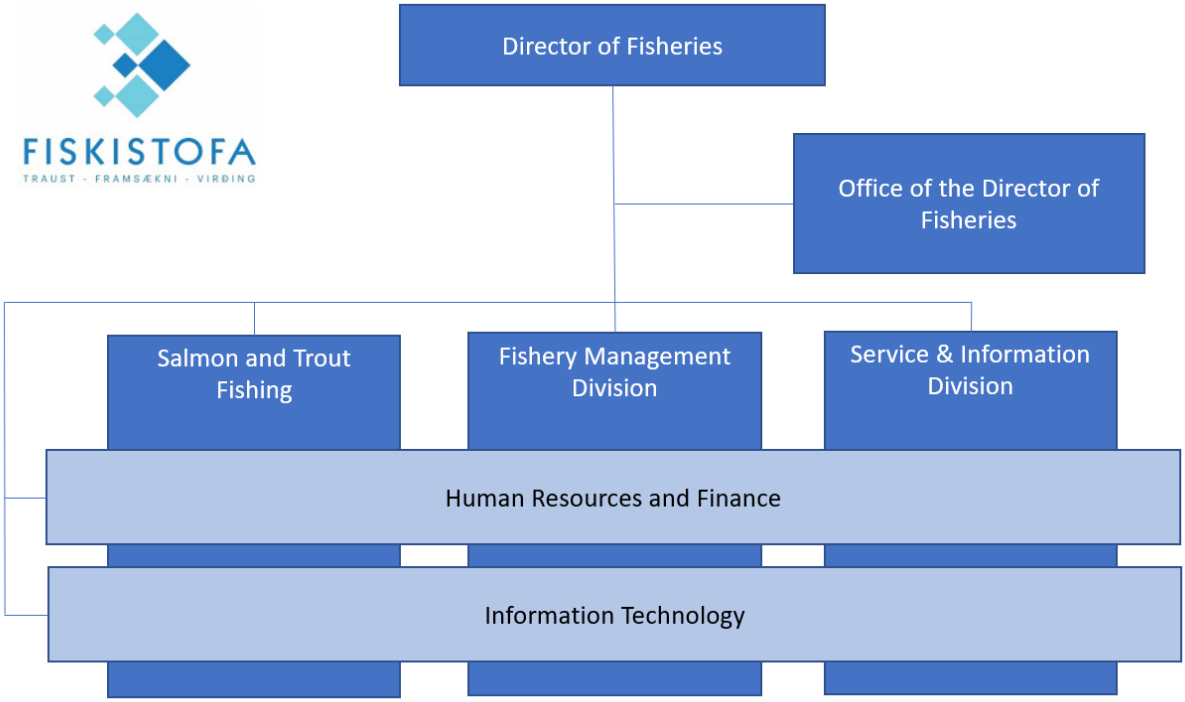



**Figure 44.** Directorate of Fisheries organisational chart and staff (Source: SAIG, modified from http://www.fiskistofa.is/umfiskistofu/skipurit/).

The primary legislative instrument relating to fisheries management in Iceland and the basis for the ITQ system is the Fisheries Management Act No.116/2006[147]. It supersedes the Fisheries Management Act 1990 and established allocation harvest rights and permit requirements for all participating commercial fishing vessels. These permit requirements represent the initial legal requirement without which a vessel may not obtain the quota necessary to fish for Icelandic quota stocks, such as cod. General fishing permits are of two types, a general fishing permit with a catch quota or a general fishing permit with a hook-and-line catch quota. A vessel may only hold one type of fishing permit each fishing year. Commercial fishing permits are cancelled if a fishing vessel has not been fishing commercially for 12 months (Article 4).

Commercial fishing permits may only be granted to fishing vessels holding certificates of seaworthiness and registered in the Registry of Vessels (Article 5). This Registry is administered by the Maritime Division of the Icelandic Transport Authority (ICETRA)[148].

The Fisheries Management Act sets out penalties for the violation of its provisions, or rules adopted by virtue of it, which are provided in detail in the Act Concerning the Treatment of Commercial Marine Fish Stocks (Act No. 57 1996[149]). Provisions of the Act on a Special Fee for Illegal Marine Catch[150] are also applied as appropriate. Penalties range from the issue of reprimands by the Directorate of Fisheries and the

[147] https://www.ecolex.org/details/legislation/fisheries-management-act-1990-lex-faoc003455/
[148] https://www.icetra.is/maritime/ships-and-cargoes/
[149] https://www.althingi.is/lagas/149a/1996057.html
[150] https://www.althingi.is/lagas/149a/1992037.html

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).

The Act governing fishing activities within the Icelandic EEZ (Act No. 79/1997)[151] specifies the Icelandic EEZ and prohibits foreign vessels from fishing within Iceland's EEZ (unless by prior agreement). It sets out the area's vessels are permitted to fish within the EEZ according to fishing vessel size and power index category (Article 5). It grants powers to the Minister to limit fishing to prevent localised overfishing of a specific stock or excessive by-catch of non-target species (Article 7) and requires the Minister to take measures to prevent harmful fishing practices and to preserve sensitive areas (Article 9). It requires the MFRI to be notified of harmful fishing, particularly where the proportion of undersized fish in the catch exceeds advised reference levels, grants powers to the MFRI to declare temporary closures and sets out how these should be implemented (Articles 10 and 11). It grants powers to the Minister to set rules on the minimum size of marine animals which can be caught (Article 14) and sets out penalties for violation of the provisions of the Act (Articles 15-17) which include the power to confiscate fishing gear and catch in the case of major or repeated violations. The Act stipulates that fines assessed in accordance with the Act as well as the value of any confiscated catch and fishing gear, shall accrue to the Icelandic Coast Guard Fund.

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.

Within two hours of landing catches are officially separated, weighed and recorded by accredited weighing stations and reported against the appropriate quota allocation following provisions outlined in the Act No 57, 1996 concerning the Treatment of Commercial Stocks, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources[152]. The Fishery Management Act also makes provisions for processing at sea, weighing by auction houses and the transfer of quotas to cover landings.

As required by Article 10 of Regulation No. 745/2016, each landing generates a weighing receipt[153,154] recording:

- Vessel name, registration number and district number;
- Landing port and date of landing;
- Name of seller, buyer and recipient of the catch;
- Official weight by species of catch;
- Proportion of undersize fish in catch;
- Number, type and weight of tubs/boxes/barrels;
- Fishing gear used;
- Total number of pallets of platforms;
- Registration number and tare of transport vehicle;
- Whether catch is to be re-weighed;

[151] *extwprlegs1.fao.org/docs/texts/ice89476.doc*
[152] https://www.stjornartidindi.is/Advert.aspx?RecordID=884be309-64a5-4367-9e4d-f5e7216b6f40
[153] https://www.fmis.is/blank
[154] http://www.unuftp.is/static/fellows/document/pan09prf.pdf

- Whether any of the catch is un-gutted and needs to be either weighed after gutting or converted to a gutted weight using coefficients provided by Directorate.

The scale operator has 10 minutes to enter the info within the system before it locks. There is a formal process involving the port authorities and the Directorate's service centre to make corrections. The system flags where weighing/re-weighing occurs and is checked by the Directorate's service centre once or twice a day to determine whether flagged items are acceptable. If not, the service centre refers them to inspectors for further checks (Fisheries Directorate, pers. com. site visit November 2018).

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. These two sets of information are then compared, and the appropriate reduction is made to the vessel quota. Any transfer under the ITQ system for each vessel is also monitored to ensure that any additional quota requirements are rented from other vessels within a 3-day period required by law. The reporting system is not real time but is very near real time (circa. 24 hours).

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. These private companies and fish markets are required to send weighing information to the relevant port authority who then submit it to the Fisheries Directorate's catch registration system. There are also legal requirements covering the licensing of the re-weighing of catch or weighing after gutting on land which are also monitored.

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)[155] 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. *The Assessment Team will continue to review the actions implemented to improve some of the shortcoming identified in the Icelandic NAO report, in upcoming surveillances.*

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

During the site visit on the 27th November 2018, the assessors visited a fish market and were shown the landed fish, weighing scales and the information recorded on the system which goes to the Port Authority who then submit it to the Fisheries Directorate's catch registration system. Both the weighing scales and their operators are licensed and audited by the Directorate. The system is developed to standardise weights and tares for ice and tubs (a standard tub is used throughout Iceland for fresh fish such as cod and has a capacity of 280-300 kg). The tubs are labelled for the purposes of traceability. The Audit Team were also shown the equipment used to measure ice.

The ITQ system has rules and flexibilities to allow for corrective management measures and adjustments to be incorporated. For example, a vessel can transfer some of its quota between fishing years, but its quota is lost if it catches less than 50% of its total quota, measured in "cod equivalents", in two subsequent years. There is also a requirement that within the year, the net transfer of quota from any vessel must not exceed 50% (Article 15, Act No. 116/2006).

A separate hook and line quota system (Aflamark - krókaaflamark) is available for small vessels less than 15 gross tonnage (GT). These are only allowed to fish with handlines or longlines. These boats get quotas for all the major demersal species and can freely transfer the quota within the hook and line system. However, to prevent consolidation of fishing rights these quotas cannot be transferred to the catch quota management system. The hook and line quota is limited to 700 vessels[156].

Each fishing year the Minister shall have available harvest rights amounting to up to 12,000 tonnes of ungutted demersal species (Article 10, Act No. 116/2006), which he may use:

1. to offset major disturbances which are anticipated because of sizeable fluctuations in the catch quotas of individual species;
2. for regional support, in consultation with the Regional Development Institute, through allocations;
    a) to smaller communities which are facing difficulties due to downturns in fisheries and which are dependent upon demersal fishing or processing;
    b) to communities which have suffered unexpected cutbacks in the total catch quotas of fishing vessels operating from and landing their catch in the communities in question, which has had a substantial impact on the employment situation in these communities.

Vessels may fish in excess of their catch quota for individual demersal species, with the result that their catch quota for other demersal species will be reduced in proportion to the relative value of each species. This authorisation is limited to 5% of the total value of the demersal quota held by the vessel, but no more than 1.5%[157] of the quota held for each individual demersal species. However, this authorisation does not apply to fishing in excess of the allocated catch quota of cod.

Vessels may also fish up to 5% in excess of their catch quota for each demersal species with the result that the excess catch will be deducted from their allocated catch quota for the following fishing year.

Vessels may transfer up to 15%[158] of catch quotas for each demersal species from one year to the next.

[156] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Krokaaflamarksbatar
[157] Act No. 116/2006 as amended by Act No. 70/2011 (http://vefbirting.oddi.is/raduneyti/fiskveidar2018/11/index.html#zoom=z)
[158] Act No. 116/2006 as amended by Act No. 22/2010

Vessels may also decide not to include part of the vessels catch in its catch quota. This is limited to no more than 0.5% of the vessel's pelagic catch and 5% of other marine catches per fishing year. Furthermore, this catch, known as 'VS catch', must be kept separate from the rest of the vessel's catch and weighed and recorded separately; it must be sold at an approved auction and the bulk of the proceedings of the sale must go to the Fisheries Commission Project Fund or 'VS Fund' (established by Act No. 37/1992), 20% going to the vessel (Article 11, Act No. 116/2006)[159]. The maximum of 20% return on VS catches means that there are limited incentives to land it; however, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, preventing discards, improving the treatment of the fishery resource and promoting responsible fishing practices.

At sea surveillance is primarily the remit of the Icelandic Coast Guard. 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. The figure below shows the number of boardings undertaken by the Coast Guard since 2005. In 2017, the Coast Guard conducted 155 vessel boardings, a decrease on the corresponding number of 216 in 2016. The Coast Guard also undertake aerial surveillance, amounting to 166 hours in 2017 which is lower than 2015-2016 when over 200 hours were flown (Figure 45).

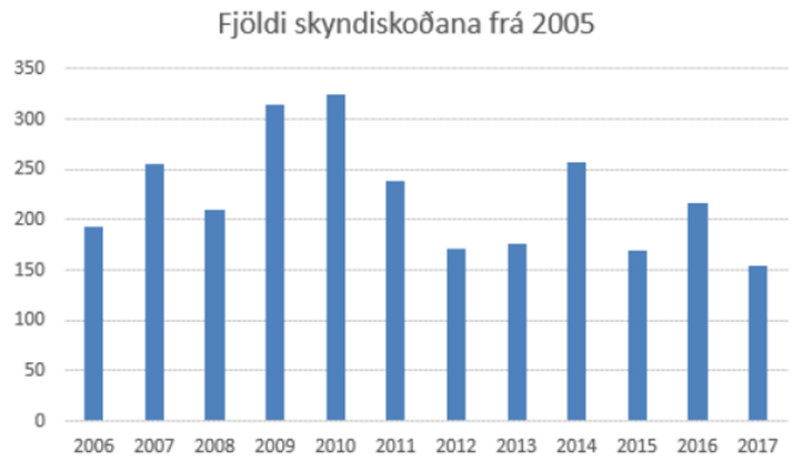



**Figure 45.** Number of inspections by the Coast Guard from 2005 (Source: Coast Guard presentation provided to the assessment team, November 2018).

[159] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Sveigjanleiki_i_aflamarkskerfinu

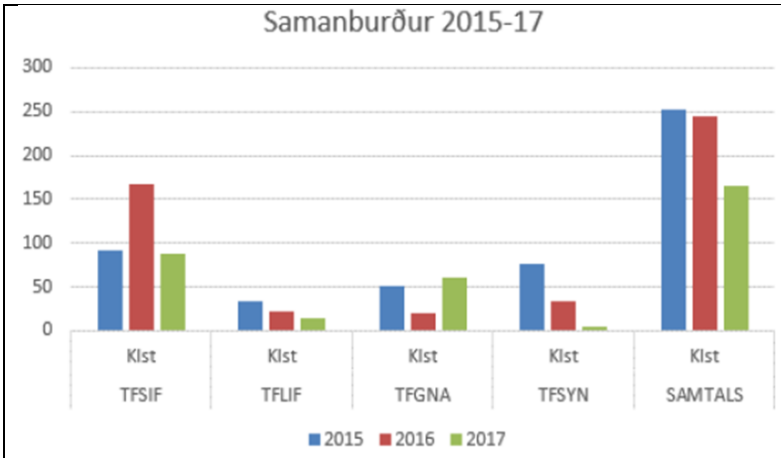



**Figure 46.** Air surveillance 2015-2017. The final column (Samtals) shows total hours air surveillance flown, whilst the other columns show hours by individual aircraft (Source: Coast Guard presentation provided to the assessment team, November 2018).

Days spent by Fisheries Directorate inspectors at sea inspecting vessels as a proportion of total fishing effort is shown in the table below.

**Table 9.** Directorate inspector days on fishing vessels in 2017-2018 (Source: Directorate of Fisheries, November 2018 site visit).

| Fishery type | Bottom Trawl | Longline | Gillnet (include lumpfish fishery and cod fishery) |
|---|---|---|---|
| 2017/2018 days | 570 | 202 | 152 |
| 2017/2018 coverage % | 1.93% | 0.64% | 3.64% |

Vessel logbooks are inspected during random unannounced boardings both at sea (by the coastguard) or at the quayside (by Fisheries Directorate inspectors) which may include a comparison of catch and logbook entries. Between 2014 and 2017 there have been 97 infringements recorded by the Coast Guard. The main reasons for the generation of remarks during Coast Guard inspections have largely remained consistent in recent years or declined. The most significant numbers of infringements related to manning lists (lögskráningar) and seaworthiness (Haffæri). Only one infringement relating to fisheries (Veiðar) was recorded in 2017. Foreign vessels are also inspected – both in the Icelandic EEZ and further afield as part of Iceland's contribution to monitoring and surveillance as a member of NEAFC. In 2017, 18 foreign vessels were inspected which, in relation to fishing activities in the Icelandic EEZ, led to remarks to 2 Norwegian capelin fishing vessels due to gear infringements and to a Faroe Islands handline/jigger vessel for logbook infringement.

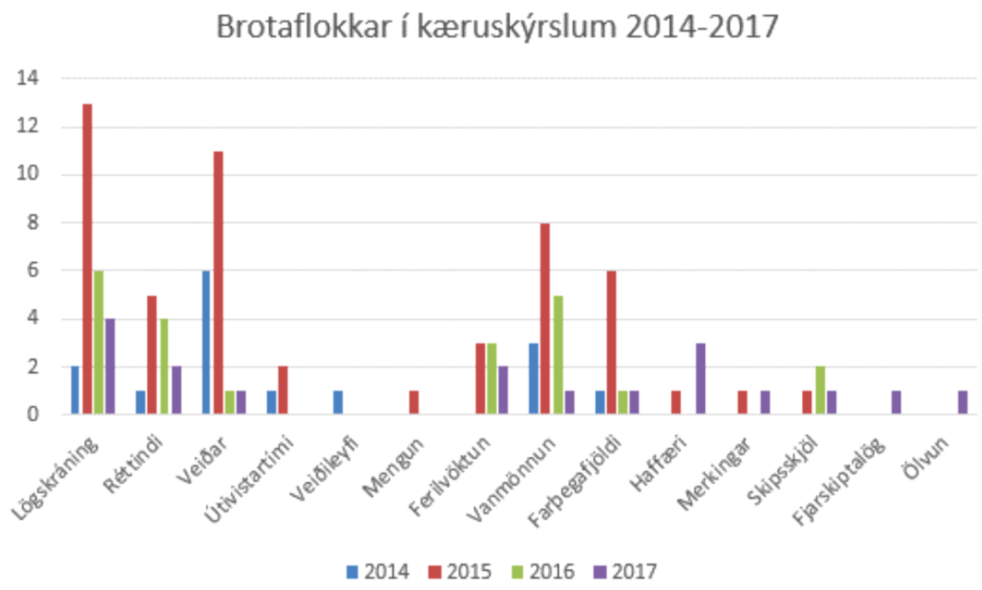



**Figure 47.** Reasons for the generation of remarks, by no. of remarks generated, during Coast Guard inspections in 2014-2017; Lögskráningar – Manning list, Réttindi – License, Veiðar – Fishing , Útivistartími – Time limits , Veiðileyfi – Fishing permit, Mengun – Pollution, Ferilvöktun – VMS, Vanmönnun – Manning, Farþegafjöldi – Passengers, Haffæri – Sea worthiness, Merkingar – Marking, Skipsskjöl – Ship's papers, Fjarskiptalög – telecommunications, Ölvun - intoxication (Source: presentation provided to the assessment team by the Coast Guard).

In their annual report, the Fisheries Directorate publish a comprehensive summary of suspected offenses recorded during maritime surveillance and the enforcement action subsequently taken (Tables below). A comparison of some of the enforcement action taken in recent years is shown in figure 47. By far the main suspected offenses detected relate to logbooks, specifically not submitting them in the required timeframes (399 in 2018), and fishing in excess of or without quota (1162 in 2018). Much of the former arises from late submission of logbooks each month by small vessels using paper logbooks, with each instance registered as an offence. Similarly, the quota infringement relates to each incidence detected of vessels that have taken longer than the 3 days required by law to balance their quota where they have landed fish in excess of their quota (where proceeding to fish without quota is a separate offence) (Pers. com. Fiskistofa).

Where a suspected violation of the fisheries management legislation has occurred, the case is referred to the Directorate's Legal Department for enforcement action. In 2017, 220 cases where referred, 131 in 2016. Breaches of the law are handled in several ways. Some cases are dropped and no further action taken, otherwise action taken ranges from the issue of reprimands, application of administrative fines, suspension or revocation of fishing permits and weighing licenses or, in a small number of cases, sent to the police for criminal action to be taken. There is also a specific chapter in the Annual Report summarising the imposition and collection of fees for illegal catches of fish in that year.

**Table 10.** Overview of suspected offenses recorded in Icelandic fisheries (Source: Fiskistofa Annual Reports 2018[160], 2017[161] and 2016[162]).

| Offenses recorded by Fiskistofa | 2018 | 2017 | 2016 |
|---|---|---|---|
| Violation of landing rules (broken down into:) | 31 | 52 | 60 |
| • *Not landing fish at official landing location* | 6 | *5* | 4 |
| • *Weighing container* | 19 | *10* | 13 |
| • *Misreporting (Landing full size fish as part of catches of juveniles)* | *6* | *9* | 22 |
| • *Incorrect specification of species* | *0* | *11* | 4 |
| • *Other* | *No data* | *17* | 17 |
| Discarding catch | 12 | 8 | 4 |
| Violation of fishing license rules | *No data* | 36 | 15 |
| Violation of lumpfish fishery rules | 39 | 19 | 11 |
| Violation of coastal fishery rules | 4 | 10 | 46 |
| Logbooks (broken down into:) | 457 | 719 | 689 |
| • *Not submitting logbooks on time* | *399* | *674* | 657 |
| • *Other* | *58* | *45* | 31 |
| Fishing in excess of or without quota | 1162 | 1201 | 1,060 |
| Violation of law on salmon and trout fishing | 3 | 1 | 2 |
| Other violations | 51 | 45 | 14 |

**Table 11.** Enforcement action taken (Source: Fiskistofa Annual Reports2018[163], 2017[161] and 2016[162]).

| Offences | 2018 | 2017 | 2016 |
|---|---|---|---|
| Violation of fishing rules | 49 | 97 | 31 |
| Violation of weighing and landing rules | 14 | 71 | 50 |
| Violation of logbook rules | 27 | 45 | 31 |
| Violation of processing catch rules | 2 | 0 | 2 |
| Case sent to Police | 4 | 1 | 4 |
| Reprimands issued (broken down below) | 92 | 96 | 79 |
| Due to violation of fishing rules | 14 | 50 | 14 |
| Due to violations of weighing and landing rules | 8 | 12 | 31 |
| Due to violation of logbook rules | 3 | 33 | 26 |
| Due to other violations | 0 | 3 | 8 |
| Suspension of fishing permit | 25 | 31 | 14 |
| Suspension of weighing license | 6 | 4 | 1 |
| Guidance letter sent | 7 | 6 | 6 |
| No action taken | 59 | 33 | 20 |
| Case sent to another authority | 5 | 1 | 1 |

[160] http://www.fiskistofa.is/media/arsskyrslur/8_Fiskistofa-15.-april-2019_Medferd-mala.pdf
[161] Fiskistofa 2017 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/medferd_mala_og_urskurdir.pdf
[162] Fiskistofa 2016 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/kafli8_2016.pdf
[163] http://www.fiskistofa.is/media/arsskyrslur/8_Fiskistofa-15.-april-2019_Medferd-mala.pdf

| | | | |
|---|---|---|---|
| Procedure still in progress | 53 | 46 | 8 |
| Case returned to the inspectors | No data | 2 | No data |
| **Fees** | | | |
| Reminder letter sent for unpaid fishing fees 2017 | 234 | 231 | 145 |
| Resulting in suspension of fishing permits | 78 | 89 | 85 |
| Fees imposed for illegal catches | 1150 | 1201 | 130 |
| Resulting in suspension of fishing permits | 77 | 25 | 65 |

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

#### 1.1.1.1. Clause 2.1.2.

Laws and regulations concerning conservation and management measures shall be publicly available and effectively disseminated.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

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

**Evidence:**
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)[164].

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.[165]

All scientific advice is available online[166]. Harvest control rules are scrutinised on request by an independent scientific body (ICES) with reports being published online[167] .

Up-to-date maps of fisheries closures are available on-line on the Fisheries Directorate website[168]. Temporary/sudden closures (general 2-3 weeks triggered by high juvenile abundance on fishing grounds) are announced by the Coastguard on VHF radio on a specified wavelength and on the radio before the news and weather (Fisheries Directorate pers. com. site visit November 2018). They are also published on the MFRI website.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[164] https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2019/09/13/Stjorn-fiskveida-2019-2020-Log-og-reglugerdir/
[165] http://www.fiskistofa.is/
[166] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf
[167] https://www.stjornarradid.is/media/atvinnuvegaraduneyti-media/media/frettir/Icelandic_cod_management_20plan.pdf
[168] http://www.fiskistofa.is/fiskveidistjorn/veidibann/reglugerdarlokanir/

### 1.1.2. Clause 2.2. Concordance between actual Catch and allowable Catch

#### 1.1.2.1. Clause 2.2.1.

Concordance between the Total Allowable Catch (TAC) and actual total catch from stock under consideration shall be ensured through control, enforcement, documentation, correction and verification.[169]

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

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

**Evidence:**

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

Logbooks are compulsory as required by Regulation No.746/2016[170]. These must be electronic (e-logs) except for smaller vessels which are permitted to still use paper logbooks. Catch data must be entered on the e-log using a Fisheries Directorate-approved programme and all changes to entries must be visible and traceable. It is prohibited to start a fishing trip without a logbook on board. Vessel masters are required to record the following information in their logbooks:

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

The e-logs in use are developed and serviced by TrackWell, an Icelandic electronic systems service company; which also provide satellite Vessel Monitoring Systems (VMS) and electronic reporting systems. These

[169] For long-lived species, this can include flexibility provisions such as legal allowance and adjustment for limited transfer of vessel quotas between adjacent management periods (years) as well as provisions providing incentives against discards.

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

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

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

Landings must be weighed within 2 hours of landing by an official weigher using calibrated scales. Following allowances for ice the official weight is forwarded to the Directorate where it is compared with the relevant e-logbook entry before an appropriate deduction is made to that vessels remaining quota. The officially weighed catches are the official catch of record with e-log information being used as a secondary source to ensure accuracy. If a vessel does not have sufficient quota to cover it has a number of options available to it such as renting in additional quota or transferring quota between species; however, the landings must be fully covered within 3 working days as required by law (Act No. 57/1996). Referring back to Clause 2.1.1 we note that the 1162 quota infringement (across all fisheries) recorded by the Directorate in 2018 relate to incidences where vessels that have taken longer than the 3 days required by law to balance their quota where they have landed fish in excess of their quota (where proceeding to fish without quota is a separate offence) (Pers. com. Fiskistofa).

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)[152].

Fishing seasons in Iceland run from 1st September to 31st August the following year. Following the setting of the overall TAC each vessel is allocated a certain share of the overall TAC based on the number of shares in the Icelandic system of ITQs it possesses. 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.

Since the introduction of the management plan in 2009/2010, TACs in all years have been set in line with scientific recommendations (see table 7 of 2019 ICES Advice[171]). In the past 5 years, since the original RFM assessment, catches have exceeded quotas by about 3.5% a year, except in the fishing year 2016/17, where the total catch was slightly below the TAC. The reasons for the (legal) overages (landing of juveniles, discard ban and flexibility measures) have been discussed in clause 1.5.8.

**2019/20 Advice and TAC**

[171] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf

| | |
|---|---|
| In June 2019 MFRI and ICES advised that catches of cod in the 2019/2020 fishing season, based on the 2019 stock assessment and in accordance with the accepted HCR and management plan, should be no more than 272 411 tonnes. The TAC has been set in line with this advice, as set out in the Regulation on fishing for the year 2019/2020 (No. 703/2019)[172]. | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[172] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/21565

### 1.1.2.2. Clause 2.2.2.

Monitoring, surveillance and information feed-back shall be used to collate information on actual catch.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Monitoring, surveillance and information feedback is used to collate information on actual catch. The registered weight for each landing is sent to the Fisheries Directorate, where it is compared to the e-logbook data for the fishing trip, before the appropriate amount is subtracted from the vessels quota. The official weights used are the standardised registered landing weight with logbook records being used as a supplementary source to cross-check landings.**

**Evidence:**
As noted in clause 2.2.1, monitoring and surveillance information is used to collate information on actual catch. The system provides information on catch through recording catch information in logbooks, weighing of catch at landing and also records of the subsequent sale of the catch, which are compared to verify actual catches made. This is checked by surveillance at sea by the Coast Guard and inspectors of the Fisheries Directorate (for example, correct recording of catch in logbooks corresponding to composition of hauls) and also on land by inspectors (checking logbooks and correct weighing of landings). Information from logbooks and landings is submitted to the Fisheries Directorate catch registration system (GAFL). See evidence presented in clause 2.2.1.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.2.3. Clause 2.2.3.

Corrective management measures and/or appropriate adjustments in management decisions shall be implemented when the need is indicated by the relevant information.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Corrective management measures and/or appropriate adjustments in management decisions are implemented when the need is indicated by the relevant information.**

**Evidence:**

The Icelandic cod stock is currently not overfished or experiencing overfishing. Between 2016 and 2018 ICES assessed that fishing pressure on the Icelandic stock in is below HRMSY, Fpa, and Flim, and spawning stock size is well above MSY Btrigger, Bpa, and Blim.[173] Current SSB in 2019 is estimated to be above 600000 tonnes, against a Blim value of 125000 tonnes, indicating that the Fishery Management Plan and Harvest Control Rule therein are effective.

A December 2018 report from the Icelandic National Audit Office (NAO)[174] 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 implemented some corrective measures by placing 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. It is also worth noting that when the Directorate of Fisheries inspects weighing license holder and a significant deviation in ice ratio is found, the agency is authorized to monitor all reweighting of the party concerned at his expense for up to 6 weeks.

Furthermore, the Directorate of Fisheries has increasingly used diagnostic software for so-called electronic surveillance in 2018[175]. This effort utilizes data from databases to analyse specific risk factors and thus try to direct monitoring where most needed. For example, the Agency has conducted risk assessments for certain regulatory aspects. Progress was made in the development of electronic surveillance during the year to regularly inspect, among other things, the catch composition in ships on the same fishing grounds with respect to catches and discards, and in regard to icing on board of fishing vessels.

The Assessment Team will continue to review the actions implemented to improve some of the shortcoming identified in the NAO report, in upcoming surveillances.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

[173] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf
[174] https://rikisendurskodun.is/wp-content/uploads/2019/01/Eftirlit-Fiskistofu-Stjornsysluuttekt.pdf
[175] http://www.fiskistofa.is/media/arsskyrslur/5_Fiskistofa-15.-april-2019_Eftirlit.pdf

### 1.1.2.4. Clause 2.2.4.

Participating companies shall:

2.2.4.1. Ensure that they have been issued with all required permits;
2.2.4.2. Operate in compliance with the relevant rules and regulations;
2.2.4.3. Limit the catches of their vessels in accordance with their catch quota.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Fishing companies have been issued with all required permits; operate in compliance with the relevant rules and regulations; and limit the catches of their vessels in accordance with their catch quota. These are legal requirements which are monitored by the Fisheries Directorate, Coastguard and Port Authorities and enforcement action is taken.**

**Evidence:**
Fishing companies have been issued with all required permits; operate in compliance with the relevant rules and regulations; and limit the catches of their vessels in accordance with their catch quota. These are all legal requirements, for example vessels must have a license to fish and cannot leave port if they do not have sufficient quota. If they fish in excess of their quota they must arrange any transfers required within strict time limits or they cannot resume fishing.

Compliance with these rules is monitored by the Fisheries Directorate and Coast Guard. Evidence presented by the Fisheries Directorate and the Icelandic Coast Guard shows that vessel operators and companies are generally compliant with the relevant legislation and ensure catches by their vessels are in accordance with their catch quota. Where violations are confirmed, enforcement action is taken. Most cases are on the lower end of the scale of seriousness and addressed by administrative penalties, in particular by reprimands. Relatively few cases involve the more serious penalties such as suspension of fishing permits or weighing licenses or prosecution by the police.

See evidence presented in clause 2.1.1.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3. Clause 2.3. Monitoring and Control

#### 1.1.3.1. Clause 2.3.1. Vessel registration and catch quotas

##### 1.1.3.1.1. Clause 2.3.1.1.

Allocated catch quotas by species are assigned in such a way that the combined quotas conform with the currently effective decision on TAC.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

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

**Evidence:**

Quotas conform to the overall decision on TAC, through the individual vessel quota share and other allocations. The headline TAC for a species is determined first and all subsequent allocations are in effect subdivisions of that figure. As a result, the allocated catch quotas for a species (when quotas are initially allocated) are assigned in such a way that the combined quotas for that species conform to the currently effective decision on TAC.

Catches by vessel are monitored and recorded in near real-time in a central database maintained by the Fisheries Directorate[176]. The official weight of the catch is subtracted from that vessels individual quota share for a particular species.

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

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

| | |
|---|---|
| **References:** | See footnote. |
| **Non-Conformance Number (if relevant)** | **NA** |

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

#### 1.1.3.1.2. Clause 2.3.1.2.

Commercial fishing shall be solely conducted with registered vessels authorised to participate in the fishery by the competent authorities.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Commercial vessels participating in the fishery require a permit issued by the Fisheries Directorate. Permits are only granted to fishing vessels holding certificates of seaworthiness and registered in the Registry of Vessels.**

**Evidence:**
Commercial vessels participating in the fishery require a permit issued by the Fisheries Directorate. This is a requirement of the Fisheries Management Act No.116/2006. These permits represent the initial legal requirement without which a vessel may not obtain the quota necessary to fish for Icelandic quota stocks, such as cod. General fishing permits are of two types, a general fishing permit with a catch quota or a general fishing permit with a hook-and-line catch quota. A vessel may only hold one type of fishing permit each fishing year. Commercial fishing permits are cancelled if a fishing vessel has not been fishing commercially for 12 months (Article 4 of Act No. 116/2006). Foreign vessels are prohibited from fishing in Icelandic waters unless a right of access has been granted (e.g. Norway, Faroe Islands) (Act on fishing in Iceland's EEZ, No. 79/1997). In 2018 the general fishing permits issued to fishermen totalled 1,177, somehow less than the 1,244 issued in 2016/2017. In 2018 the number of coastal fishing licenses decreased to 557 from 607 in 2017. Full details have been reported in the Fiskistofa Ársskýrsla 2018 report[177].

Commercial fishing permits may only be granted to fishing vessels holding certificates of seaworthiness and registered in the Registry of Vessels (Article 5 of Act No. 116/2006). This Registry is administered by the Maritime Division of the Icelandic Transport Authority (ICETRA)[178].

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[177] http://www.fiskistofa.is/media/arsskyrslur/3_Fiskistofa-15.-april-2019_Veidileyfi-og-aflaheimildir.pdf
[178] https://www.icetra.is/maritime/ships-and-cargoes/

### 1.1.3.1.3. Clause 2.3.1.3.

The catch quota of each vessel or vessel group for each fish species and fishing year shall be recorded in the official central data base in a transparent manner.

| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
|---|---|---|---|---|
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The catch quota of each vessel for each fish species and fishing year is available on the Fisheries Directorate website. The Fisheries Directorate maintain a catch registration system (GAFL database) which is updated with information on registered catches 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.**

**Evidence:**

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:

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

For illustrative purposes, the table below shows the first 20 lines of the publicly available data on individual vessels' quota allocations of cod in the 2018/2019 fishing season. 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.

**Table 12.** First 20 lines of table showing the Icelandic cod fleet TAC allocation, transfer, balances and catches for the 2018/2019 fishing season (Source:[179]).

| Reg. no. | Vessel | Class | Alloc. quota | Compen-sations | Trfr. prev. year | Trfr. b/t vessels | Allowed catch | Catch | Balance | Overfished |
|---|---|---|---|---|---|---|---|---|---|---|

[179] http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 78 | Ísborg ÍS 250 | A | 0 | 20,195 | 0 | -20,195 | 0 | 0 | 0 | 0 |
| 89 | Grímsnes GK 555 | A | 55,068 | 0 | 0 | 538,189 | 593,257 | 593,257 | 0 | 0 |
| 173 | Sigurður Ólafsson SF 44 | A | 611,284 | 0 | -1,895 | 9,207 | 618,596 | 649,140 | -30,544 | 0 |
| 177 | Fönix ST 177 | A | 7,701 | 5,896 | 1,125 | -9,394 | 5,328 | 2,652 | 2,676 | 0 |
| 182 | Vestri BA 63 | A | 508,208 | -41,834 | -19,633 | -5,339 | 441,402 | 441,672 | -270 | 0 |
| 233 | Erling KE 140 | A | 1,229,307 | 3,386 | 126,523 | 165,232 | 1,524,448 | 1,340,052 | 184,396 | 0 |
| 253 | Hamar SH 224 | A | 626,245 | 0 | -8,918 | -6,667 | 610,660 | 628,135 | -17,475 | 0 |
| 264 | Hörður Björnsson ÞH 260 | A | 500,363 | 700,727 | -11,594 | 585,108 | 1,774,604 | 1,777,657 | -3,053 | 0 |
| 363 | Maron GK 522 | A | 11,451 | 0 | -558 | 703,323 | 714,216 | 713,215 | 1,001 | 0 |
| 530 | Hafrún HU 12 | A | 19,100 | 70,691 | -781 | 28,651 | 117,661 | 117,661 | 0 | 0 |
| 741 | Grímsey ST 2 | A | 68,662 | 20,412 | 0 | 25,530 | 114,604 | 104,366 | 10,238 | 0 |
| 926 | Þorsteinn ÞH 115 | A | 190,056 | 32,055 | 26,535 | 0 | 248,646 | 243,749 | 4,897 | 0 |
| 968 | Sleipnir VE 83 | 0 | 493,388 | 0 | 502 | -493,890 | 0 | 0 | 0 | 0 |
| 972 | Kristín GK 457 | A | 2,176,693 | 0 | -39,681 | -49,810 | 2,087,202 | 2,121,465 | -34,263 | 0 |
| 975 | Sighvatur GK 357 | 0 | 0 | 0 | 0 | 51,380 | 51,380 | 51,380 | 0 | 0 |
| 1006 | Krummi GK 10 | 0 | 0 | 3,386 | 0 | -3,386 | 0 | 0 | 0 | 0 |
| 1019 | Sigurborg SH 112 | A | 239,073 | 13,005 | 1,082 | 507,454 | 760,614 | 760,614 | 0 | 0 |
| 1028 | Saxhamar SH 50 | A | 1,054,105 | 343,591 | -5,845 | 51,077 | 1,442,928 | 1,461,384 | -18,456 | 0 |
| 1030 | Páll Jónsson GK 357 | A | 2,138,539 | 0 | -79,313 | 40,570 | 2,099,796 | 2,102,058 | -2,262 | 0 |
| 1043 | Jóhanna ÁR 206 | 0 | 0 | 36,422 | 0 | 54,353 | 90,775 | 90,775 | 0 | 0 |

| | |
|---|---|
| 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[180]. | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[180] http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en

### 1.1.3.1.4. Clause 2.3.1.4.

Information on the size and composition of the fleet of fishing vessels shall be available, documented and include the following provisions:

1) An officially maintained fishing vessel registry;
2) Participation in the fishery must be subject to licence;
3) Only vessels on the fishing vessel registry shall be authorised to participate in the fishery;[181]
4) For the stock under consideration, the allowed catch by species for each vessel or vessel group shall be specified.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Information on the size and composition of the fleet of fishing vessels is available and documented and includes an official fishing vessel registry maintained by the Icelandic Transport Authority (ICETRA). Participation in the commercial fisheries in Icelandic waters requires a fishing permit granted by the Fisheries Directorate and only vessels on the fishing vessel registry can be granted a permit. The allowed catch of cod for each vessel or vessel group is specified on the Fisheries Directorate website.**

**Evidence:**

In 2018 the general fishing permits issued to fishermen totalled 1,177, somehow less than the 1,244 issued in 2016/2017. In 2018 the number of coastal fishing licenses decreased to 557 from 607 in 2017. Full details on the fishing permits issued have been reported in the Fiskistofa Ársskýrsla 2018 report[182].

As noted in clause 2.3.1.2 vessels participating in Icelandic fisheries require a fishery permit and must be registered on the ICETRA. Foreign vessels are prohibited unless agreement has been reached to allow access. See clause 2.3.1.2 and 2.3.1.3 for further information.

Current quota share and TAC allocations by species, including cod, as well as running catch totals and remaining quota for the season for each vessel are freely available on the Directorates website. The consistent is considered to be very transparent[183].

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[181] Foreign registered vessels may be allowed to fish in Icelandic waters by international agreement; such vessels require specific permit from the Icelandic authorities and their catches are strictly monitored.
[182] http://www.fiskistofa.is/media/arsskyrslur/3_Fiskistofa-15.-april-2019_Veidileyfi-og-aflaheimildir.pdf
[183] http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en

### 1.1.3.2. Clause 2.3.2. Fishing vessel monitoring and control systems

#### 1.1.3.2.1. Clause 2.3.2.1.

A program for the monitoring and control of fishing vessel activities shall be operated and enforcement shall be in place to prevent fishing by unauthorised vessels.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**The Icelandic Coast Guard, working closely with the Fisheries Directorate, administers an integrated monitoring, control and surveillance system which covers the activities of Icelandic and foreign fishing vessels.**

**Evidence:**

The Icelandic Coast Guard administers the VMS for all Icelandic vessels and for all foreign vessels (including fishing vessels) that enter Icelandic waters as part of an integrated monitoring, control and surveillance system. The purposes of the system are numerous, and it incorporates several related services including maritime traffic control, marine search and rescue, fisheries enforcement, coastal radio and border control in a single Operations Centre[184]. The importance of the fisheries sector to the Icelandic economy and the need for greater efficiency, due to the relatively small size of the institutions involved, has led to high levels of collaboration and integration resulting in creative and dedicated approaches to fisheries management and enforcement. For example, the Directorate of Fisheries produce a risk analysis for the Coast Guard, enabling a strategic, risk-led approach to surveillance and best use of available resources over the large area monitored. The fisheries MCS system in Iceland has at its core the effective use of available technology meaning relatively small staff numbers can achieve extensive monitoring of the Icelandic fishing industry.

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

The Coast Guard uses several different but complementary electronic vessel monitoring systems including satellite-based systems comprising VMS and use of satellite imagery, the monitoring of coastal activity through a dedicated land-based very high frequency (VHF) system and the use of the Automatic Identification System (AIS). The assessment team has visited the Operation Centre and witnessed these systems in use.

The VHF and AIS systems have a range of 30 – 60 nautical miles while the satellite-based VMSs can be used anywhere in the world. The use of complementary systems ensures that the limitations that arise when any one system is used in a standalone capacity are mitigated. These electronic MCS systems are further backed up by more traditional methods of surveillance such as patrol vessels and aircraft; indeed, the use of

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

electronic systems in the effective targeting of traditional surveillance methods increases the efficiency of these systems. Recently satellite imagery has been added to the list of surveillance methods (80 images are taken each month) which can be used for example in detection of the uncommon occurrence of vessels not using VMS (Coast Guard pers. comm., site visit November 2018).

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

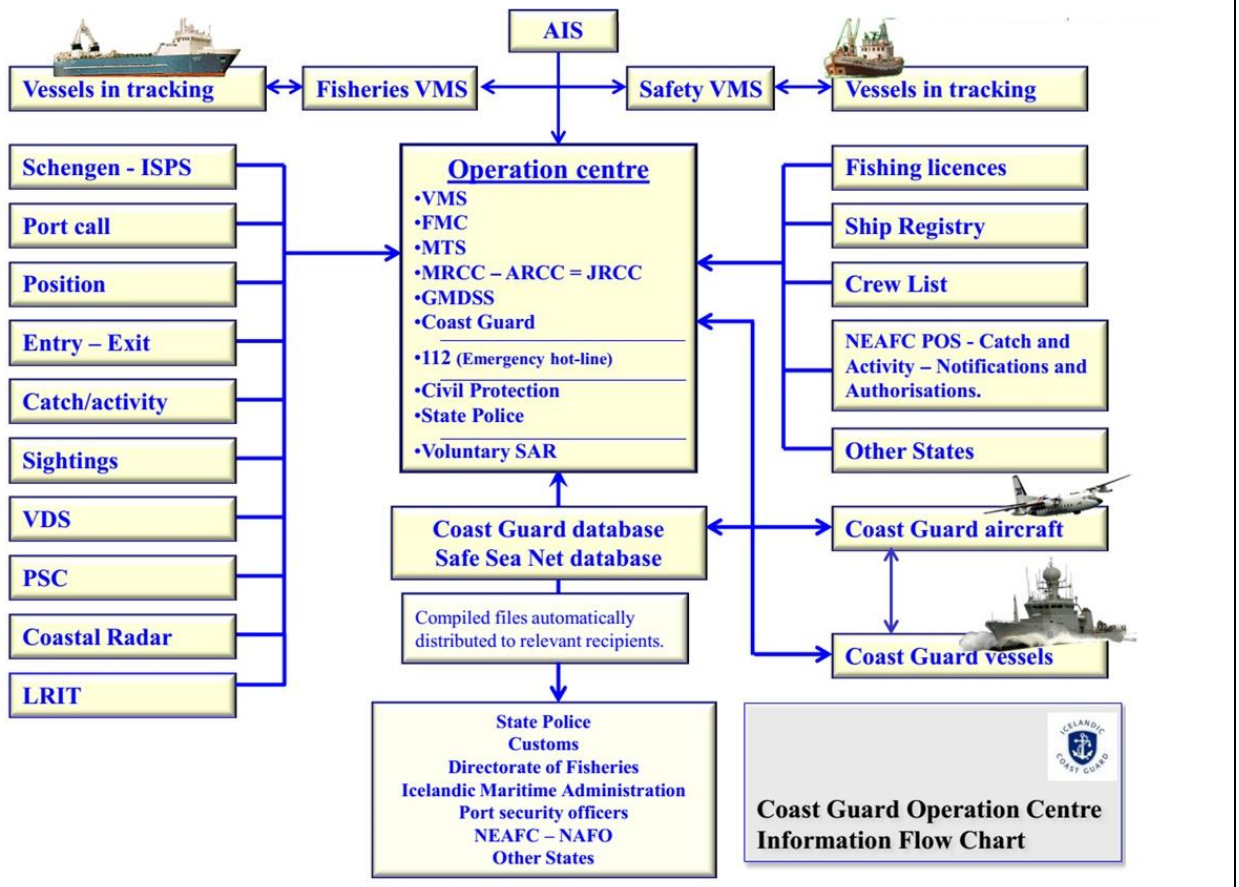



**Figure 48.** Schematic outlining the inputs which make up the integrated Monitoring, Control and Surveillance (MCS) system in Iceland (Source: presentation entitled Iceland's application for membership of the EU. Chapter 13, 28 February Icelandic Coast Guard ERS/VMS/AIS[185]).

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

Data on coastguard enforcement activity in the past year has been provided in Clause 2.1.

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

Inspectors of the Fisheries Directorate also accompany fishing vessels at sea during which they check fishing methods and catches, including gear configuration, mesh sizes, validity of fishing permits, the weighing and recording of catches as well as the species and size composition of the catch. The catch of vessels that are permitted to fully process catches on board is converted into a live weight based on the measured utilisation of the catch. The inspectors check that samples taken to monitor this process are correctly taken and accurately reflect the processing utilisation[186] [187]. Days spent by inspectors of the Fisheries Directorate at sea inspecting vessels as a proportion of total fishing effort are shown in the table below. Most effort is directed at the highest risk gillnet fisheries. Inspectors also undertake in-port inspections, to inspect logbooks and monitor the landing of catches and ensure that they are correctly weighed and recorded, according to legal requirements.

**Table 13.** Inspector days on fishing vessels (Source: Directorate of Fisheries, November 2018 site visit).

| Fishery type | Bottom Trawl | Longline | Gillnet (include lumpfish fishery and cod fishery) |
|---|---|---|---|
| 2017/2018 days | 570 | 202 | 152 |
| 2017/2018 coverage % | 1.93% | 0.64% | 3.64% |

Fisheries Directorate Inspectors also measure the length of the fish caught and if the percentage of fish below the minimum legal size in the catch exceeds a specified threshold, a proposal is submitted to the MFRI to temporarily close the fishing grounds with immediate effect. These (sudden) closures generally lasts for two to three weeks. The decision to temporarily close an area does not require Ministerial approval. If there is considered to be sufficient reason to close the fishing grounds for a longer period such as three temporary closures in the same area, the Minister may issue a regulation to this effect. Both temporary/sudden and long-term (regulatory) closures are primarily monitored and enforced by the Icelandic Coast Guard using the VMS system; while the main role of VMS tracking is geared towards safety the spatial nature of the available data allows closed areas to be monitored remotely. Vessels fishing in proximity to closed areas are monitored at the Coast Guard operation centre and vessels are directly contacted if they encroach on prohibited areas; this is the first point at which the Coast Guard operator may issue a warning to the vessel and decide to escalate if necessary.

| **References:** | See footnotes. |
|---|---|
| **Non-Conformance Number (if relevant)** | **NA** |

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

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

### 1.1.3.2.2. Clause 2.3.2.2.

The fishing gear shall be subject to inspection, as well as the composition of the catch and its handling onboard the fishing vessels.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**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.**

**Evidence:**
As noted in clause 2.1.1 and 2.3.2.1 fishing vessels are subject to surveillance at sea by the coastguard and Inspectors of the Fisheries Directorate. The Coastguard conduct unannounced at-sea vessel boarding's in order to inspect gear, catch and catch records including logbooks as well as to perform inspections of mandatory safety equipment.

The Directorate's inspectors also accompany vessels on fishing trips during which they check fishing methods and catches, including gear configuration, mesh sizes, validity of fishing permits, the weighing and recording of catches as well as the species and size composition of the catch. The catch of vessels that are permitted to fully process catches on board is converted into a live weight based on the measured utilisation of the catch. The inspectors check that samples taken to monitor this process are correctly taken and accurately reflect the processing utilisation[188],[189].

On land, inspectors from the Directorate of Fisheries inspect logbooks and monitor the landing of catches and ensure that they are correctly weighed and recorded, according to legal requirements. Surveillance is strategic and risk-based, using information supplied by the Fisheries Directorate to identify highest risk activities where monitoring effort is then concentrated. For example, at present inspector coverage is focussed on the gillnet fisheries (3.64% of trips accompanied by inspectors) compared to 1.93% and 0.64% of bottom trawl and longline fishing trips, respectively (see clause 2.3.2.1).

Discards are estimated by comparing length of the catch composition between vessels that have Directorate Inspectors on board and those that do not, while fishing in relatively close proximity to one another and at the same time. Further information is available under clauses 2.1.1 and 2.3.2.1.

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[188] The Icelandic Directorate of Fisheries – Responsibilities and main tasks. Page 8. http://www.fiskistofa.is/media/utgefid_efni/DOF.pdf
[189] Fiskistofa Annual Report, 2017. Maritime surveillance chapter. http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-sjo/

### 1.1.3.2.3. Clause 2.3.2.3.

Areas closed from fishing shall be monitored by the authorities.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**Areas closed to fishing are monitored by the Coast Guard using the VMS system. Vessels fishing in proximity to closed areas are monitored at the Coast Guard Operation Centre and vessels are directly contacted if they encroach on prohibited areas.** | | | | |
| **Evidence:**<br>Closures can be short-term (sudden closures) or long-term (regulatory closures)[190] and are primarily monitored and enforced by the Icelandic Coast Guard using the VMS system[191]. Vessels fishing in proximity to closed areas are monitored at the Coast Guard Operation Centre and vessels are directly contacted if they approach or encroach on prohibited areas; this is the first point at which the Coast Guard operator may issue a warning to the vessel and decide to escalate if necessary.<br><br>Further information on the Coast Guard Monitoring, Control and Surveillance system is presented in clause 2.3.2.1. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

[190] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Krokaaflamarksbatar
[191] http://www.lhg.is/media/LHG80/Landhelgisgasla_Islands_enska2_.pdf

### 1.1.3.2.4. 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.

| **Evidence Rating:** | Low ☐ | **Medium** ☑ | | High ☐ |
|---|---|---|---|---|
| **Non-Conformance:** | Critical ☐ | Major ☐ | **Minor** ☑ | None ☐ |

**Summary Evidence:**

**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. Therefore, the Assessment Team have deemed a Minor Non-conformance to be appropriate in this instance. Following the issuance of this non-conformance, and in accordance with rules of the IRF Programme, the Client has submitted a Corrective Action Plan (CAP) to address the non-conformance raised within a defined period. Corrective Actions in place are to be reviewed annually at surveillance audits.**

**Evidence:**

Vessel operators are required by law to up-date and transmit data on fishing activity after each haul (fishing event occasion). For small vessels that operate without an electronic logbook (below 6GRT) a report of catches must be submitted on landing.

Logbook recording of marine mammals and seabirds' bycatch by number and species is required by Icelandic regulation[192]. 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 inspectors. 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 Pálsson *et al.* 2015[193] and the March 2018 MFRI report entitled: "Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017".

Pálsson *et al.* 2015 highlighted the fact that their bycatch estimates were based on limited data that needed to be increased and improved with a functioning reporting system for the fishery and better follow up.

According to a 2017 presentation to NAMMCO's Working group on bycatch of marine mammals in Iceland; *"logbooks have unfortunately proven unreliable"* and *"bycatch of birds and marine mammals* [is] *18x higher when observer is present vs logbook records"*.[194]

The MFRI 2018 report found that although reported bycatch in E-logbooks by the fleet has increased

[192] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967
[193] https://www.hafogvatn.is/static/research/files/fjolrit-178pdf
[194] https://nammco.no/wp-content/uploads/2017/04/nammco-meeting-iceland-gms.pptx

(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 4 times higher than reported by the fleet in 2017 in logbooks[195].

Furthermore, the 2018 NAMMCO Scientific Working Group on By-catch recommended that the species identification on the logbooks be improved, perhaps with a picture of the species at different life stages appearing when the species ID is to be entered in the electronic logbook.

While much of the evidence related to non-compliance with reporting requirements may relate to the lumpsucker fishery, this fishery is part of the same management system under review and in addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better; therefore, the Assessment Team issued a Minor Non-conformance in December 2018 during the 4th surveillance activity for this fishery.

**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.**

Status: Open, Corrective Actions in place to be reviewed annually in subsequent audits.

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.

| **References:** | See footnotes. |
|---|---|
| **Non-Conformance Number (if relevant)** | **#1** |

[195] https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

#### 1.1.3.2.5. Clause 2.3.2.5.

Fishing logbooks shall be subject to unannounced inspection.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**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.** | | | | |
| **Evidence:**<br>It is a legal requirement that vessels give inspectors of the Fisheries Directorate and the Coast Guard access to their logbooks (see Article 8 of regulation on logbooks No. 746/2016)[196]. As noted in clause 2.3.2.2, 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 as well as checking them during fishing trips at sea where they witness various aspects of fishing operations. | | | | |
| **References:** | See footnote. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

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

### 1.1.3.2.6. Clause 2.3.2.6.

The timely and correct recording of catches in fishing logbooks shall be monitored by comparing the recorded catch amounts with the catch stored aboard the vessel at time of inspection.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**The timely and correct recording of catches in fishing logbooks is monitored by comparing the recorded catch amounts with the catch stored aboard the vessel at time of inspection. Inspections involve at-sea boardings by the Coast Guard and on fishing trips accompanied by Fisheries Directorate inspectors.**

**Evidence:**

The timely and correct recording of catches in fishing logbooks is monitored during random unannounced vessel boardings both at sea or at the quayside. These inspections include a comparison of the recorded catch amounts with the catch stored aboard the vessel at time of inspection. As noted in clause 2.3.2.2, the Coastguard conduct unannounced at-sea vessel boarding's during which catch and catch recording is checked. The Fisheries Directorate's inspectors accompany vessels on fishing trips during which they also check catches and the weighing and recording of catches – including on catcher processor vessels. Checks are also performed by inspectors in port.

The results of some of these inspections can be seen in the supporting evidence for Clause 2.1.1 which presents the main reasons for the generation of remarks during Coast Guard inspections in 2017. Remarks related to discrepancies between declared and actual catch fall under the "Veiðar" or "Catch" category. Clause 2.1.1 also presents information on the results of inspections by the Fisheries Directorate including monitoring of logbooks and the detection of violations and enforcement action subsequently taken.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.2.7. Clause 2.3.2.7.

Discarding of catch from the stock under consideration shall be prohibited. Discarding that may occur shall be monitored, e.g. by estimating amount of catch discarded due to size based high grading by species, season, gear type and area as feasible. The method for the monitoring of discards shall be specified.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

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

**Evidence:**
Discarding of commercial species is prohibited by law in Iceland (Article 2 of the Act Concerning the Treatment of Commercial Marine Fish, No. 57/1996) and this includes cod. This means that if vessels do not have sufficient quota to cover the species they have caught they are required to attain quota through the quota transfer system. Consequently, if vessels do not have sufficient catch quotas for their probable catches they must suspend all fishing activities. Discarding is subject to penalty[197] (400,000 to 8,000,000 ISK or about 3,000 to 60,000 EUR). As noted in previous clauses, catches are monitored and should the composition of the catch (species, size) or its quality differ from other vessels fishing in the vicinity, the Fisheries Directorate has powers to place the vessel under closer surveillance by placing an inspector on board for one day or fishing trip. The vessel must pay the Directorate's costs (e.g. inspector wages) if this occurs more than once in a fishing year (Article 13 of Act No. 57/1996).

The discard ban has some inbuilt flexibility, as any 5% of demersal catches from a fishing trip (called VS catch), irrespective of fish species or size, may be excluded from quota restriction (which means that VS catches are additional to the TAC). On sale of VS catches in public fish markets 20% of the revenue generated is paid to the vessel with the remaining 80% going to a designated research and development fund (the Fisheries Commission Project or 'VS fund', under the auspices of the Ministry). The maximum of 20% return on VS catches means that there are limited incentives to land it; however, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, preventing discards, improving the treatment of the fishery resource and promoting responsible fishing practices.

A discard project has been established by the Fisheries Directorate, in collaboration with the MFRI, to examine and evaluate discarded fish under a specific length and with a specific fishing gear. The project focusses on cod and haddock. The results of the research are published in MFRI's annual report. In 2018, inspectors measured 115,520 fish, 83,016 cod and 32,502 haddock. [198]

[197] https://www.althingi.is/altext/pdf/131/s/0982.pdf
[198] Fiskistofa Annual Report, 2017. Maritime Surveillance section. http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-sjo/

These studies indicate discard rates of a few percent and covers discards of smaller fish through high-grading. It is not clear what caused the increase in 2015. In the past, discards may have been higher. Anecdotal information indicates that it may have been substantial even prior to the 1990s.

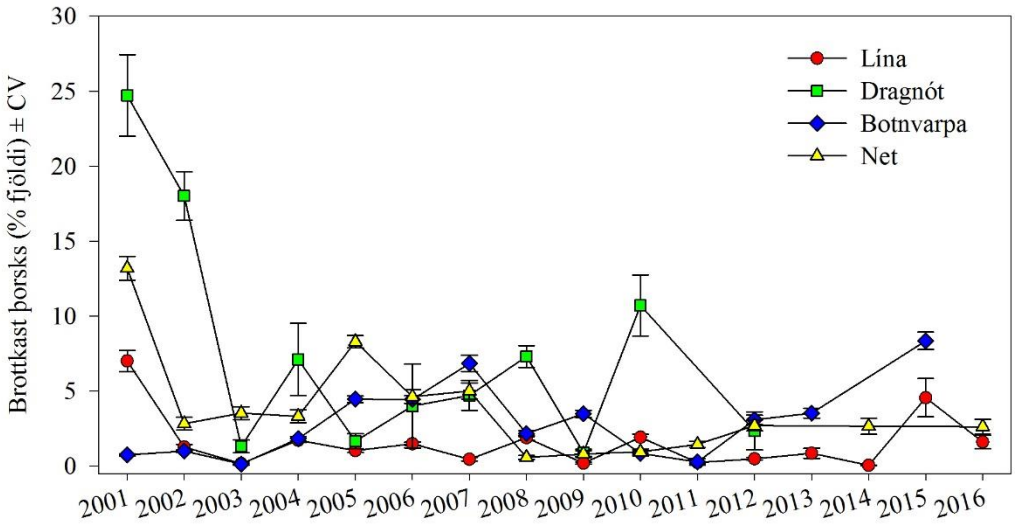



**Figure 49.** Estimated discards in percentage of numbers of cod by gear type. Red: Longline, Green: D. seine, Blue: Demersal trawl, Yellow: Gillnets.

Coast Guard are also investigating other ways to enhance the detection of discarding drawing on experience elsewhere (Norway) and other technologies including aerial surveillance (pers. com. site visit, November 2018).

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.2.8. Clause 2.3.2.8.

Vessels must comply with relevant national fishery management measures, which may include; TAC and quota allocations, effort management measures (e.g. days at sea, access limitation, gear restrictions, maximum allowable proportion of undersized fish, closure of areas with a high proportion of fish recruiting to the fishery, etc.), and technical conservation measures (e.g. mesh size and other gear selectivity measures).

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Vessels are required by law to comply with relevant national fishery management and technical conservation measures.**

**Evidence:**
Vessels are required by law to comply with fishery management and technical conservation measures, through the laws and regulations summarised in clause 2.1.1 and compliance is monitored through remote surveillance and inspections at sea and on land by the Coast Guard and the Fisheries Directorate with penalties applied where violations are detected.

Between 2014 and 2017 there have been 97 infringements recorded by the Coast Guard. The main reasons for the generation of remarks during Coast Guard inspections have largely remained consistent in recent years or declined. The most significant numbers of infringements related to manning lists (lögskráningar) and seaworthiness (Haffæri). Only one infringement relating to fisheries (Veiðar) was recorded in 2017.

By far the main suspected offenses detected by Fiskistofa in 2018 relate to logbooks, specifically not submitting them in the required timeframes (399 in 2018), and the late balancing of additional quota required (which must be done within 3 days from fishing event) (1162 in 2018).

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[199].

See evidence presented in clause 2.1.1.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

[199] http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en

### 1.1.3.2.9. Clause 2.3.2.9.

Monitoring and control measures shall be in place and shall be conducted in a manner to encourage and demonstrate compliance (and deter unreported landings).

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Monitoring and control and surveillance measures are in place. The Icelandic management model has been designed to promote compliance through reporting and includes provisions which create flexibility, enabling fishers to avoid non-compliance with rules and regulations and effectively encourages compliance. The rapid reporting system further encourages compliance through near real-time information on the catch of each vessel, quota allocation and transfers. This transparency in effect introduces an element of 'self-policing' into the management system.**

**Evidence:**

The monitoring, control and surveillance system has been described in clause 2.1.1. Please refer also the previous clause 2.3.2.8. The Icelandic 'management model' has been designed to promote compliance through reporting. There are provisions within the system which create flexibility, enabling fishers to avoid non-compliance with rules and regulations and effectively encourages compliance. Compliance is monitored through remote surveillance and inspections at sea and on land by the Coast Guard and the Fisheries Directorate with penalties applied where violations are detected.

The system is transparent with information relating to quota allocations and performance of individual vessels in the fleet being readily publicly available[200]. The rapid reporting system encourages compliance through near real-time information of catch for each vessel, quota allocation and transfers. This transparency in effect introduces an element of 'self-policing' into the management system.

| | |
|---|---|
| **References:** | See footnote. |
| **Non-Conformance Number (if relevant)** | **NA** |

[200] http://www.fiskistofa.is/fyrirspurnatorg/fyrirspurnir-tengdar-afla/

### 1.1.3.2.10. Clause 2.3.2.10.

Catches shall be landed in authorised fishing ports. Authorised fishing ports provide the necessary facilities for handling and weighing of the catch.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Law requires that all catches by Icelandic vessels from Icelandic waters must be landed and weighed in an Icelandic port. Weighing is undertaken on official port scales, or on other approved scales at private companies or Fish Markets, that have been certified by the Fisheries Directorate and operated by individuals authorised by the Directorate. The Fisheries Directorate maintains a list on their website, organised by port, of all official Icelandic weighing license holders that they audit and the type of weighing license held.**

**Evidence:**

The Treatment of Commercial Marine Stocks Act 57/1996 and Regulation No. 745/2016 on the weighing and registration of marine catch require that all catches by Icelandic vessels from Icelandic waters must be landed and weighed in an Icelandic port. Exceptions are made for special circumstances e.g. serious engine failure in which case the Fisheries Directorate may authorise landings abroad (Article 5 of Act No. 57/1996).

The Directorate maintains a list, organised by port, of all official Icelandic weighing license holders that they audit and the type of weighing license held on their website[201]. Landings were previously permitted at authorised foreign ports, but this is no longer the case following Regulation No. 745/2016 (Article 1)[202].

Weighing is undertaken on official port scales certified by the Fisheries Directorate and operated by individuals authorised by the Directorate. Weighing may also occur on one of the other approved systems such as private companies or Fish markets authorised by the Fisheries Directorate under the provisions of the Regulation No. 745/2016 on Weighing and Recording of Marine Resources.

During the site visit on the 27th November 2018, the assessors visited a fish market and were shown the landed fish, weighing scales and the information recorded on the system which goes to the Port Authority who then submit it to the Fisheries Directorate's catch registration system (GAFL).

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

[201] http://www.fiskistofa.is/fiskveidistjorn/vigtunafla/

[202] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0745-2016

### 1.1.3.2.11. Clause 2.3.2.11.

In cases of mixed species catches, all commercial species shall be landed.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Discarding of commercial species is prohibited by law and all commercial species must be landed. All commercial species are separated and declared by logbook and landed weight. This is monitored by Fisheries Directorate inspectors and penalties are in place for non-compliance.**

**Evidence:**
Discarding of commercial species is prohibited by law and all commercial species must be landed (Act Concerning the Treatment of Commercial Marine Fish, No. 57/1996). All commercial species are separated and declared by logbook and landed weight (Article 9, Act No. 57/1996). This is monitored by Fisheries Directorate inspectors and penalties are in place for non-compliance.

The vast majority of species assessed by the MFRI are part of the quota system (see their advice page[203]). In addition to formal quota species, there are a suite of other commercial species which are landed. The Directorate's website has a public search function which lists 65 of these species[204]. Some of these are species for which there is a ban on direct fishing (e.g. Atlantic halibut, certain sharks, etc…) but that are landed as part of the discarding prohibition. Others do not have a formal National TAC but are landed and sold commercially.

During the site visits, the Assessment Team witnessed one Atlantic halibut landed at the Reykjavik Fish Market and sold as VS catch (80% of earning going to a research fund). A table of VS catches for key commercial species in the 2018/19 season is provided below.

**Table 14.** VS catches of cod, haddock, saithe and redfish in the fishing year 2018/2019[205].

| Species | Catch (kg) per season (1st of September 2018 to 31st August 2019) | | | | Total (kg) |
|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | |
| **Cod** | 193,130 | 204,813 | 665,117 | 184,722 | 1,247,782 |
| **Haddock** | 27,685 | 5,394 | 45,203 | 3,203 | 81,485 |
| **Saithe** | 672 | 6,484 | 10,395 | 723 | 18,274 |
| **Redfish / redfishes** | 1,164 | 407 | 16,464 | 3,358 | 21,393 |

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[203] https://www.hafogvatn.is/en/harvesting-advice
[204] http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/
[205] http://www.fiskistofa.is/veidar/aflastada/vs-afli/vsafli.jsp

### 1.1.3.2.12. Clause 2.3.2.12.

Landings shall be monitored. Harbor officials and fisheries inspectors shall monitor the correct weighing and registration of the catch.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Landings are monitored. Port authority officials and Fisheries Directorate inspectors monitor the correct weighing and registration of the catch. New powers have been enacted through legislation to address the risk posed by incorrect weighing of ice.**

**Evidence:**
The legal requirements on the monitoring of landings and the weighing and registration of catch are comprehensive. They are set out in Act No. 57/1996 concerning the Treatment of Commercial Stocks, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources. Inspectors from the Directorate of Fisheries inspect logbooks and monitor the landing of catches and ensure that they are correctly weighed and recorded according to the legal requirements. Port authorities also have a role in this process.

All Icelandic catches from Icelandic waters must be landed and weighed in registered Icelandic port. Exceptions are made for special circumstances e.g. serious engine failure in which case the Fisheries Directorate may authorise landings abroad (Article 5 of Act No. 57/1996).

Separation by species (if not already done on board), weighing and recording of the catch must occur within two hours of landing. Weighing is undertaken on official port scales certified by the Fisheries Directorate and operated by individuals authorised by the Directorate.

As required by Article 10 of Regulation No. 745/2016, each landing generates a weighing receipt[206,207] recording:

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

[206] https://www.fmis.is/blank
[207] http://www.unuftp.is/static/fellows/document/pan09prf.pdf

The information is sent within 1 day by port authorities to the Fisheries Directorate who record it on their Catch Registration System. The Directorate also receives the e-logbook information. These two sets of information are compared, and the appropriate reduction is made to the vessel quota. Any transfer under the ITQ system for each vessel is also monitored to ensure that any additional quota requirements are rented from other vessels within a 3-day period. The reporting system is very near real time (circa. 24 hours). 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.

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'[208]. Fish markets can also be authorised to weigh catches by the Directorate. These private companies and fish markets are required to send weighing information to the relevant port authority who then submit it to the Fisheries Directorate's catch registration system. There are also legal requirements covering the licensing of the re-weighing of catch or weighing after gutting on land which are also monitored.

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. Monitoring of weighing license holders is risk-based with the aim of directing surveillance where it is most needed. Assessment of risk is based on various factors such as the quantity weighed, number of weighings, the number of vessels that land with the licensee concerned, etc. Recently, attention has been focussed on the percentage of ice measured during weighing of catches by weighing licensees. After gross weighing on the port scale, it is permissible to send catch for re-weighing in fish processing companies or on a fish market which has been authorized for re-weighing catch. The catch is then either balanced or sampled according to certain rules, ice is separated, and the net weight of the fish is found.

To address the risk posed by incorrect weighing of ice, in 2017 the Act on the Treatment of Marine Fish Stocks (Act No. 57/1996) was amended by Act No. 48/2017 (Act amending the Act on the Treatment of Marine Fish Stocks and the Act on the Directorate of Fisheries (monitoring of weighing license holders))[209]. The Act 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. The license holder is required to pay all the costs of this monitoring. Repeated infringements can result in result in suspension of the weighing license holder for up to a year. The Directorate of Fisheries began applying this measure in the autumn of 2017.

| **References:** | See footnotes. |
|---|---|
| **Non-Conformance Number (if relevant)** | **NA** |

[208] http://www.fiskistofa.is/fiskveidistjorn/vigtunafla/
[209] https://www.althingi.is/altext/stjt/2017.048.html

### 1.1.3.2.13. Clause 2.3.2.13.

Catch shall be weighed by species at landing.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**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 law.**

**Evidence:**

As noted in clause 2.1.1, within two hours of landing, catches are officially separated, weighed and recorded by accredited weighing stations and reported against the appropriate quota allocation following provisions outlined in the Act No 57, 1996 concerning the Treatment of Commercial Stocks, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources.

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

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

During the site visit on the 27th November 2018, the assessors visited a fish market and were shown the landed fish, weighing scales and the information recorded on the system which goes to the Port Authority who then submit it to the Fisheries Directorate's catch registration system (GAFL). Both the weighing scales and their operators are licensed and audited by the Directorate. Fish are stored in crates with the catch labelled for the purposes of traceability. We were also shown the equipment used to measure ice.

See Clause 2.1.1 for further information.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.2.14. Clause 2.3.2.14.

The weight (whole weight or gutted weight) by species of all catches of stock under consideration and by-catch species shall be measured by authorised harbour officials at landing and recorded in the official central data base (date, vessel, gear type, location, species, quantity).

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The weight (whole weight or gutted weight) by species of all catches and by-catch species is measured by authorised harbour officials at landing and recorded in the Fisheries Directorate's catch registration system.** | | | | |
| **Evidence:**<br>As noted in clause 2.1.1, within two hours of landing catches are officially separated, weighed (whole weight or gutted weight) and recorded by accredited weighing stations and reported against the appropriate quota allocation following provisions outlined in the Act No 57, 1996 concerning the Treatment of Commercial Stocks, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources.<br><br>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 vessels quota and management purposes by staff at the Directorate.<br>See also the evidence presented in clause 2.3.2.13. | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

### 1.1.3.2.15. Clause 2.3.2.15.

There is systematic monitoring of landing, weighing and registration of catches and discrepancies/deviations shall be recorded.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**There is systematic monitoring of landing, weighing and registration of catches with all catches being weighed and recorded at the port of landing by an official weigher using licensed scales before the official catch is recorded on a central catch registration system. The Fisheries Directorate compares information on catches from the portside official weighing system with the corresponding logbook entry for that landing and discrepancies/deviations are recorded and investigated.**

**Evidence:**

As noted in clause 2.1.1, there is systematic monitoring of landing, weighing and registration of catches with all catches being weighed and recorded at the port of landing by an official weigher using licensed scales before the official catch is recorded on a central catch registration system (The Fisheries Directorate and Port Authorities database, GAFL).

The Fisheries Directorate compares information on catches from the portside official weighing system with the corresponding logbook entry for that landing before the appropriate reduction is made to the vessel's quota. At this point in the discrepancies/deviations between the declared and official records of a landing are detectable if present and are recorded. Depending on the nature of the discrepancy/deviation the Fisheries may then decide whether or not further action is warranted.

See Clause 2.1.1 for further information.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.2.16. Clause 2.3.2.16.

Reasons for deviations shall be analysed and corrections made to reduce the likelihood of recurrence.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Data related to landings are processed in the Directorate´s database and catches are subtracted from vessels' quotas. Deviations where they occur can sometimes be rectified using the flexibility within the system (e.g. by using inter-annual, inter-vessel or inter-species transfers to cover catches of a species for which the vessel did not already have quota). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines.**

**Evidence:**

As noted in clause 2.1.1, data related to landings are processed in the Directorate´s database and catches are subtracted from vessels' quotas. The system is designed such that reports are received in near real-time so that the Directorate can act quickly if vessels are approaching the end of their quotas. In addition, vessels are aware or can easily check online their current quota status for a particular species. All processors purchasing fish, be it directly or at auction, are obliged to submit monthly reports to the Directorate. In addition, the fish auction reports all sales of fish directly to the Directorate.

Deviations where they occur can sometimes be rectified using the flexibility within the system (e.g. by using inter-annual, inter-vessel or inter-species transfers to cover catches of a species for which the vessel did not already have quota). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines[210].

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.

See Clause 2.1.1 for further information.

| | |
|---|---|
| **References:** | As referenced. |

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

[210] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Vidurlog

### 1.1.3.2.17. Clause 2.3.2.17.

In cases of passive fishing gear left unattended at sea, there shall be regulation that requires fishing gear to be marked so that the owner can be identified, where relevant.[211]

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Icelandic cod is caught for the most part by the Icelandic bottom trawl and longline fleets in directed fisheries. However, cod is also caught by gillnet and Danish seine fisheries. Longline and gillnet fisheries are relevant to this clause. There are regulations that require passive fishing gear left unattended at sea to be marked so that the owner can be identified.**

**Evidence:**

Icelandic cod is mostly caught by the Icelandic bottom trawl and longline fleets in directed fisheries. However, cod is also caught by gillnet and Danish seine fisheries. Longline and gillnet fisheries are relevant to this clause.

There are a number of initiatives and regulations in place to avoid the loss of fishing gear and subsequent ghost fishing of lost and abandoned gear. Where the Fishing Directorate finds and recovers lost or abandoned gear they recover the cost of recovery from the gears' owner. The Coastguard also reports any buoys it feels might represent lost or abandoned fishing gear to the Directorate. All regulations relating to fishing gear may be found in the various Articles of Fisheries Management 2018/19 Laws and regulations[212]. During the November 2018 site visits, the directorate confirmed that gear loss (e.g. longlines, gillnets) and as such ghost fishing is not considered an issue and that reporting lost gear is compulsory.

In Iceland there are specific gear marking regulations for anchored bottom set gillnets targeting cod. These provisions are contained in Regulation No. 115 of 13 February 2006[213]. Article 4 states that all anchors for set nets must be marked with the district registration and number of the boat. Buoys must be fixed at both ends of the nets and buoys must be marked clearly with district registrations and the number of the boat. Article 5 states that the buoy attached at the west end of the nets must be marked with a net-ring (a floating ring ~ 20 cm in diameter). If nets are set in an area where bottom trawling also occurs the west end buoy must be marked with one white blinking light.

Another important factor that contributes to low levels of lost fishing gear is the high price of that gear. This means that fishers are careful to avoid losing their gear. In the case of trawls the majority of vessels carry special grapples onboard that allow them to retrieve lost gear even when both towing warps have parted, which is a rare situation.

[211] This clause is applicable to gillnets, traps and pots.
[212] http://vefbirting.oddi.is/raduneyti/fiskveidar2018/108/
[213] http://www.reglugerd.is/reglugerdir/allar/nr/115-2006

| | |
|---|---|
| The Icelandic ITQ system allows for a slower paced fishery than would be expected if there was only an overall TAC with all boats fishing against it. The system allows fishers to target their efforts in optimum weather conditions leading to decreased rates of lost fishing gear. | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.3. Clause 2.3.3. Catches are subtracted from relevant quotas

#### 1.1.3.3.1. Clause 2.3.3.1.

Landed catches shall be subtracted from the relevant quotas (allowable catch) of the vessel or vessel group.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

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

**Evidence:**

As noted in clause 2.1.1, information from fresh fish landings is collected through the portside official weighing system which is carried out by official staff and calibrated systems. Vessels must weigh catch within two hours of landing on the quay. The system is developed to standardise weights and tares for ice and tubs (a standard tub is used throughout Iceland for fresh fish such as cod and has a capacity of 280-300 kg). The weight registration document for each vessel is transmitted to the Directorate which also receives the e-logbook information. These two sets of information are then compared, and the appropriate reduction is made to the vessel quota. Any transfer under the ITQ system for each vessel is also monitored to ensure that any additional quota requirements are rented from other vessels within a 3-day period as required by law (Act No. 57/1996). The reporting system is near real time (circa. 24 hours).

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

Processed at sea catch is registered as processed weights using an officially approved yield. This is monitored and verified by the Directorate staff. Weights at landing are checked at the processing base by Directorate staff. Processed weights are converted to live weight equivalents for deduction from each vessel's quota and management purposes by staff at the Directorate.

See clause 2.1.1 for further information.

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.3.2. Clause 2.3.3.2.

Limited allowance may be made for the use of quota for one species to count against landings of another species, with the objective of providing the necessary minimum flexibility and discouraging discards.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

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

**Evidence:**

As the Icelandic groundfish fishery is a mixed fishery it is necessary to incorporate a degree of flexibility in the quota management system so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels and to discourage discarding. There are a variety of provisions in place to facilitate flexibility and reduce any potential incentives relating to the discarding of fish.

In addition to within-species quota transfers between vessels and/or fishing seasons the system also makes provision for some limited quota transfer between different species. Interspecies transfers of quota are based on 'cod-equivalents' a nominal value based around the market value of cod which is set annually by the Ministry as set out in Article 19 of Act No. 116/2006[214]. Note that it is not possible to convert quota of other species for cod quota (e.g. cod quota may be exchanged for other species quota, but other species quota may not be exchanged for cod).

The cod-equivalent values of a number of representative species during the 2012/2013 to 2018/2019 season are presented in the table below. As can be seen the cod-equivalent value for more commercially valuable species is consistently higher across seasons. Cod equivalent values change seasonally.

**Table 15.** Cod-equivalent values of representative species during the recent fishing seasons (Source: http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/ ).

| **Species** | **Cod Equivalents** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Season** | **2012/2013** | **2013/2014** | **2014/2015** | **2015/2016** | **2016/2017** | **2017/2018** | **2018/2019** |
| *Cod (Þorskur)* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* |
| Haddock (Ýsa) | 0.92 | 1.15 | 1.30 | 1.23 | 1.04 | 1.07 | 1.05 |
| Saithe (Ufsi) | 0.73 | 0.82 | 0.81 | 0.77 | 0.79 | 0.72 | 0.62 |
| Golden redfish (Gullkarfi) | 0.82 | 0.89 | 0.85 | 0.79 | 0.69 | 0.60 | 0.63 |
| Norway lobster (Humar) | 4.70 | 6.46 | 5.98 | 5.98 | 6.10 | 8.12 | 9.54 |

[214] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Greenland halibut (Grálúða) | 2.47 | 2.67 | 2.59 | 2.48 | 2.65 | 2.61 | 2.43 |
| Anglerfish (Skötuselur) | 1.74 | 1.98 | 2.27 | 2.05 | 2.17 | 2.1 | 1.76 |
| Ling (Langa) | 0.59 | 0.73 | 0.76 | 0.68 | 0.68 | 0.73 | 0.74 |
| Tusk (Keila) | 0.39 | 0.52 | 0.51 | 0.47 | 0.42 | 0.38 | 0.40 |

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.3.3. Clause 2.3.3.3.

When a vessel's quota is used up, additional quota must be transferred to the vessel from other vessels or the vessel stops fishing.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**It is illegal to fish without quota and this is monitored closely by the Coast Guard and inspectors of the Fisheries Directorate. The quota management system includes a degree of flexibility so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels. Flexibility is facilitated by a number of provisions including the ability to use a limited amount of the following season's quota or to transfer a limited amount of unused quota to the following season, or transfer quota between species. Where a vessel has exhausted these options it must transfer quota from other vessels and if unable to do this it must stop fishing.**

**Evidence:**

As the Icelandic groundfish fishery is a mixed fishery there is a degree of flexibility in the quota management system so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels. There are a variety of provisions in place to facilitate flexibility in quota management and reduce any potential incentives relating to the discarding of fish:

A vessel can exceed its allocation for a particular species in a fishing season by up to, but not exceeding, 5%; the excess is then deducted from that vessels allocation for that species in the following fishing season.

Additionally, a decision may be taken to postpone fishing up to 15% of a vessel's quota for a particular species in a fishing season and transfer the balance to the following season[215]; this measure may be particularly beneficial to the growth of long-lived species in maximising the return from strong year classes.

It is also possible to make some limited quota transfer between different species. Interspecies transfers of quota are based on 'cod-equivalents' a nominal value based around the market value of cod which is set annually by the Ministry as set out in Article 19 of Act No. 116/2006[216]. Note that it is not possible to convert quota of other species for cod quota (e.g. cod quota may be exchanged for other species quota, but other species quota may not be exchanged for cod). The results of some of inter-vessel and inter-seasonal transfers aimed at balancing catches and quotas may be seen in under Clause 2.3.1.

Vessels may also decide not to include part of the vessels catch in its catch quota. This is limited to no more than 0.5% of the vessel's pelagic catch and 5% of other marine catches per fishing year. Further this catch, known as 'VS catch', must be kept separate from the rest of the vessel's catch and weighed and recorded separately; it must be sold at an approved auction and the bulk of the proceedings of the sale must go to the Fisheries Commission Project Fund (established by Act No. 37/1992), 20% going to the vessel (Article

[215] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Vidurlog
[216] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/

| | |
|---|---|
| 11, Act No. 116/1996).[217] The maximum of 20% return on VS catches means that there are limited incentives to land it; however, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, preventing discards, improving the treatment of the fishery resource and promoting responsible fishing practices.<br><br>Icelandic law prohibits fishing vessels going to sea without sufficient quota (Act No. 57/1996). This is monitored by the Fisheries Directorate inspectors and Coast Guard and penalties apply under the Act for violations of its provisions including suspension of the commercial fishing license (Article 14), the requirement to have an inspector on board the vessel for a period of time up to two months paid for by the vessel (Article 16), fines, and in the event of major or repeated deliberate violation, imprisonment for up to 6 years (Article 23). See clause 2.1.1 for further information on the results of this surveillance and enforcement. Consequently, where a vessel has exhausted its quota (including availing of all the additional quota it is allowed to generate within the rules) the only option it is left at that point is to transfer additional quota from other vessels and where it is unable to do so the vessel must stop fishing. | |
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

[217] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Sveigjanleiki_i_aflamarkskerfinu

### 1.1.3.3.4. Clause 2.3.3.4.

Transfer of quota between vessels shall take effect only after it has been authorised and recorded to the official central data base.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**All transfers of quota must be authorised by the Fisheries Directorate and do not come into effect until they have confirmed it. Information on the catch quota, including quota transfers, of each vessel or vessel group, is recorded in the Fisheries Directorate's official central database.** | | | | |
| **Evidence:**<br>All transfers of quota must be authorised by the Fisheries Directorate. The Directorate of Fisheries must be notified of the transfer of quota and must receive this no later than 15 days after the end of the fishing season. Application forms for the transfer of quota are available online[218] and must be transmitted directly to the Directorate for authorisation of the transfer. Information on the catch quota, including quota transfers, of each vessel or vessel group, is recorded in the official central database (GAFL) (see evidence presented in clause 2.3.1.3). | | | | |
| **References:** | As referenced. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

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

### 1.1.3.3.5. Clause 2.3.3.5.

Information on each vessels' catch quota and quota use shall be updated regularly and made public and accessible to all on the official website, thus ensuring transparency.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Information on each vessels' catch quota and quota use is updated in near real-time and is made public and accessible to all on the Fisheries Directorates web-site, thus ensuring transparency.**

**Evidence:**
As discussed previously, catch statistics are published by individual vessel and are readily available online in near real-time thus ensuring transparency[219]. For each vessel the information available for each species is:

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 (Note 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

For illustrative purposes see the table in the supporting evidence for 2.3.1.3 showing the first 20 lines of the publicly available data on individual vessels' quota allocations of cod in the 2018/2019 fishing season.

| | |
|---|---|
| **References:** | See footnote. |
| **Non-Conformance Number (if relevant)** | **NA** |

[219] http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en

### 1.1.3.4. Clause 2.3.4. Rules are enforced

#### 1.1.3.4.1. Clause 2.3.4.1.

Rules shall be enforced. There shall be penalties for serious infractions.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**There is a clearly established legal framework which sets out rules and regulations relating to fishing activity within Icelandic waters and the penalties for violation of these rules. It gives powers to the Ministry, the Fisheries Directorate, the Coast Guard and the MFRI to monitor fishing activities and enforce these rules. Penalties exist for serious infractions. This largely comprises administrative penalties ranging from guidance letters and reprimands to suspension of fishing permits and weighing licenses. More serious cases are sent to the police for prosecution under the criminal system which can result in imprisonment.**

**Evidence:**

There is a clearly established legal framework which sets out rules and regulations relating to fishing activity within Icelandic waters and gives powers to the Ministry, the Fisheries Directorate, the Coast Guard and the MFRI to monitor fishing activities and enforce these rules. The penalties for violation of the laws and regulations have been described in clause 2.1.1 and range from the issue of reprimands by the Directorate of Fisheries and the suspension of commercial fishing permits to confiscation of gear and catch, fines and, in cases of serious or repeated deliberate violation, imprisonment for up to six years (for example, Articles 24 and 25 of Act No. 116/2006[147]; Articles 15-17 of Act No. 79/1997[151]; Chapter 4 of Act no. 57/1996[149]).

On a day-to-day basis rules are primarily enforced by the Directorate through powers to collect levies, monitor, inspect, report and gather evidence for prosecution purposes where violations are suspected. All prosecutions resulting from enforcement activities are conducted via the Icelandic legal process (Ministry of Justice). Other at sea monitoring and inspection duties reside with the Coast Guard. In addition, the MFRI also has the legal power to enact temporary spatial closures.

A breakdown of inspection activities in 2017 with comparison with previous years was provided to the assessment team by the Coast Guard and is summarised in clause 2.1.1, alongside details of Fisheries Directorate Inspections.

Between 2014 and 2017 there have been 97 infringements recorded by Coast Guard monitoring and surveillance activity. The infringements detected have largely remained consistent in recent years or declined (figure below). In 2017, the most significant numbers of infringements related to manning lists (lögskráningar) and seaworthiness (Haffæri). Only one infringement relating to fishing (Veiðar) was recorded in 2017. Foreign vessels are also inspected – both in the Icelandic EEZ and further afield as part of Iceland's contribution to monitoring and surveillance as a member of NEAFC. In 2017, 18 foreign vessels were inspected which, in relation to fishing activities in the Icelandic EEZ, led to remarks to 2 Norwegian capelin fishing vessels due to gear infringements and to a Faroe Islands handline/jigger vessel for logbook infringement.

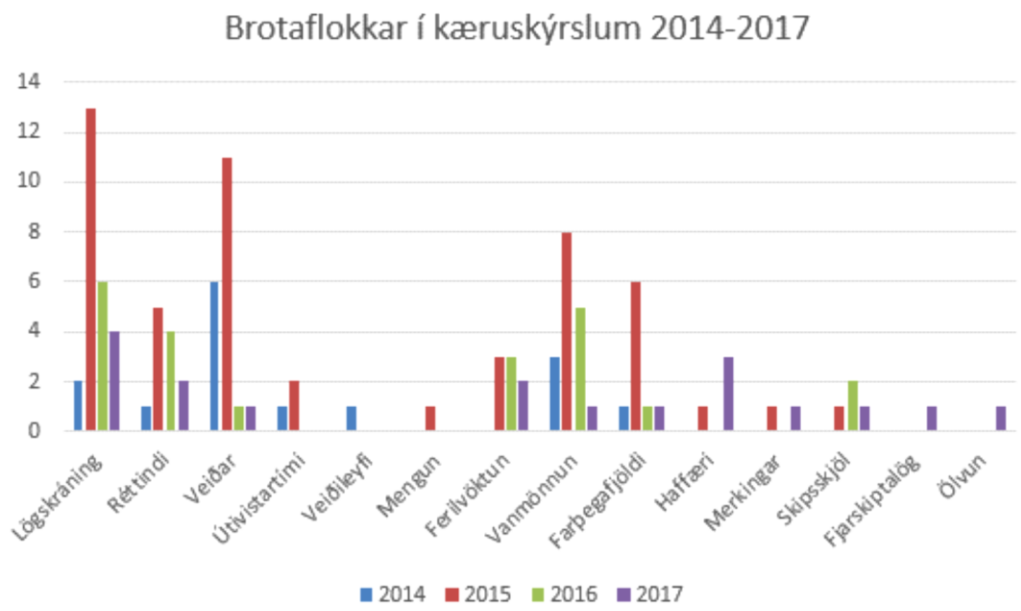



**Figure 50.** Reasons for the generation of remarks, by no. of remarks generated, during Coast Guard inspections in 2014-2017; Lögskráningar – Manning list, Réttindi – License, Veiðar – Fishing, Útivistartími – time limits for fishing, Veiðileyfi – Fishing permit, Mengun – Pollution, Ferilvöktun – VMS, Vanmönnun – Manning, Farþegafjöldi – Passengers, Haffæri – Sea worthiness, Merkingar – Marking, Skipsskjöl – Ship's papers, Fjarskiptalög – telecommunications, Ölvun - intoxication (Source: Coast Guard presentation provided to the assessment team, December 2018).

In their annual report, the Fisheries Directorate publish a comprehensive summary of suspected offenses recorded during maritime surveillance and the enforcement action subsequently taken (tables below). A comparison of some of the enforcement action taken in recent years is shown in. By far the main suspected offenses detected relate to logbooks, specifically not submitting them in the required timeframes (399 in 2018), and fishing in excess of or without quota (1162 in 2018). Much of the former arises from late submission of logbooks each month by small vessels using paper logbooks, with each instance registered as an offence. Similarly, the quota infringement relates to each incidence detected of vessels that have taken longer than the 3 days required by law to balance their quota where they have landed fish in excess of their quota (proceeding to fish without quota is a separate offence) (Pers. com. Fiskistofa).

Where a suspected violation of the fisheries management legislation has occurred, the case is referred to the Directorate's Legal Department for enforcement action. In 2017, 220 cases where referred, 131 in 2016. Breaches of the law are handled in several ways. Some cases are dropped and no further action taken, otherwise action taken ranges from the issue of reprimands, application of administrative fines, suspension or revocation of fishing permits and weighing licenses or, in a small number of cases, sent to the police for criminal action to be taken. There is also a specific chapter in the Annual Report summarising the imposition and collection of fees for illegal catches of fish in that year.

**Table 16.** Overview of suspected offenses recorded in Icelandic fisheries (Source: Fiskistofa Annual Reports 2018[220], 2017[221] and 2016[222]).

| Offenses recorded by Fiskistofa | 2018 | 2017 | 2016 |
|---|---|---|---|
| Violation of landing rules (broken down into:) | 31 | 52 | 60 |
| • *Not landing fish at official landing location* | 6 | *5* | 4 |
| • *Weighing container* | 19 | *10* | 13 |
| • *Misreporting (Landing full size fish as part of catches of juveniles)* | *6* | *9* | 22 |
| • *Incorrect specification of species* | *0* | *11* | 4 |
| • *Other* | *No data* | *17* | 17 |
| Discarding catch | 12 | 8 | 4 |
| Violation of fishing license rules | *No data* | 36 | 15 |
| Violation of lumpfish fishery rules | 39 | 19 | 11 |
| Violation of coastal fishery rules | 4 | 10 | 46 |
| Logbooks (broken down into:) | 457 | 719 | 689 |
| • *Not submitting logbooks on time* | *399* | *674* | 657 |
| • *Other* | *58* | *45* | 31 |
| Fishing in excess of or without quota | 1162 | 1201 | 1,060 |
| Violation of law on salmon and trout fishing | 3 | 1 | 2 |
| Other violations | 51 | 45 | 14 |

**Table 17.** Enforcement action taken (Source: Fiskistofa Annual Reports2018[223], 2017[161] and 2016[162]).

| Offences | 2018 | 2017 | 2016 |
|---|---|---|---|
| Violation of fishing rules | 49 | 97 | 31 |
| Violation of weighing and landing rules | 14 | 71 | 50 |
| Violation of logbook rules | 27 | 45 | 31 |
| Violation of processing catch rules | 2 | 0 | 2 |
| Case sent to Police | 4 | 1 | 4 |
| Reprimands issued (broken down below) | 92 | 96 | 79 |
| Due to violation of fishing rules | 14 | 50 | 14 |
| Due to violations of weighing and landing rules | 8 | 12 | 31 |
| Due to violation of logbook rules | 3 | 33 | 26 |
| Due to other violations | 0 | 3 | 8 |
| Suspension of fishing permit | 25 | 31 | 14 |
| Suspension of weighing license | 6 | 4 | 1 |
| Guidance letter sent | 7 | 6 | 6 |
| No action taken | 59 | 33 | 20 |
| Case sent to another authority | 5 | 1 | 1 |

[220] http://www.fiskistofa.is/media/arsskyrslur/8_Fiskistofa-15.-april-2019_Medferd-mala.pdf
[221] Fiskistofa 2017 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/medferd_mala_og_urskurdir.pdf
[222] Fiskistofa 2016 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/kafli8_2016.pdf
[223] http://www.fiskistofa.is/media/arsskyrslur/8_Fiskistofa-15.-april-2019_Medferd-mala.pdf

| | | | |
|---|---|---|---|
| Procedure still in progress | 53 | 46 | 8 |
| Case returned to the inspectors | No data | 2 | No data |
| **Fees** | | | |
| Reminder letter sent for unpaid fishing fees 2017 | 234 | 231 | 145 |
| Resulting in suspension of fishing permits | 78 | 89 | 85 |
| Fees imposed for illegal catches | 1150 | 1201 | 130 |
| Resulting in suspension of fishing permits | 77 | 25 | 65 |

| | |
|---|---|
| **References:** | See footnotes |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.5. Clause 2.3.5. Analysis is carried out

#### 1.1.3.5.1. Clause 2.3.5.1.

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

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

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

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

Since initial adoption for the Icelandic cod FMP in 2009/10, the Icelandic TAC has been set according to scientific advice from MFRI and ICES. Nevertheless, there has been some deviation of final catches from the decided TAC. Some reasons for that are readily identified:

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

In the past 5 years, catches of cod have exceeded quotas by an average of about 3.5% a year (range -2% to +6%), except in the fishing year 2016/17, where the total catch was slightly below the TAC. The table 18 and Figure 51 show the recent historical record of adherence to the quotas, according to the MFRI advice. Within the ITQ system, when transfers between years and species is taken into account (Table 18), the catches are very close to the quotas[224]. However, the amounts set aside for the fisheries outside that system tends to be below the actual catches.

224 http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/

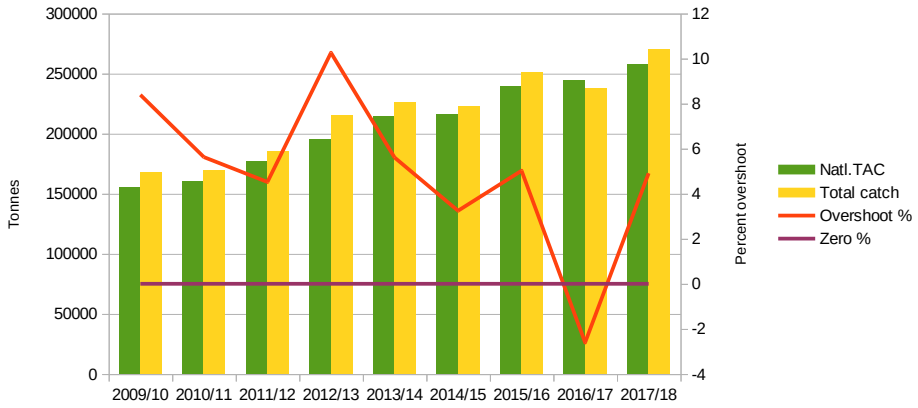



**Figure 51.** Historical record of adherence to the quotas, according to the MFRI advice.

Related to TAC, some relevant adjustments in management decision are shown below.

**Table 18.** Fishing period Sept 2017-Aug 2018, quotas, balances and transfer information for cod.

| Species | Cod | Haddock | Saithe | Redfish |
|---|---|---|---|---|
| Alloc. quota | 203,094 | 31,746 | 47,918 | 43,042 |
| Compensations | 2,204 | 664 | 1,695 | 2,277 |
| Trfr. prev. year | 8,289 | 4,312 | 7,016 | 3,322 |
| Allowed catch | 213,587 | 36,722 | 56,629 | 48,641 |
| Catch | 213,007 | 34,460 | 48,815 | 51,430 |
| Balance | 580 | 2,263 | 7,814 | -2,788 |
| Transfers | -13 | 1,041 | -1,553 | 5,031 |
| New balance | 567 | 3,304 | 6,261 | 2,243 |
| Trfr/ next year | 407 | 2,961 | 2,793 | 1,957 |
| Over fished | 2 | 0 | 0 | 0 |
| Net quota status | 162 | 343 | 3,468 | 286 |

| | |
|---|---|
| **References:** | As referenced/see footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.3.5.2. Clause 2.3.5.2.

Anyone purchasing and/or selling catches shall be obligated to present reports to the appropriate authorities, containing information on the purchase, sale and other disposition of fish catches. If analysis reveals discrepancy between the information stated in the reports and the information received from the harbour weighing, corrective measures shall be taken when this is deemed appropriate.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**All processors purchasing fish, be it directly or at auction, are obliged to submit monthly reports to the Directorate. In addition, the fish auction reports all sales of fish directly to the Directorate. Analysis of catches includes the comparison of reported catches with the amount of sold or exported products to verify independently that 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.**

**Evidence:**
All processors purchasing fish, be it directly or at auction, are obliged to submit monthly reports to the Directorate. In addition, the fish auction reports all sales of fish directly to the Directorate.

Export documentation provides an independent comparative check on catch quantities for different species. Analysis of catches includes the comparison of reported catches with the amount of sold or exported products to verify independently that landings aligned accurately with those reported[225]. If comparison reveals discrepancies in reported and actual landings received from quayside weighing by registered weighers corrective action is taken as appropriate.

| | |
|---|---|
| **References:** | As referenced/see footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[225] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Vidurlog

### 1.1.3.5.3. Clause 2.3.5.3.

There shall be full traceability from catch, through processing, export and delivery on the market.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Where required, there is full traceability from catch, through processing, export and delivery on the market is possible**.

**Evidence:**
There are effective systems in place to ensure the traceability of catch. The detailed spatial information available for each fishing trip means catch may be traced directly from when it was caught through subsequent processing, export and delivery to final market. Information relating to the provenance of the catch is communicated both to the Directorate's website and directly to the purchaser.

The official registration of landings contains a unique vessel identifier relating to the fishing vessel that landed the catch allowing traceability to individual vessels. In most cases, the unique vessel identifier remains with the batch throughout production and often on the final pack. For wet fish sales, from the auction, a vessel unique number is registered within the central e-auction for tracking purposes.

Full traceability is possible using all the tools within the system, however, not all buyers require full traceability from fishing vessel to the final product.

| | |
|---|---|
| **References:** | As referenced/see footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

# Section 3: Ecosystem Considerations

### 10.2.2. Clause 3.1. Guiding Principle

#### 10.2.2.1. Clause 3.1.1.

Adverse impacts of the fishery on the ecosystem shall be considered and appropriately assessed and effectively addressed[226], consistent with the precautionary approach[227].

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | **Medium ☑** | | High ☐ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | **Minor ☑** | None ☐ |

**Summary Evidence:**

**Since the Icelandic groundfish fishery of which cod is part of is multispecies in nature with vessels simultaneously targeting numerous species, habitat and bycatch effects are generally attributed to the fishery as a whole rather than to any species in particular. Most commercially fished species in Iceland, target or non target, are now part of the ITQ system and as such they are retained and accounted for within the catch accounting system operated by Fiskistofa. Discarding is prohibited. There are vulnerable and /or Endangered, Threatened and Protected (ETP) species occurring in Icelandic waters according to OSPAR.**
**E-logbooks recording of all marine mammals and seabirds catches (by species and numbers) is a legal requirement (Reg. 126/2014). A smartphone app is in development by the Directorate of Fisheries to make both reporting and identification of bycatch easier for operators in the fishery. Interactions between fishing gears and the seabed are highly dependent on gear type with towed bottom gears such as demersal trawls and dredges having a greater impact than static gear such as longlines, set nets or pots.**
**It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; coldwater corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Large areas within the Icelandic EEZ are closed, either temporarily or permanently, to fishing for a variety of reasons; these include the protection of juveniles, spawning fish and VMEs. Cumulatively, a large portion of Icelandic shelf area within which fishing activities occur is closed to bottom trawling.**

226 FAO Code of Conduct for Responsible Fisheries, Article 7.2.
227 In this context refer to 2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries, Article 3l: Adverse impacts of the fishery on the ecosystem should be appropriately addressed. Much greater scientific uncertainty is to be expected in assessing possible adverse ecosystem impacts of fisheries than in assessing the state of target stocks. This issue can be addressed by taking a "risk assessment/risk management approach". For the purpose of development of ecolabelling schemes, the most probable adverse impacts should be considered, taking into account available scientific information, and traditional, fisher or community knowledge provided that its validity can be objectively verified. Those impacts that are likely to have serious consequences should be addressed. This may take the form of an immediate management response or further analysis of the identified risk. ...

**EVIDENCE**

**Associated species catch and bycatch to the cod 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.

ICES reports that Icelandic cod catches from 2015/16 to 2017/18 have been caught in these proportions and with the following gears:

| Icelandic cod total catches[228] | | Bottom Trawl | Longline | Gillnet | Demersal seine | Handlines/jiggers |
|---|---|---|---|---|---|---|
| 2017/18 | 270,217 t | 51% [229] | 30% | 7% | 6% | 6% |
| 2016/17 | 237,644 t | 49% [230] | 32% | 7% | 6% | 6% |
| 2015/16 | 251,000 t | 45% [231] | 35% | 8% | 6% | 6% |
| **Average** | | **48.3%** | **32.3%** | **7.3%** | **6%** | **6%** |

Landed bycatch and associated species accounting for > 0.5% of the cumulative total for each of these gear types (i.e. bottom trawl, longline, gillnet, demersal seine and handlines) targeting and/or catching cod are shown in the tables below, compiled from catch data downloaded from the Directorate's website at http://www.fiskistofa.is/veidar/aflaupplysingar/bradabirgdatolur/.

The catches include ungutted weights of the species as well as cod catches from the Barents Sea (about 10,000 tonnes caught in the 2017-18 season with different gear types, about 3.5% of the overall cod catches)[232]. Also note that fishing vessels typically land gutted fish, but the quota allotted to the vessels is in terms of ungutted weight. The ungutted weight is derived from gutted weight by raising landings based on the species specific scalars listed in the Directorate website[233].

**Table 19.** Break down of landed bycatch and associated species (i.e. > 0.5% of the overall catch) in bottom trawl fisheries that targeted and caught cod in the 2017/18 season and the last 3 years average (2015/16, 2016/17 and 2017/18 seasons).

| Gear | Species | 2017/18 Total Catches (t) | 2017/18 catches % | Last 3 years average catches % |
|---|---|---|---|---|
| **Bottom Trawl** | Þorskur /cod | 142,639 | 47.24% | 46.96% |
| | Ufsi /saithe | 54,330 | 17.99% | 16.51% |
| | Karfi / Gullkarfi / Golden redfish | 47,314 | 15.67% | 17.28% |

[228] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf
[229] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf
[230] http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cod.27.5a.pdf
[231] http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cod.27.5a.pdf
[232] http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/?timabil=1718&fyrirsp=4&lang=en&landhelgi=U
[233] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/slaegingarstudlar/

| | | | | |
|---|---|---|---|---|
| | Ýsa /haddock | 23,701 | 7.85% | 7.28% |
| | Djúpkarfi / beaked redfish | 10,536 | 3.49% | 3.44% |
| | Grálúða / Greenland halibut | 8,716 | 2.89% | 3.27% |
| | Gulllax / greater silver smelt | 4,966 | 1.64% | 1.69% |
| | Skarkoli / plaice | 2,247 | 0.74% | 0.75% |
| | Steinbítur / Atlantic wolffish | 1,662 | 0.55% | 0.61% |
| | Langa / ling | 1,538 | 0.51% | 0.60% |

**Table 20**. Break down of landed bycatch and associated species (i.e. > 0.5% of the overall catch) in longline fisheries that targeted and caught cod in the 2017/18 season and the last 3 years average (2015/16, 2016/17 and 2017/18 seasons).

| Gear | Species | 2017/18 Total Catches (t) | 2017/18 catches % | Last 3 years average catches % |
|---|---|---|---|---|
| **Longline** | Þorskur /cod | 81,177 | 72.72% | 71.60% |
| | Ýsa /haddock | 14,391 | 12.89% | 13.10% |
| | Steinbítur / Atlantic wolffish | 5,588 | 5.01% | 4.67% |
| | Langa / ling | 4,384 | 3.93% | 4.41% |
| | Keila / tusk | 2,123 | 1.90% | 2% |
| | Karfi / Gullkarfi / Golden redfish | 1,208 | 1.08% | 1.17% |
| | Hlýri / spotted wolffish | 873 | 0.78% | 0.86% |
| | Ufsi /saithe | 653 | 0.58% | 0.66% |
| | Tindaskata / starry ray | 447 | 0.40% | 0.74% |

**Table 21.** Break down of landed bycatch and associated species (i.e. > 0.5% of the overall catch) in gillnet fisheries that targeted and caught cod in the 2017/18 season and the last 3 years average (2015/16, 2016/17 and 2017/18 seasons).

| Gear | Species | 2017/18 Total Catches (t) | 2017/18 catches % | Last 3 years average catches % |
|---|---|---|---|---|
| **Gillnet** | Þorskur /cod | 18960 | 89.02% | 81.65% |
| | Ufsi /saithe | 1318 | 5.58% | 7.41% |
| | Grálúða / Greenland halibut | 0 | 0% | *5.51% |
| | Langa / ling | 370 | 1.66% | 2.33% |
| | Ýsa /haddock | 313 | 1.43% | 1.28% |
| | Skarkoli / plaice | 182 | 0.84% | 0.75% |
| | Karfi / Gullkarfi / Golden redfish | 82 | 0.38% | 0.46% |

*Greenland halibut was only caught in the 2015/16 and 2016/17 seasons, none in the 2017/18 season.

**Table 22.** Break down of bycatch and associated species (i.e. > 0.5% of the overall catch) in demersal seine fisheries that targeted and caught cod in the 2017/18 season and the last 3 years average (2015/16, 2016/17 and 2017/18 seasons).

| Gear | Species | 2017/18 Total Catches (t) | 2017/18 catches % | Last 3 years average catches % |
|---|---|---|---|---|
| **Demersal Seine** | Þorskur /cod | 15715 | 48.39% | 50.54% |
| | Skarkoli / plaice | 5602 | 17.25% | 16.41% |
| | Ýsa /haddock | 4920 | 15.15% | 15% |
| | Steinbítur / Atlantic wolffish | 2145 | 6.60% | 5.09% |
| | Þykkvalúra / Sólkoli / lemon sole | 1197 | 3.69% | 3.58% |
| | Ufsi /saithe | 1047 | 3.22% | 3.14% |
| | Karfi / Gullkarfi / Golden redfish | 586 | 1.80% | 1.54% |
| | Langlúra / witch | 473 | 1.46% | 2.06% |
| | Sandkoli/dab | 392 | 1.21% | 1.14% |
| | Langa / ling | 172 | 0.53% | 0.66% |

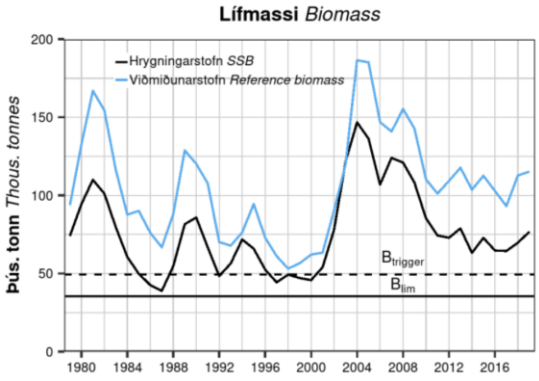
**Table 23.** Break down of bycatch and associated species (i.e. > 0.5% of the overall catch) in handline/jigger fisheries that targeted and caught cod in the 2017/18 season and the last 3 years average (2015/16, 2016/17 and 2017/18 seasons).

| Gear | Species | 2017/18 Total Catches (t) | 2017/18 catches % | Last 3 years average catches % |
|---|---|---|---|---|
| **Handline/ Jiggers** | Þorskur /cod | 15993 | 74.10% | 67.51% |
| | Makríll / mackerel | 4313 | 19.98% | 26.07% |
| | Ufsi /saithe | 1059 | 4.91% | 5.43% |
| | Karfi / Gullkarfi / Golden redfish | 122 | 0.57% | 0.6% |

**Status of bycatch and associated species in the cod target and non-target fisheries calculated from average catches (per relevant gear type) of the past three fishing seasons, as detailed above.**

**ÝSA – HADDOCK (*Melanogrammus aeglefinus*)[234]**

Figure from the June 2019 MFRI Advice:

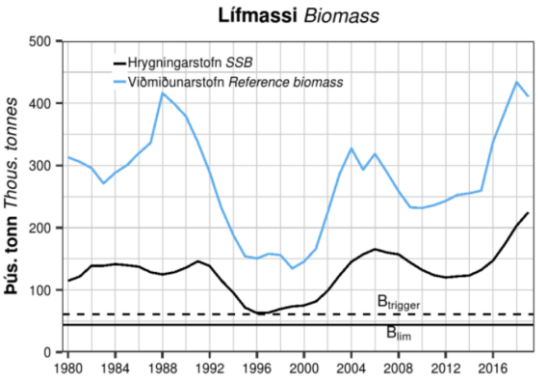


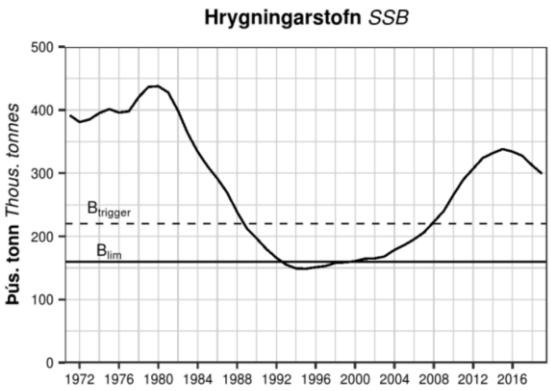

MFRI and ICES advised that when the Icelandic management plan is applied, catches in the fishing year 2019/2020 should be no more than 41 823 tonnes. The spawning-stock biomass (SSB) has decreased since 2008 but stabilized above MSY Btrigger in recent years. The harvest rate is currently estimated above HRMGT = HRMSY. Recruitment is highly variable and has increased since 2015. Reference biomass will increase in the next two years while the 2014 cohort remains in the fishery. The 2015–2017 cohorts are estimated close to the long-term mean recruitment and thus the stock is projected to

[234] https://www.hafogvatn.is/static/extras/images/02-Haddock%20(1)1141504.pdf

| | |
|---|---|
| | decrease. Average weight of the 2014–2017 year classes is predicted to be above average in 2019.<br><br>**The cod fishery does not appear to have any significant negative effects on this stock.** |

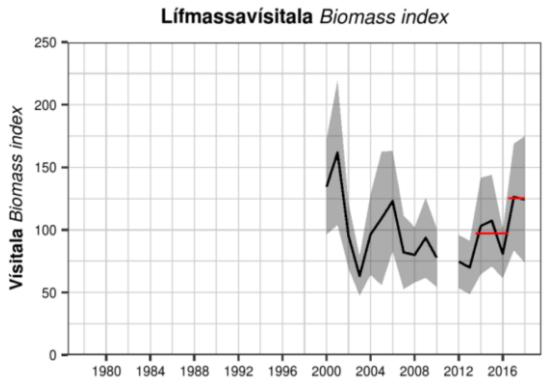
| **UFSI – SAITHE (*Pollachius virens*)[235]** | |
|---|---|
| Figure from the June 2019 MFRI Advice:<br>  <br> | MFRI and ICES advised that when the Icelandic management plan is applied, catches in the fishing year 2019/2020 should be no more than 80588 tonnes. The spawning-stock biomass (SSB) is currently at the time-series maximum. The harvest rate has declined from 2009 and is presently estimated below HRMGT. Recruitment in the last decade has been high. The reference biomass has increased since 2015 due to the large 2012 cohort and the cohorts from 2013 and 2014 are estimated to be above average. Stock size is not expected to change much in coming years.<br><br>**The cod fishery does not appear to have any significant negative effects on this stock.** |

| **GULLKARFI – GOLDEN REDFISH (*Sebastes norvegicus*)[236]** | |
|---|---|
| Figure from the June 2019 MFRI Advice:<br>  <br> | MFRI and ICES advise that when the management plan is applied, catches in the fishing year 2019/2020 in the East Greenland/Iceland/Faroe Islands area should be no more than 43568 tonnes. Spawning-stock biomass (SSB) steadily increased from 2002–2015 and then showed a decreasing trend but remains well above MSY Btrigger. Fishing mortality has decreased in the past two decades but is above FMSY. The 2009–2012 year classes are estimated to be record lows in the time series.<br><br>**The cod fishery does not appear to have any significant negative effects on this stock.** |

| **DJÚPKARFI – DEMERSAL BEAKED REDFISH (*Sebastes mentella*)[237]** | |
|---|---|
| Figure from the June 2019 MFRI Advice: | The fishery for Icelandic slope *S. mentella* in Icelandic waters is a directed bottom trawl fishery along the shelf and slope west, southwest, and southeast of Iceland at |

[235] https://www.hafogvatn.is/static/extras/images/03-Saithe%20(1)1141505.pdf
[236] https://www.hafogvatn.is/static/extras/images/05-GoldenRedfish%20(1)1141506.pdf
[237] https://www.hafogvatn.is/static/extras/images/61-DemersalSmentella%20(1)1141508.pdf




TAC and catches:

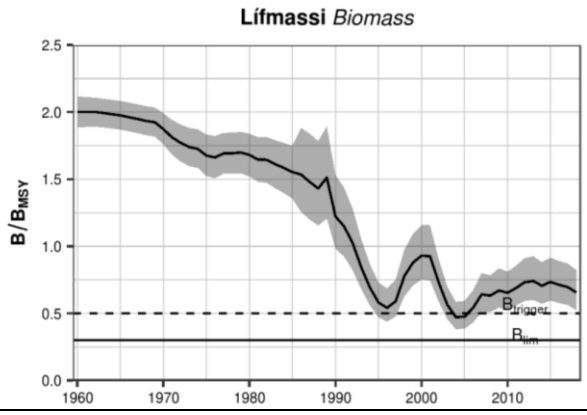
| Fiskveiðiár *Fishing year* | Tillaga *Recommended TAC* | Aflamark *National TAC* | Afli *Catches* |
|---|---|---|---|
| 2010/11 | 10000 | 12500 | 12085 |
| 2011/12 | 10000 | 12000 | 12321 |
| 2012/13 | 10000 | 10000 | 10396 |
| 2013/14 | 10000 | 10000 | 9753 |
| 2014/15 | 10000 | 10000 | 9037 |
| 2015/16 | 10000 | 10000 | 9599 |
| 2016/17 | 12922 | 12922 | 8556 |
| 2017/18 | 11786 | 11786 | 10540 |
| 2018/19 | 13012 | 13012 | |
| 2019/20 | 12492 | | |

depths between 500 and 800 m. MFRI and ICES advised that when the precautionary approach is applied, catches in the fishing year 2019/2020 should be no more than 12492 tonnes. The IS-SMH biomass index shows an increasing trend after 2013. Since 2007, survey estimates have consistently shown very low estimates for juveniles (≤30 cm). The ICES framework for category 3 stocks was applied (ICES, 2012). The IS-SMH survey index was used as an indicator of stock development. The advice is based on comparing the mean of the two latest index values (index A) with the mean of the three preceding values (index B), combined with the catch advice for 2019. The index is estimated to have increased by 27.9% (more than 20%), thus the uncertainty cap was applied. The precautionary buffer was applied in 2017 and was applied again this year due to a lack of incoming recruitment. Catches in Iceland in the past 5 years have been within TAC levels.

**The cod fishery does not appear to have any significant negative effects on this stock.**

**GRÁLÚÐA – GREENLAND HALIBUT *(Reinhardtius hippoglossoides)*[238]**

Figure from the June 2019 MFRI Advice:




MFRI and ICES advised that when the MSY approach is applied, catches in the 2019/2020 fishing year should be no more than 21360 tonnes. According to an agreement between Iceland and Greenland, 56.4% of the TAC is allocated to Iceland. The stock biomass is stable and is above MSY Btrigger. Fishing mortality is estimated to be above FMSY.

**The cod fishery does not appear to have any significant negative effects on this stock.**

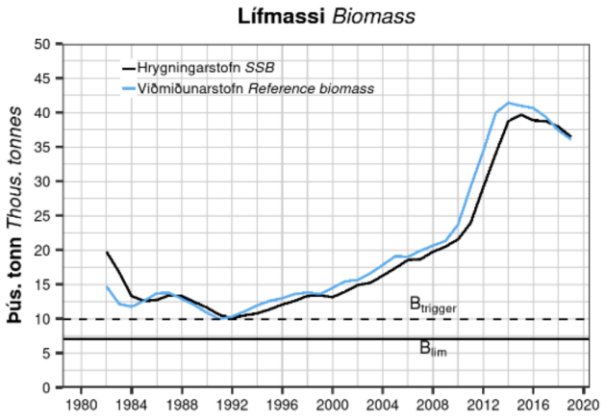
**LANGA – LING (*Molva molva*)[239]**

Figure from the June 2019 FRMI Advice:

MFRI and ICES advise that when the Icelandic management plan is applied, catches in the fishing year 2019/2020 should be no more than 6599 tonnes. The spawning-stock biomass (SSB) and the reference

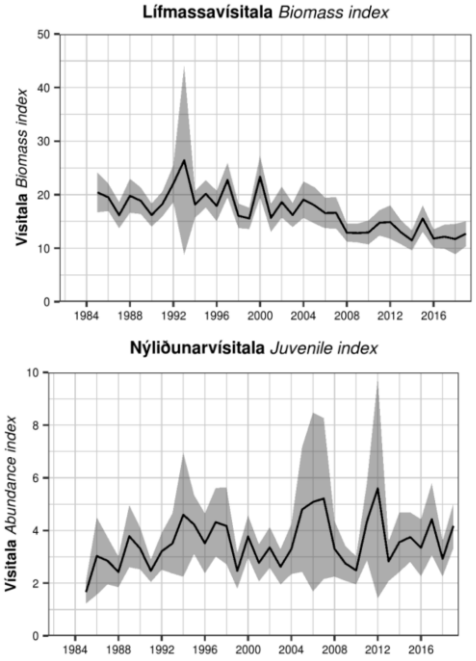
[238] https://www.hafogvatn.is/static/extras/images/22-GreenlandHalibut%20(1)1141512.pdf
[239] https://www.hafogvatn.is/static/extras/images/06-Ling1141517.pdf




biomass (ling >75 cm) in 2018 are among the highest in the time series. Harvest rate (HR) has decreased since 2008 and is now the lowest in the time series, but above HRMGT. Recruitment was high from 2004 to 2011 but has declined to the levels of the 1980s and 1990s.

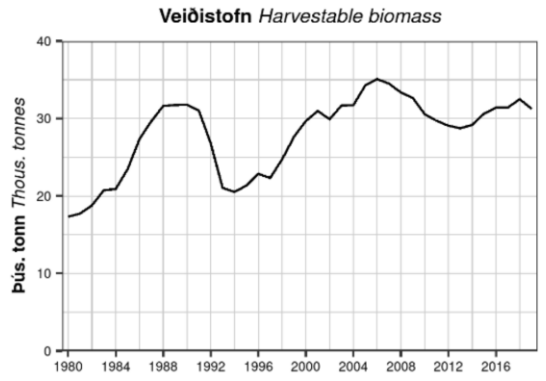
**The cod fishery does not appear to have any significant negative effects on this stock.**

| **TINDASKATA – STARRY RAY (*Amblyraja radiate*)[240]** | |
|---|---|
| Figure from the June 2019 MFRI Advice:   | MFRI does not recommend a TAC for the 2019/2020 fishing year. The survey biomass index (IS-SMB) shows a long term decreasing trend. Since 2008, the biomass index has been stable but at the lowest level in the time series. The abundance index of juveniles (<21 cm) appears to be stable, despite large variations.<br><br>**The cod fishery does not appear to have any significant negative effects on this stock.** |

| **STEINBÍTUR–ATLANTIC WOLFFISH (*Anarhichas lupus*)[241]** | |
|---|---|
| Figure from the June 2019 MFRI Advice: | MFRI advises that when the MSY approach is applied, catches in the fishing year 2019/2020 should be no more than 8344 tonnes. MFRI recommends a continued closure of the spawning area west of Iceland during the spawning and incubation season in autumn and winter. Harvestable biomass declined from 2006–2013 but has increased since |

[240] https://www.hafogvatn.is/static/extras/images/12-StarryRay1141533.pdf
[241] https://www.hafogvatn.is/static/extras/images/09-AtlanticWolffish%20(1)1141514.pdf

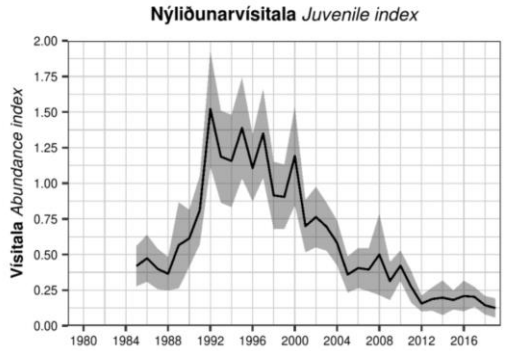


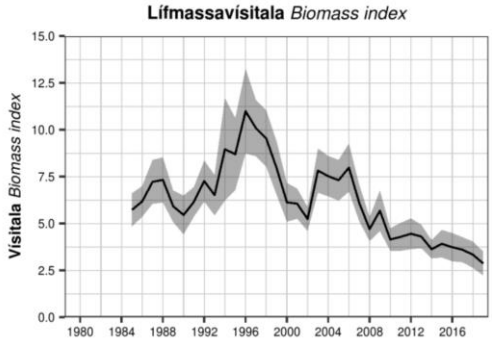

then and is now close to the highest level in the assessment history. Fishing mortality has been below or close to FMSY since 2014. Recruitment has been low since 2006, as compared to the two preceding decades.

**The cod fishery does not appear to have any significant negative effects on this stock.**

## HLÝRI – SPOTTED WOLFFISH (*Anarhichas minor*)[242]

Figures from the June 2019 MFRI Advice:




Around 98% of Spotted wolffish (*Anarhichas minor*) is currently caught as bycatch in the trawl and longline fisheries that target cod and is mainly found at the northwest and north parts of the continental shelf of Iceland, at sandy or muddy substrate and depths of 100-400 meters, in fishing ground overlapping with those of cod. From 2002, the catch on longline has been increasing relative to that taken in demersal trawl. In 2018, longline catch was around 53% of the total catch.

Since 2012 catches have been consistently above advice/recommended TAC. Spotted wolffish was included in the ITQ system in 2018 and the TAC in 2018/2019 was set as per recommended TAC of 1001 t[2]. Preliminary catches in 2018/19 have exceeded the TAC (1200 t caught by August 7th 2019) based on Fiskistofa records[3]. We note, these values may be subject to revision.

| Year | Advice/ Recommended TAC | National TAC | Spotted Wolffish Catches | Total catches as a % of advice |
|---|---|---|---|---|
| 12/13 | 900 | | 2,042 | 227% |
| 13/14 | 900 | | 2,250 | 250% |
| 14/15 | 900 | | 1,655 | 184% |
| 15/16 | 900 | | 1,913 | 213% |
| 16/17 | 1128 | | 1,587 | 141% |
| 17/18 | 1080 | | 1,528 | 141% |
| 18/19 | 1001 | 1,001 | 1,234 | 123% |
| 19/20 | 375 | 375 | | |

[242] https://www.hafogvatn.is/static/extras/images/13-SpottedWolffish%20(1)1141515.pdf
[2] https://www.hafogvatn.is/static/extras/images/13-SpottedWolffish_TR1141496.pdf
[3] http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/


In a request for clarification, the Ministry confirmed that spotted wolffish is caught with other species in the mixed fishery and is therefore very difficult to manage. They also explained that in the fishing year (2019/2020) the TAC is extremely small so there might be additional difficulties in maintaining the species within TAC.

In their 2019 Advice, MFRI advised that when the precautionary approach is applied, catches in the fishing year 2019/2020 should be no more than 375 tonnes. Biomass and juvenile indices are at their lowest levels in the time series. Fproxy has been high since 2000.

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

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

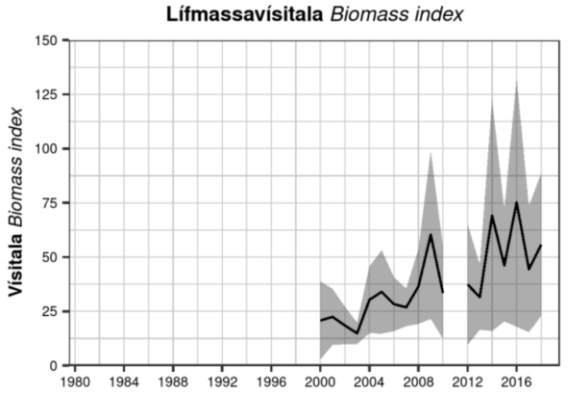
It is not clear to what degree management has been successful at reducing harvest for this stock since catches in 2018/19 appear to have exceeded the TAC by over 20%. The same or perhaps a bigger issue remains for the reduced 2019/2020 quota and the related effects on the stock. **The cod fishery overlaps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

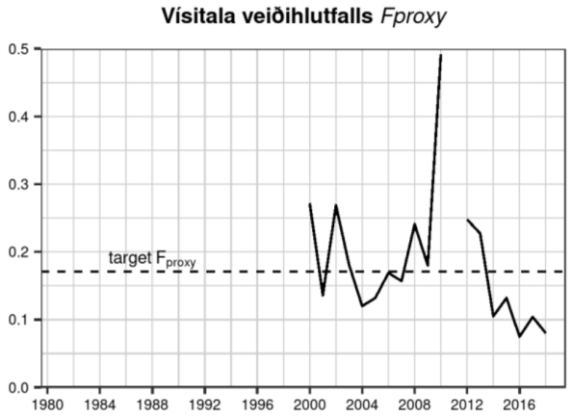
| **GULLLAX – GREATER SILVER SMELT (*Argentina silus*)[243]** | |
|---|---|
| Figure from the June 2019 MFRI Advice: | MFRI and ICES advise that when the precautionary approach is applied, catches in the fishing year 2019/2020 |

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

243 https://www.hafogvatn.is/static/extras/images/19-GreaterSilverSmelt1141531.pdf



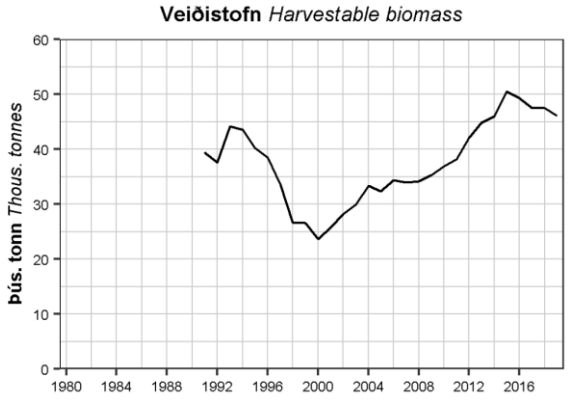




should be no more than 9124 tonnes. The survey index has been high since 2014 but has fluctuated greatly. The Fproxy has decreased since 2010 and has been below the target Fproxy since 2014.

**The cod fishery does not appear to have any significant negative effects on this stock.**

**SKARKOLI – PLAICE (*Pleuronectes platessa*)[244]**

Figure from the June 2019 MFRI Advice:




MFRI advises that when the MSY approach is applied, catches in the fishing year 2019/2020 should be no more than 6985 tonnes. In addition, the MFRI recommends that regulations regarding area closures on spawning grounds remain in effect. The harvestable biomass steadily increased from 2000–2015 and then showed a slightly decreasing trend. Fishing mortality has declined since 1997 and has been around FMSY since 2011. Recruitment has been stable since 1994.

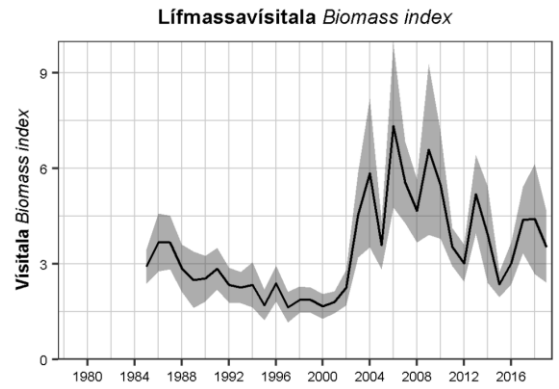
**The cod fishery does not appear to have any significant negative effects on this stock.**

**ÞYKKVALÚRA – LEMON SOLE (*Microstomus kitt*)[245]**

Figure from the June 2019 MFRI Advice:

[244] https://www.hafogvatn.is/static/extras/images/23-Plaice%20(1)1141499.pdf
[245] https://www.hafogvatn.is/static/extras/images/24-LemonSole%20(1)1141520.pdf

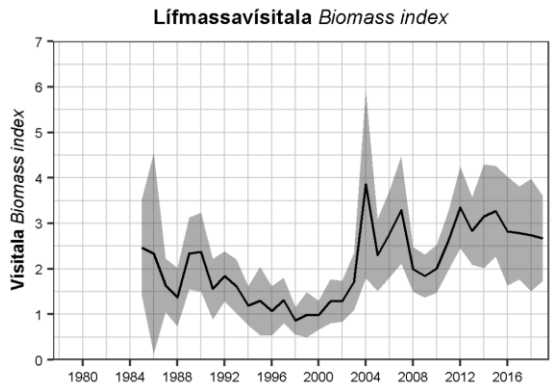



MFRI advises that when the precautionary approach is applied, catches in the fishing year 2019/2020 should be no more than 1341 tonnes. The IS-SMB biomass index has been relatively high but variable since 2003 compared to the period 1992–2002. Fproxy has been highly variable for two decades. IS-SMB recruitment index has been high since 2002, and it is therefore likely that the stock biomass will remain stable or increase.

**The cod fishery does not appear to have any significant negative effects on this stock.**

**LANGLÚRA – *WITCH (Glyptocephalus cynoglossus)*[246]**

Figure from the June 2019 MFRI Advice:

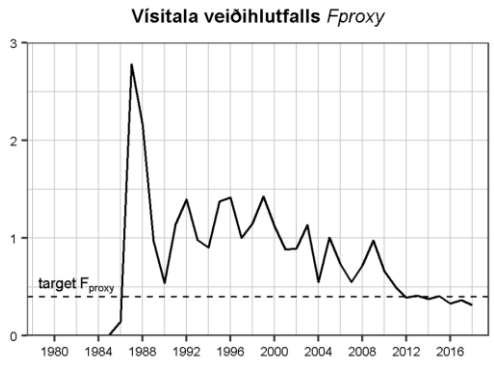



MFRI advises that when the precautionary approach is applied, catches in the 2019/2020 fishing year should be no more than 1067 tonnes. IS-SMB biomass index has been high since 2004. The recruitment index has, however, declined since 2009, and reached an all-time low in 2015–2019. Low recruitment in recent years might lead to a decline in the stock in the near future. Fproxy has remained relatively low and stable over the last seven years.

**The cod fishery does not appear to have any significant negative effects on this stock.**

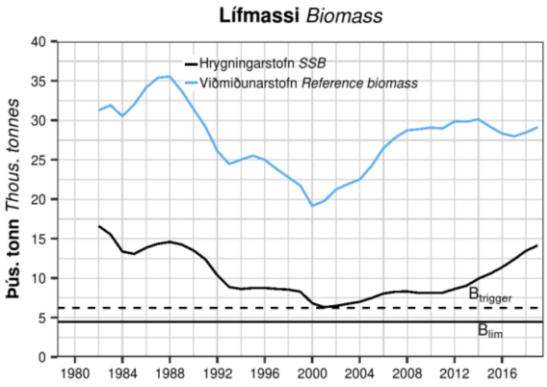
[246] https://www.hafogvatn.is/static/extras/images/25-Witch%20(1)1141521.pdf




**KEILA – TUSK (*Brosme brosme*)[247]**

Figure from the June 2019 MFRI Advice:

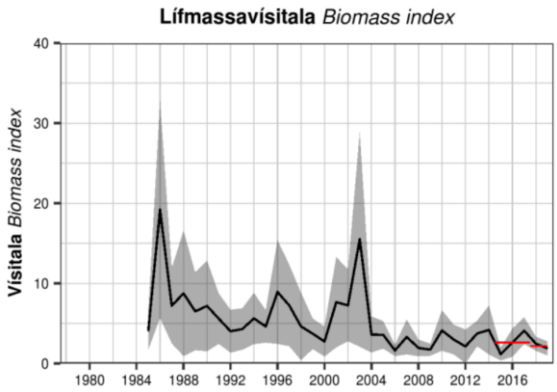



MFRI and ICES advise that when the Icelandic management plan is applied, catches in the fishing year 2019/2020 should be no more than 3856 tonnes. In addition, continued closure of the nursery areas off the southeast and southern coast should be maintained. SSB has increased in recent years while the reference biomass (tusk ≥40 cm) has declined but remains at a high level. Harvest rate has declined in recent years and is close to HRMGT. Recruitment in 2012–2015 was low, but has increased since then.

**The cod fishery does not appear to have any significant negative effects on this stock.**

**SANDKOLI – DAB (*Limanda limanda*)[248]**

Figure from the June 2019 MFRI Advice:




MFRI recommends a TAC no higher than 399 tonnes for the 2019/2020 fishing year. The MFRI also recommends that the defined quota area from Snæfellsnes to Stokksnes will be abolished, and all dab fishing grounds be under TAC limits. IS-SMB biomass index has remained low since 2004, as compared to the years 1985–2003. Catches have been within national TAC limits in the past few years.

**The cod fishery does not appear to have any significant negative effects on this stock.**

[247] https://www.hafogvatn.is/static/extras/images/08-Tusk1141519.pdf
[248] https://www.hafogvatn.is/static/extras/images/27-Dab%20(1)1141501.pdf

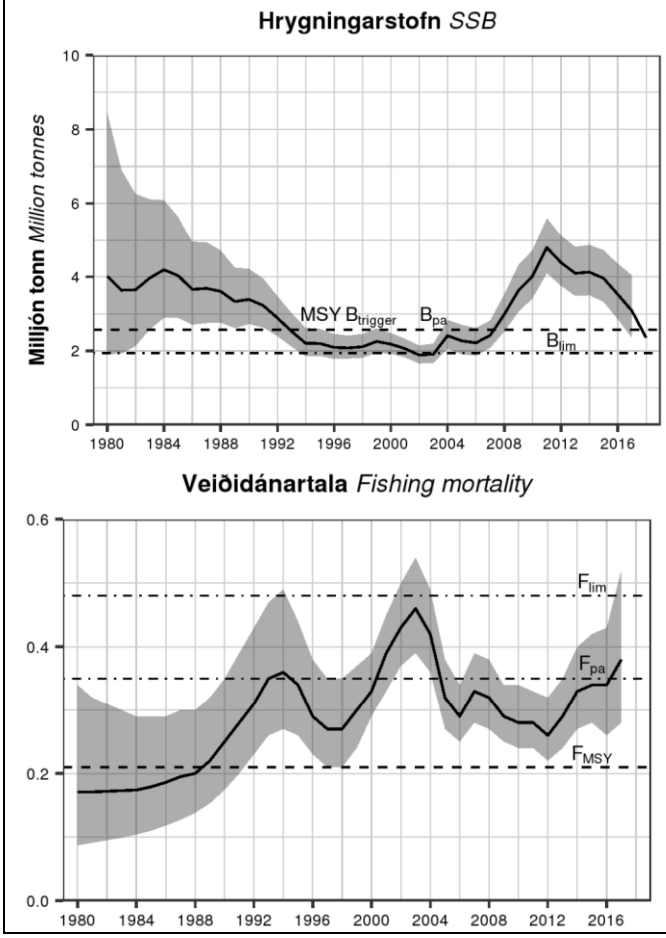
  

***Dab.*** *Recommended TAC, national TAC, catch in the quota area, and total catches (tonnes).*

| Fiskveiðiár *Fishing year* | Tillaga *Rec. TAC* | Aflamark *National TAC* | Afli aflamarkssvæði *Catch quota area* | Afli alls *Total catch* |
|---|---|---|---|---|
| 2010/11 | 500[1)] | 900 | 596 | 814 |
| 2011/12 | 500[1)] | 900 | 711 | 890 |
| 2012/13 | 500[1)] | 800 | 587 | 781 |
| 2013/14 | 500[1)] | 500 | 403 | 594 |
| 2014/15 | 1000 | 1000 | 334 | 546 |
| 2015/16 | 500 | 500 | 334 | 443 |
| 2016/17 | 500 | 500 | 181 | 206 |
| 2017/18 | 500 | 500 | 297 | 399 |
| 2018/19 | 500 | 500 | | |
| 2019/20 | 399 | | | |

## MAKRÍLL – MACKEREL (*Scomber scombrus*)[249]

Figure from the June 2019 MFRI Advice:




Icelandic catches of mackerel in 2017 were 167 367 tonnes. Most of the catches was caught in pelagic trawl (97%) but 3% were caught by jiggers. ICES advises that when the MSY approach is applied, catches in 2019 should be no more than 318 403 tonnes. The spawning-stock biomass (SSB) is estimated to have increased in the late 2000s to reach a maximum in 2011 and has been declining since then. The stock is estimated to be below MSY Btrigger in 2018, for the first time since 2007. The fishing mortality (F) has declined from high levels in the mid-2000s, but increased again after 2012, and remains above FMSY. There has been a succession of large year classes since the early 2000s, but the 2015 and 2016 year classes are estimated to be below average.

**The cod fishery does not appear to have any significant negative effects on this stock.**

[249] https://www.hafogvatn.is/static/extras/images/Makrill1097054.pdf

**Vulnerable and ETP species Interactions**

Further to the Icelandic cod fishery associated catches and bycatch listed above, there are other vulnerable and /or ETP species occurring in Icelandic waters according to the Convention for the Protection of the Marine Environment of the North-East Atlantic or OSPAR Convention, as reported in the 2018 ICES Ecosystem report of the Icelandic Ecoregion[250] and shown below.

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| SEABIRDS | |
| *Rissa tridactyla* | Black-legged kittiwake |
| *Uria lomvia* | Thick-billed murre (or Brünnich's guillemot) |
| FISH | |
| *Anguilla anguilla* | European eel |
| *Centrophorus squamosus* | Leafscale gulper shark |
| *Cetorhinus maximus* | Basking shark |
| *Dipturus batis* | Common skate |
| *Hoplosthethus atlanticus* | Orange roughy |
| *Lamna nasus* | Porbeagle |
| *Petromyzon marinus* | Sea lamprey |
| *Salmo salar* | Salmon |
| *Squalus acanthias* | [Northeast Atlantic] spurdog |
| MARINE MAMMALS | |
| *Balaenoptera musculus* | Blue whale |
| *Eubalaena glacialis* | Northern right whale |

OSPAR Contracting Parties are Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom, and the European Union.

The table below provides catch information for species mentioned in the OSPAR table which have relevance to the Icelandic fisheries. Further below there is additional information about some of these species.

**Table 24.** Icelandic landings in tonnes of common skate (*Dipturus batis*), Atlantic halibut (*Hippoglossus hippoglossus*), orange roughy (*Hoplosthethus atlanticus*) spiny dogfish (*Squalus acanthias* also known as spurdog), Greenland shark (*Somniosus microcephalus*) and Porbeagle shark (*Lamna nasus*) 2006 – 2017. Data downloaded from the Fiskistofa[251] website, on August 8th, 2019.

| Species catches (t) per year | 2006/ 07 | 2007/ 08 | 2008/ 09 | 2009/ 10 | 2010/ 11 | 2011/ 12 | 2012/ 13 | 2013/ 14 | 2014/ 15 | 2015/ 16 | 2016/ 17 | 2017/ 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common skate | 136 | 123 | 127 | 128 | 117 | 125 | 145 | 153 | 141 | 157 | 132 | 139 |

250 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/IcelandicWatersEcoregion_EcosystemOverview.pdf

251 http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atlantic halibut | 559 | 516 | 529 | 548 | 557 | 555 | 36 | 39 | 45 | 87 | 123 | 137 |
| Orange roughy | 0.9 | 3.7 | 0.1 | 1 | 1.5 | 19 | 56 | 13 | 6 | 5.8 | 36.6 | 18.9 |
| Spiny dogfish | 82 | 43 | 68 | 102 | 62 | 53 | 51 | 6 | 19 | 8 | 8 | 2 |
| Greenland shark | 28 | 2 | 35 | 26 | 43 | 18 | 19 | 6 | 26 | 18 | 26 | 10 |
| Porbeagle shark | 0.4 | 0.4 | 1.1 | 1 | 1.1 | 1 | 0.8 | 0.9 | 0.4 | 0.8 | 1.1 | 1.2 |

**Common skate (Grey skate)**

Recent studies have shown that the common skate in the Northeast Atlantic may actually be one of two nominal species; the smaller blue skate or grey skate (*Dipturus flossada*) and the large flapper skate (*Dipturus intermedia*); together they are more commonly referred to as the *D. batis* (listed as Critically Endangered under the IUCN Red list[252], last assessed in 2006) species-complex (Iglésias, 2009)[253]. Investigation of skates in Icelandic waters have shown that the skate currently found in Icelandic waters, and caught as bycatch in Icelandic fisheries, is the smaller grey skate (*D. flossada*) (Jonbjorn Pálsson, unpublished material) with the larger sister species, the flapper skate (*D. intermedia*), believed to be almost extinct in the Atlantic.

A taxonomic revision of these species has concluded that the smaller-bodied blue skate should retain the scientific name *Dipturus batis* and the larger-bodied flapper skate is now referred to as *Dipturus intermedius* (Last et al., 2016). FAO have accepted the latter name, assigning it the ASFIS code DRJ. Flapper skate is reported predominantly from the northern North Sea and north-west Scotland and is occasionally found in the Celtic Sea. The smaller blue skate is reported predominantly in the Celtic Sea, and its distribution extends northwards to Iceland. The southern limits of both species are uncertain[254].

The grey/blue skate used to be fairly common in Icelandic waters but has been overfished and catches are now only about 10% of what they were 50 years ago. Total catch of skate in Icelandic waters in 2017/18 was 139 tonnes, very close to the 10 years average.

No TAC is available for this species because there is no directed fishery for it. It is caught as bycatch in mainly longline, bottom trawl and Danish seine gear. More than half of the catches are taken in longline fisheries, and about 20% are taken by bottom trawl gear as shown below.

[252] https://www.iucnredlist.org/species/39397/10198950#assessment-information
[253] https://onlinelibrary.wiley.com/doi/abs/10.1002/aqc.1083
[254] http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/rjb.27.89a.pdf

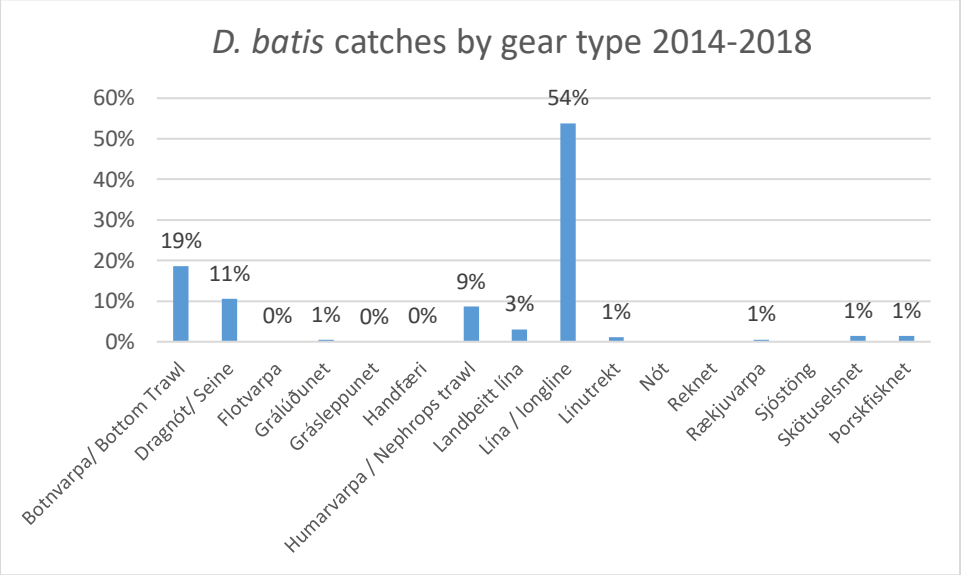



**Figure 52.** D. batis bycatch by gear type, 2014-2018 average.

MFRI will continue to report on incidences of capture and distribution of skate during the spring bottom trawl survey as they have been doing since the survey began in 1985. In addition, catches in commercial fisheries will continue to be collected and the MFRI will monitor whether significant changes either the survey results or the level of landed catches occur. Misidentification of species is considered an issue and can lead to some moderate errors in landings data.

Indices of abundance are uncertain as only limited survey data exists. Recent survey trends in Icelandic waters indicate some increase in the scientific groundfish survey (Figure below).

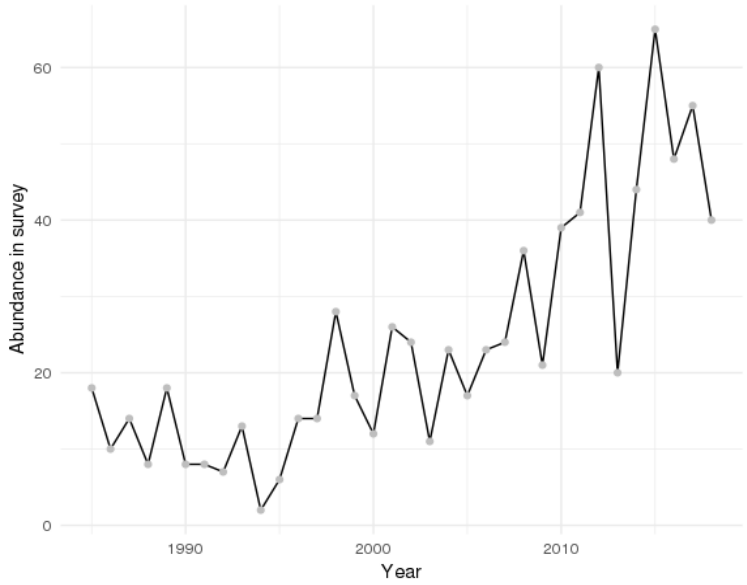



**Figure 53.** Total catch in numbers of Grey skate (Dipturus flossada/batis) in MFRI spring survey (1985 – 2018) (Source: MFRI data provided to assessment team during Nov. 2018 site visits).

**Dipturus spp. abundance in EU Waters**

There are currently no robust indicators of stock size for blue skate and flapper skate in EU waters[255]. The Spanish Porcupine Bank survey (SpPGFS-WIBTS-Q4) has seen increasing catch rates of Dipturus spp. (ICES, 2018). However, this survey may not be representative of the whole stock area.

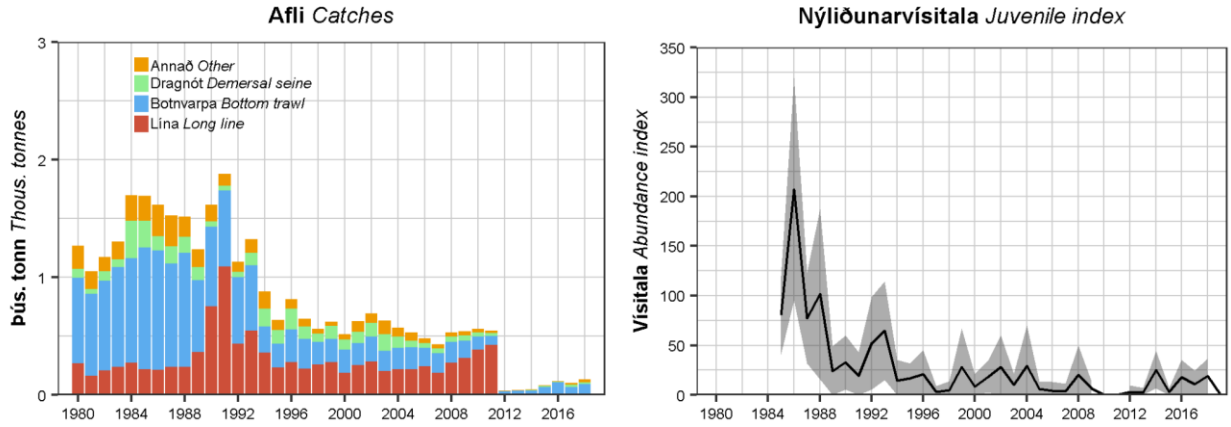
The UK southwestern beam trawl survey (UK-Q1-SWBeam) caught immature blue skate, with preliminary studies indicating an increasing trend in Division 7.e (ICES, 2018). These and other surveys in the Celtic Seas may provide a stock size indicator in the future.

**Atlantic halibut (*Hippoglossus hippoglossus*)**

Atlantic halibut is classified as Endangered on the IUCN Red list but has been last assessed globally in 1996[256]. Around 2000 tonnes of Atlantic halibut were landed annually from Icelandic waters in 1984–1991, but the catch declined to 500–800 tonnes in 1997–2011. Atlantic halibut is now only caught as bycatch in bottom gear all around the island.

Annual landings of Atlantic halibut were 36–119 tonnes in 2012–2017, which are the lowest landings since the beginning of the fishery. The decrease is due to management decisions. The IS-SMB only covers the fishing grounds of juvenile Atlantic halibut, and there is a lack of information on the adult population. The survey indices have been relatively stable between years, and uncertainties around them are low. A committee established in 2010 by the minister of fisheries due to the poor state of the Atlantic halibut stock, concluded that the most effective way to rebuild the stock would be to ban all targeted fishing.

The Marine Research Institute followed up on these conclusions, by consulting with experienced captains on what would be the best course of action to protect the stock, resulting in advice to ban targeted fishing, and to make it mandatory to release all viable Atlantic halibut caught as bycatch in other fisheries. In 2012, a regulation was issued to ban all targeted fishing for Atlantic halibut[257] and stipulating that all viable halibut in other fisheries must be released. In 2019, MFRI's advice is that these regulations remain in effect[258].




[255] http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/rjb.27.67a-ce-k.pdf
[256] https://www.iucnredlist.org/species/10097/3162182
[257] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302
[258] https://www.hafogvatn.is/static/extras/images/21-AtlanticHalibut1141466.pdf

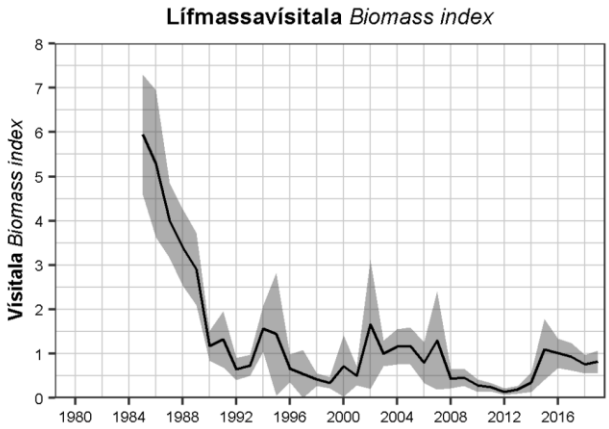



**Figure 54.** Catch by gear type, IS-SMB juvenile (<30 cm) and biomass (≥20 cm) indices.

**Orange roughy (*Hoplostethus atlanticus*)**

Recent catches of orange roughy in Iceland have been quite small recently, and have been 18.9 tonnes in 2017-18. Orange roughy is considered Vulnerable under the IUCN red list as assessed last in 2014[259]. During the November 2018 on-site visits, the MFRI stated that there is limited overlap between bottom trawl fisheries and the orange roughy stock because it occurs in deeper water than other species.

**Ban on fishing for spiny dogfish, Porbeagle sharks and Basking shark**

Regulation 456/2017 states that there is a ban on fishing for Porbeagle sharks, Basking shark and spiny dogfish. Any incidental catches of these species are to be landed and sold on an approved auction market for marine products according to the provisions of Act no. 37/1992, on a special fee for illegal fishing, with subsequent amendments. [260] This is the same mechanism adopted (i.e. VS catches) for Atlantic halibut catches, for which directed fishing is banned. During the 2018 November site visits, the Assessment Team visited the Fish Auction in Reykjavik. One Atlantic halibut was in temporary store there. The director of the fish auction confirmed that catches of banned species are sold and 80% of the value goes to a MFRI research fund and only 20% to the fishermen. These VS catches measures are meant to facilitate the landing of every species, discourage potential targeting and avoid discarding.

During the November 2018 site visits, the MFRI also reported that few basking sharks have been reported historically as bycatch in logbooks, so some interactions have been documented in the past. They seem however to be very rare and far between. Leafscale gulper sharks are usually only found in waters deeper than fisheries for cod, haddock, saithe and redfish operate in.

**Spiny dogfish / spurdog (*Squalus acanthias*)**

When foreign fleets operated in Iceland, hundreds of tonnes of spiny dogfishes were fished annually. However, Icelandic catches have always been low, less than 10 tonnes, in recent years. Catches in 2015, 2016, and 2017 were 8, 8 and 2 tonnes, respectively.

[259] https://www.iucnredlist.org/species/155168/45884209
[260] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017

*Squalus acanthias* is currently listed as Vulnerable under the IUCN red list as last assessed in 2016[261]. As spiny dogfish are an aggregating species, landings can be dominated by relatively few large hauls leading to large fluctuations in annual landings and/or survey results. As explained above, there is a ban on spiny dogfish in Iceland and current catches are solely bycatch in other fisheries, primarily gillnet fisheries off the southern coast during the summer months. Recent catches of spiny dogfish appear to be very small.

**Porbeagle shark (*Lamna nasus*)**

*Lamna nasus* is currently listed as Critically Endangered in Europe under the IUCN red list as last assessed in 2015[262]. Recorded catches of Porbeagle shark in Iceland are very small (in the region of 1 tonne or less a year in the past 10 years) and unlikely to negatively affect the stock. There is a ban on fishing Porbeagle shark in Iceland.

**Greenland shark (*Somniosus microcephalus)***

*Somniosus microcephalus* is considered near threatened under the IUCN Red list as last assessed in 2006[263]. Historically, Greenland sharks were fished in Icelandic waters with the fishery reaching its peak in 1867 when 13,100 barrels of shark oil were exported. Later, whale and then fuel oil became more available and commercial fisheries for Greenland shark ceased by about 1910. Greenland sharks are still targeted in small scale artisanal fisheries and is a periodic bycatch in bottom trawl fisheries[264]. National landings in 2017/2018 totalled 10 t with no specific changes or trends apparent in the annual landings[265].

**Blue Whale**

The blue whale is recognised in the OSAPR list as one of the threatened and declining species in the Icelandic Waters ecoregion. The 2018 NAMMCO progress report for Iceland[266] reported that the Húsavík Research Centre (HRC) in Húsavík continued their long-term photo-identification and sightings studies of blue whales in Skjálfandi bay. Acoustic tags were deployed on two blue whales in Skjálfandi Bay and playbacks with low frequency sounds to blue whales. Two more fin/blue whale hybrids were genetically confirmed by the MFRI.

**North Atlantic Right Whale**

No specific monitoring information is available for this species. Sightings of this species are very rare in Iceland and most of the living population is thought to reside in Eastern US and Canada coast[267]. No interactions between Blue whales and Northern right whales have been recorded in recent years with Icelandic fisheries. This was confirmed during the November 2018 site visits by the MFRI.

**E-logbook seabird and marine mammals recording**

The electronic logbook system designed by TrackWell allows for marine mammal and seabirds to be recorded along with normal catch. In total there are 171 marine mammal and seabird species pre-programmed into the

[261] https://www.iucnredlist.org/species/91209505/2898271
[262] https://www.iucnredlist.org/species/11200/48916453#geographic-range
[263] https://www.iucnredlist.org/species/60213/12321694
[264] https://seaiceland.is/what/fish/sharks-and-skates/greenland-shark
[265] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGEF/26%20WGEF%20Report%202018_Section%2024%20Greenland%20shark_NEA.pdf
[266] https://nammco.no/wp-content/uploads/2019/04/2018-iceland_progress_report_final2.pdf
[267] https://www.cbc.ca/news/canada/nova-scotia/mogul-north-atlantic-right-whale-travelling-wanderlust-france-1.5200318

e-log system that are selectable by fishers. Recording of all marine mammals and seabirds in E-logbooks (by species and numbers) catches is a legal requirement (Reg. 126/2014)[268].

**E-logbook app modifications**

A smartphone app is in development by the Directorate of Fisheries, to make both reporting and identification of bycatch easier for operators in the fishery. During the 2018 site visits the Directorate reported that this app prioritises the need for recording marine mammals and seabirds interactions/bycatch before fish catches are submitted, to enable more consistent and reliable reporting. The app appears to be ready for implementation but there is a need to change current legislation to ensure it can be nested within legal requirements. The Assessment Team will review on this development in the next audit.

**Quality of marine mammals and seabird interaction data collected by Directorate inspectors**

In relation to the quality of by-catch data, it is important to note that the Directorate's inspector coverage of all gear types is limited, and that the sampling is not focused on documenting seabird and marine mammal by-catch (see coverage information below). In 2018, Directorate's Inspectors registered the bycatch 259 marine mammals and birds during their work on board of fishing vessels (2018 Fiskistofa Monitoring Report, part of the Annual Report)[269]. The Directorate has placed extra effort in monitoring gillnet fisheries for lumpfish and for cod in 2017/2018 due to bycatch issues. All trips are unannounced.

**Table 25.** Unannounced inspector days on fishing vessels in the past 3 years.

| Season | Fishery type: Bottom Trawl | Fishery type: Longline | Fishery type: Gillnet (include lumpfish and cod) |
|---|---|---|---|
| 2015/16 season days | 553 | NA (likely but not reported) | 81 (60 days cod, 21 days lumpsucker)[270] |
| 2016/17 season days | 780 | 230 | 117 (60 days cod, 57 lumpsucker)[271] |
| 2017/2018 season days | 570 | 202 | 152 |
| 2017/2018 season coverage | 1.93% | 0.64% | 3.64% |

As mentioned above, most attention is given to seabird and marine mammal by-catch in the gillnet fisheries, where most of the by-catch is assumed to occur. Less information is available from other fishing gears. It is also important to note that even where Directorate's inspectors are present they are not always in a position to document any bycatch. For instance, in the pelagic pair trawl fishery, inspectors are below deck to monitor the catch, and not in a position to see if a seabird or marine mammal is caught[272].

[268] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967
[269] http://www.fiskistofa.is/media/arsskyrslur/5_Fiskistofa-15.-april-2019_Eftirlit.pdf
[270] http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WGBYC/wgbyc_2017.pdf
[271] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf
[272] Report of the NAMMCO Scientific Committee Working Group on By-catch, 2 - 4 May 2017, Faroes Representation Copenhagen, Denmark. https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf

Since 2014, inspection and recording improved with stricter guidelines regarding marine mammal by-catch and supervision of the inspectors. Prior to this the inspectors data on marine mammal by-catch is not considered reliable.

The next section provides sources of data post 2014, when the requirement for recording seabird and marine mammal bycatch went into force, showing available observed and raised (i.e. calculated at fleet level) bycatch data for both marine mammals and seabirds in various fisheries before providing a status evaluation for affected species.

**2015 data on marine mammals and seabirds from various fisheries (gillnet, demersal trawl)[273]**
Monitoring in Icelandic waters during 2015 from Directorate inspectors included 81 days spent on gillnet vessels, as well as 553 days on demersal trawl vessels fishing within the Icelandic EEZ. Target species in the gillnet fisheries were cod (60 days observed) and lumpsucker (*Cyclopterus lumpus*; 21 days observed), while demersal fish (gadoids, redfish and flatfish species) were the target species in the demersal trawl fishery.

Observed marine mammal bycatch in Icelandic fisheries was 20 harbour porpoises, 20 harbour seals, 17 grey seals, six harp seals, two ringed seals and one hooded seal.

Observed seabird bycatch in the fisheries was 92 eider ducks, 43 common guillemots, 40 northern fulmars, 12 black guillemot, 13 cormorants, nine northern gannets, two Atlantic puffins, and two Brünnich's guillemots. The majority of the bycaught animals were taken in gillnets, although one harbour seal and one northern gannet were observed in demersal trawls.

Total estimated bycatch of marine mammals for 2015 in observed Icelandic gillnet and demersal trawl fisheries was approximately 1400 harbour seals, 1200 grey seals, 800 harbour porpoises, 140 ringed seals and 50 hooded seals.

Total estimated bycatch of seabirds for 2015 was approximately 6600 eider ducks, 1900 guillemots, 1700 fulmars, 900 black guillemots, 400 northern gannets, 100 puffins and 80 Brünnich's guillemots (thick-billed murre). These estimates are likely to be biased high, as observed effort was low and the coefficient of variance around those estimates is very high (40–100%).

**2016 data on seabirds from various fisheries (longline, gillnets)**
Monitoring of Icelandic waters was conducted by the Marine and Freshwater Research Institute (MFRI) in 2016. The primary purpose of the monitoring was to have bycatch estimates of seabirds and marine mammals available for fishery certification purposes. This included[274]:

- 57 trips/days on lumpsucker gillnet vessels,
- 60 trips/days on cod gillnet vessels,
- 61 trips/780 days on demersal trawl vessels,

[273] http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WGBYC/wgbyc_2017.pdf
[274] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf

- 72 trips/230 days on longline vessels, and three trips/days in monkfish gillnets, fishing within the Icelandic EEZ.

Observed seabird bycatch in the cod fishery was 17 northern fulmars, three loons (Gavia spp.), two eider ducks and one common guillemot.

As part of Iceland becoming part of the ICES Working Group on Bycatch of Protected Species (WGBYC) in 2017, the following information on seabird and marine mammal bycatch for 2016 was submitted to the bycatch working group. This information offers some additional detail in regards to bycatch rate of individuals per days at sea.[275]

**Table 26.** Total number of bycatch specimens (all fisheries) or *number of incidents reported and bycatch rates (number of specimens/days at-sea or *number of incidents per days at-sea) derived from the ICES WGBYC 2016 data call. Bycatch numbers and rates are grouped by ecoregion, taxa, métier and species.

| Ecoregion | Taxa | ICES Subarea | Métier3 | Species | Total Observed Effort (Days at-sea) | Fishing Effort (Days at-sea) | Total No. Incidents | Total No of Specimens *Incident reported but not No of specimen | Bycatch Rate No of specimen per day at-sea observed *No of incidents per days at-sea | Reported Bycatch Estimate by MS |
|---|---|---|---|---|---|---|---|---|---|---|
| Iceland Sea | Bird | 27.5.a | Longlines | *Fulmarus glacialis* | 230 | NA | 11 | 11 | 0.05 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Cepphus grylle* | 120 | NA | 6 | 16 | 0.13 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Clangula hyemalis* | 120 | NA | 1 | 1 | 0.01 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Fratercula arctica* | 120 | NA | 1 | 1 | 0.01 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Fulmarus glacialis* | 120 | NA | 9 | 17 | 0.14 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Gavia immer* | 120 | NA | 2 | 3 | 0.03 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Phalacrocorax* spp. | 120 | NA | 1 | 1 | 0.01 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Somateria mollissima* | 120 | NA | 11 | 34 | 0.28 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Uria aalge* | 120 | NA | 4 | 13 | 0.11 | NA |
| Iceland Sea | Bird | 27.5.a | Nets | *Uria lomvia* | 120 | NA | 1 | 1 | 0.01 | NA |
| Iceland Sea | Marine mammal | 27.5.a | Bottom trawls | *Halichoerus grypus* | 780 | 33 | 1 | 1 | 0.001 | NA |
| Iceland Sea | Marine mammal | 27.5.a | Nets | *Erignathus barbatus* | 120 | NA | 2 | 2 | 0.02 | NA |
| Iceland Sea | Marine mammal | 27.5.a | Nets | *Halichoerus grypus* | 120 | NA | 4 | 46 | 0.38 | NA |
| Iceland Sea | Marine mammal | 27.5.a | Nets | *Pagophilus groenlandicus* | 120 | NA | 4 | 4 | 0.03 | NA |
| Iceland Sea | Marine mammal | 27.5.a | Nets | *Phoca vitulina* | 120 | NA | 7 | 11 | 0.09 | NA |
| Iceland Sea | Marine mammal | 27.5.a | Nets | *Phocoena phocoena* | 120 | NA | 33 | 44 | 0.37 | NA |

**Interactions with Marine Mammals**

Bycatch of seabirds, small cetaceans, and seals is known to occur in bottom setnets, particularly in Breidafjordur (western Iceland) and in the north. Harbour porpoise (*Phocoena phocoena)* is the most commonly bycaught marine mammal, but seals are also caught, especially in the lumpsucker *Cyclopterus lumpus* fishery.

**Table 27.** Estimated numbers of marine mammal by-catch by species and fishing gear type in Icelandic waters in 2014-2016 from the standard raising methods. Standard deviation of the estimate is shown in the brackets (source: NAMMCO, 2017[276]).

275 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf

276 NAMMCO 2017. Report of the 24th Scientific Committee meeting, 14-17 November 2017. https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf

| Species | Cod gill nets | | | Lumpfish nets | | | Other gear | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Harbour porpoise | 551 (30) | 553 (48) | 2618 (77) | 139 (61) | 215 (75) | 374 (153) | 0 (0) | 0 (0) | 0 (0) | 690 | 768 | 2992 |
| Harbour seal | 0 (0) | 46 (0.7) | 0 (0) | 232 (116) | 1,288 (1335) | 624 (356) | 0 (0) | 86 (3.3) | 0 (0) | 232 | 1,420 | 624 |
| Gray seal | 0 (0) | 0 (0) | 0 (0) | 162 (118) | 1,216 (1824) | 2870 (9820) | 0 (0) | 0 | 0 (0) | 162 | 1,216 | 2,870 |
| Harp seal | 92 (1.5) | 212 (7.7) | 144 (7.0) | 23 (7.5) | 72 (61) | 187 (42) | 0 (0) | 0 (0) | 0 (0) | 115 | 284 | 331 |
| Ringed seal | 38 (1.0) | 0 (0) | 0 (0) | 46 (7.5) | 143 (31) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 84 | 143 | 0 |
| Hooded seal | 0 (0) | 46 (0.7) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 | 46 | 0 |
| Bearded seal | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 124 (23) | 0 (0) | 0 (0) | 0 (0) | 0 | 0 | 124 |
| Total | 681 | 857 | 2,762 | 602 | 2,934 | 4179 | 0 | 86 | 0 | 1,283 | 3,877 | 6,941 |

The 2018 NAMMCO Scientific committee report[277] only provided (raised) data in 2017 for the lumpfish fishery, but not for the cod gillnet fishery in 2017. However, observed marine mammal bycatch in the cod fishery in 2017[278] was 28 harbour porpoises and 1 ringed seal, and 1 harp seal in the demersal trawl fishery. Hence, we use data up to 2016 for the analysis below.

**Icelandic Redlist on Marine Mammals**

In 2018, the first National Redlist on Icelandic mammals based on the IUCN criteria was published by the Icelandic Institute of Natural History in co-operation with MFRI[279]. In total 18 species were assessed. North Atlantic right whales and harbour seals were classified as critically endangered (CR) while blue whales and grey seals were assessed as vulnerable (VU). Both cetacean species harvested by Iceland, fin whales and common minke whales, were assessed as least concern (LC) as were seven other cetacean species including humpback whales and sei whales. Two species (sperm and N-bottlenose whales) could not be assigned conservation status due to data deficiency (DD)[280].

**Harbour porpoises (*Phocoena phocoena*) interactions**

Harbour porpoises are classified as Least Concern in the IUCN Red List[281] (population trend unknown, last assessed in 2008). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)[282]. Annual estimates of harbour porpoise by-catch have decreased in recent years as gillnet effort has decreased (see table below), from a high of 7,300 animals in 2003 to about 1600 animals in 2009–2013[283] and down to about 750 animals in 2014-2015. There was an increase in harbour porpoise by-catch in cod gillnets

[277] https://nammco.no/wp-content/uploads/2017/01/sc-report-2018_270519_cor250619_rec-walrus.pdf

[278] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/HAPISG/2019/ICES%20WGBYC%20Report%202019.pdf

[279] https://www.ni.is/midlun/utgafa/valistar/spendyr/valisti-spendyra

[280] https://nammco.no/wp-content/uploads/2019/04/2018-iceland_progress_report_final2.pdf

[281] https://www.iucnredlist.org/species/17027/6734992

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

[283] 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

in 2016. The rate is four times higher compared to 2015 (with the same amount of observer effort), suggesting that harbour porpoise density on the fishing grounds might be changing[284].

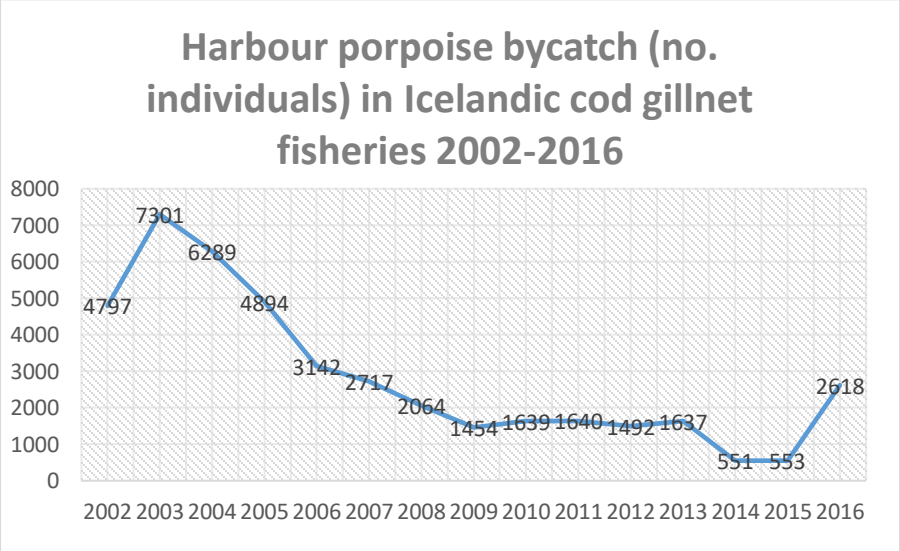



**Figure 55.** Bycatch of harbour porpoise in the Icelandic cod gill net fishery from 2002 to 2016. Data pulled together from Pálsson et al. 2015 and the 2017 NAMMCO 24th Scientific Committee Meeting Report. Note that these numbers exclude catches in the lumpsucker fishery (see table below for details of 2014-2016 numbers).

It was suggested that Iceland examine trends in commercial effort in the cod fishery over time, because the change in the by-catch estimate (the 2015 estimate went from 553 to 2,618 in 2016) might be influenced by increases in commercial fishing effort, in addition to higher by-catch rates. However, the cod gillnet effort has been more or less stable since 2008 (see figure below).

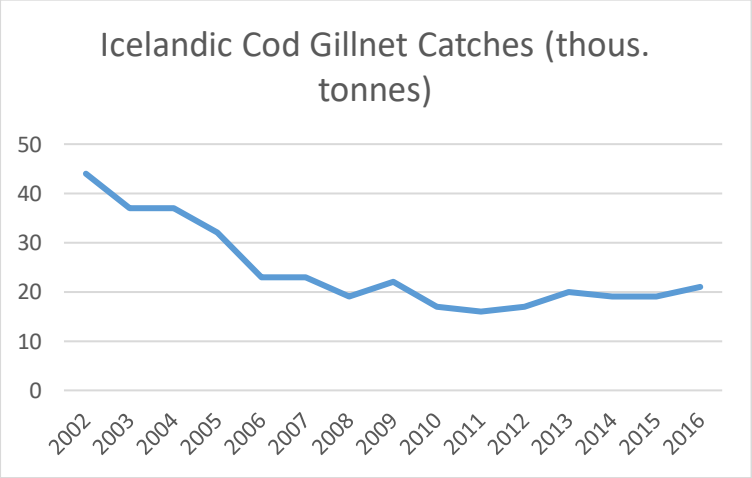



**Figure 56a**. Icelandic cod gillnet catches (thous. tonnes) from 2002 to 2016.[285]

[284] https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf
[285] https://www.hafogvatn.is/static/extras/images/%C3%BEorskur%20(5)731728.pdf

The estimated harbour porpoise by-catch in 2016 was ~2-9% of the 2007 abundance estimate of 43,179 (43,179 animals, 95% confidence intervals of 31,755-161,899[286]), but it is important to note that the 2007 estimate is considered to be a minimum estimate based on an incomplete aerial survey.

The NAMMCO Bycatch Working Group met in April 2018 and reported[287] that they did not endorse the recent by-catch estimates presented for harbour porpoises in Iceland and the recommended analyses should be presented to the BYCWG at its next meeting before a more reliable estimate could be endorsed. However, regarding the need for information on harbour porpoise by-catch rates off Iceland for the upcoming International Workshop on the Status of Harbour Porpoises in the North Atlantic (WSHPNA), the WG agreed that as an interim measure the stratified estimate presented, i.e. 1841 porpoises a year, could be considered as an upper bound for the by-catch in cod gillnets for the period 2013-2017. This estimate presumes that April bycatch rates (from the MFRI survey) are indicative of activity in other months and is based on the porpoise availability index which might need some more tweaking. The WG is therefore concerned, that the harbour porpoise bycatch estimate for cod gillnet might be lower than the presented stratified estimate.

**Annual anthropogenic induced mortality reference point for harbour porpoise**

ASCOBANS has advised that the maximum annual anthropogenic induced mortality for harbour porpoise should not exceed 1.7% of the total population size[288] and this threshold is likely to have been met or exceeded in 2016. However, Pálsson *et al*., (2015) suggested that the higher numbers of harbour porpoise occurring in the cod gillnet fishery in recent years could indicate an increase in the porpoise stock and perhaps that the replacement potential of the porpoise population may be higher than implied by the precautionary 1.7% reference point. An alternative explanation may be that, as previously mentioned, the 2007 mean population estimate was a significant under-estimate and the population is bigger than the survey suggested such that it is able to sustain the levels of by-catch observed over the years. It has been suggested that the higher by-catch in 2016 is a result of changing harbour porpoise density on the fishing grounds. The rapid change in by-catch between years does suggest a significant change in distribution (perhaps linked to environmental conditions).

In 2016 an aerial survey was performed. Despite the poor coverage in it, the uncorrected harbour porpoise population estimate is at least double that of all previous estimates other than that from 2007, when a specialist harbour porpoise observer was employed and all known biases were corrected. Availability bias is likely substantial for this species but dive profile data from the survey area are lacking[289]. This data, although not definitive at this point, appears to imply that the harbour porpoise is increasing and as such, may not be below biological limits.

Information from the Report of the Joint IMR/NAMMCO International Workshop on the Status of Harbour Porpoises in the North Atlantic (December 3rd - 7th 2018, Tromsø, Norway)[290] reported abundance information for harbour porpoise in Iceland showing bycatch information and an increase in abundance.

[286] Gilles *et al.* Harbour porpoise *Phocoena phocoena* summer abundance in Icelandic and Faroese waters, based on aerial surveys in 2007 and 2010. http://www.hafro.is/Bokasafn/Greinar/sc_18-AESP11.pdf
[287] https://nammco.no/wp-content/uploads/2019/01/bycwg-october_2018_final-report_291118.pdf
[288] OSPAR, 2009. Background Document for Harbour porpoise Phocoena phocoena. OSPAR Commission. http://www.ascobans.org/en/document/ospar-background-document-harbour-porpoise-phocoena-phocoena
[289] https://nammco.no/wp-content/uploads/2018/09/report_aewg_2018_final.pdf
[290] https://nammco.no/wp-content/uploads/2019/02/final-report_hpws_2019.pdf#page=34&zoom=100,64,350

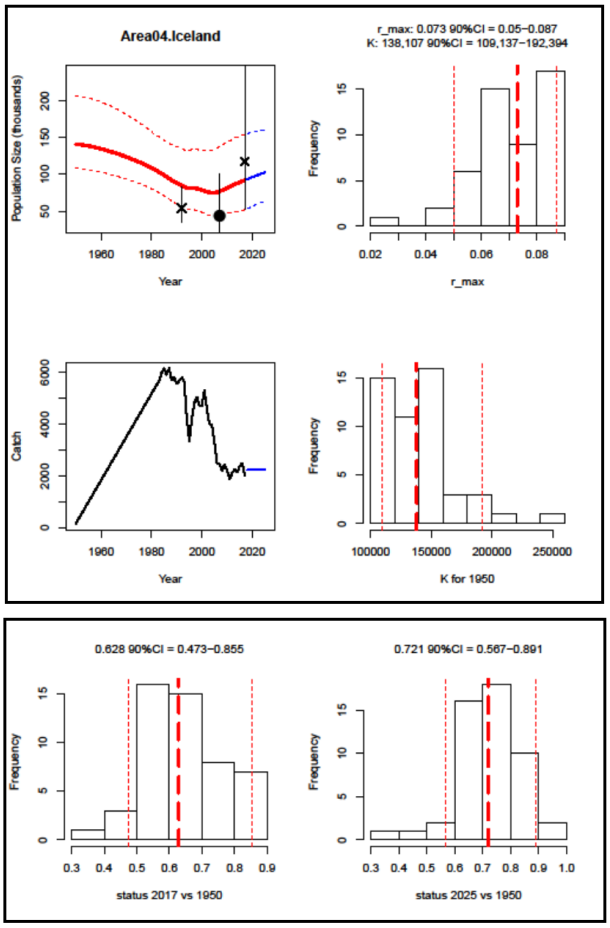



**Figure 57*b***. Assessment of the harbour porpoise population in the Iceland assessment area using a population dynamic model (Zerbini et al. 2011). Upper left panel: Estimated population abundance in the given period. Upper right panel: Estimated median rmax (bolded hatched line) given with a 90% credible interval. Middle left panel: Estimated annual by-catch over the given period (used as model input). Middle right panel: Estimated median K1950 given with a 90% credible interval. Lower left panel: Estimated abundance median current depletion level (2017 abundance relative to K1950) with a 90% credible interval. Lower right panel: Predicted median future depletion level (2025 predicted abundance relative to K1950) with 90% credible interval.

The conclusion of the NAMMCO assessment is that the population in the Icelandic area seems to be recovering. Furthermore, based on the model run outputs, the PBR for 2018 is around 3500 porpoises.

**Genetic research**

Collaboration of the MFRI with the University of Potsdam on harbour porpoise genetic research is ongoing (Lah et al. 2016). Among the objectives of this study is estimation of population size based on close kin analysis[291]. In 2017 fishermen for the first time received a payment for each harbour porpoise DNA tissue sample that they send in to the MFRI, and this is clearly resulting in an increase in samples and in the recording of by-catch. Around 200 samples have been received per year this way in addition to the samples from bycaught porpoises

[291] https://nammco.no/wp-content/uploads/2019/04/2018-iceland_progress_report_final2.pdf

in the gillnet survey around Iceland in the spring and occasional samples from stranded animals. Preliminary results were presented to a workshop on harbour porpoises in November 2018.

**Marine mammals bycatch reduction devices trials**

Acoustic porpoise deterrents (pingers) were tested for the first time in the Icelandic cod gillnet fishery in April of 2017, but their use showed no reduction in porpoise bycatch, as 7 porpoises got caught in nets with pingers, while 5 porpoises got caught in control nets nearby. Another type of porpoise deterrents (PALs) were tested in the cod gillnet fishery in April of 2018 and like the pingers, showed no reduction in porpoise bycatch as 12 porpoises were caught in nets with the devices, while 11 porpoises got caught in the control nets. Almost all the bycaught porpoises in the PAL sets (eleven out of twelve) were large adult males, while the gender ratio was six males and five females in the control sets. Interestingly, eight of the twelve porpoises caught in the PAL sets were found right by the PAL device, suggesting possible attraction of adult males towards the PAL devices[292]. Further trials with pingers were planned for April 2019[293].

**Seals bycatch monitoring in 2017**

Bycatch of marine mammals was monitored in all major fisheries in Icelandic waters in 2017, through (limited) logbook submissions, reports from onboard inspectors from the Directorate of Fisheries and in the MFRI annual gillnet survey. The 2018 NAMMCO Scientific Working Group on By-catch reported very unreliable estimates of seal bycatch based on MFRI survey, inspector and logbook data (where an issue with identification of seals seem to be present). The WG did not endorse any of the 2017 by-catch estimates presented for seals in Iceland during the 2018 meeting and stated that the recommended analyses should be presented to the BYCWG at its next meeting before an estimate can be endorsed [294].

**Harbour seals interactions**

Six pinniped species occur in the Icelandic Waters ecoregion but only two of these breed locally (grey seals and harbour seals). Both species are currently in decline. Harbour seals are classified as Least Concern in the IUCN Red List[295] (population trend is unknown, last assessed in 2016). However, harbour seals are currently classified as Critically Endangered on the Icelandic National Red list, based on IUCN criteria[296] and 2016 population estimates[297].

In 1980, the abundance of harbour seals was estimated at around 33,000 animals but the population declined rapidly until 1989 to around 15,000 animals. The 2018 harbour seal census resulted in a population estimated of 9,434 animals (95% confidence intervals of = 6,149-12,726). The 2019 MFRI Advice indicates that current population size is 72% smaller than the first abundance estimate from 1980 and the population is 21% under the management objective of 12,000 animals.[298]

292 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/HAPISG/2019/ICES%20WGBYC%20Report%202019.pdf

293 https://nammco.no/wp-content/uploads/2019/04/2018-iceland_progress_report_final2.pdf

294 https://nammco.no/wp-content/uploads/2019/01/bycwg-october_2018_final-report_291118.pdf

295 https://www.iucnredlist.org/species/17013/45229114

296 https://www.ni.is/midlun/utgafa/valistar/spendyr/valisti-spendyra

297 https://www.ni.is/node/27368

298 https://www.hafogvatn.is/static/extras/images/landselur_191145061.pdf

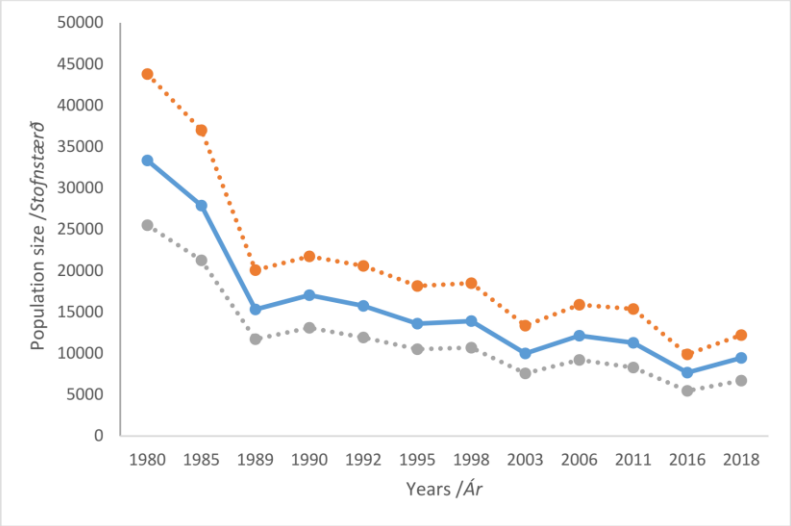



**Figure 58.** Trends in the Icelandic harbour seal population from 1980 to 2018. The mean values (solid blue line) are the estimated population size for respective years. The 90% confidence intervals indicated with dotted lines (90% CI low = grey line and 90% CI high = orange line).

Traditional sealing using nets has decreased in recent decades, but culling around river mouths to reduce the effect that seals are thought to have on salmon fisheries is still common. Seal bycatch in gillnets is also high.

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 ± 486 (± CV*estimate) 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=1.02) and 17 harbour seals in bottom trawls (CV=1.00) (Marine and Freshwater Institute, in prep.)[299].

Based on these most recent estimates, 97.7% of the harbour seal bycatch can be attributed to the lumpfish fishery and the reminder 1.07% to the cod gillnet fishery and 1.22% to the bottom trawl fishery. In the bottom trawl fishery, cod made up less than 50% of total catches in the past 3 seasons, hence this fishery is responsible for about 0.6% of the harbour seal bottom trawl bycatch.

Current harbour seal bycatch is for the most part dependent upon lumpsucker fishery effort[300].

A full population survey was conducted during the moulting period in 2018 and the data analysis is currently ongoing. The current aim is to conduct aerial population censuses every second year while the population is under the target level. The MFRI advice to the Ministry has been: “that direct hunt should be prevented and that actions must be taken to reduce by-catch of seals in commercial fisheries. MFRI also advices that a hunting management system should be initiated, and that reporting of all seal hunt should be mandatory.” No legislation and no new management objective is in place. However, Icelandic authorities are investigating possibilities of how legislation on seal hunting and obligatory reporting of catch statistics can be implemented.

[299] https://www.hafogvatn.is/static/extras/images/landselur_191145061.pdf
[300] https://www.hafogvatn.is/static/research/files/hv2017-009pdf

There is an increased effort to improve by-catch data collection. MFRI will define a population level objective based on biological criteria[301].

**Grey seals interactions**

The Icelandic grey seal (*Halichoerus grypus*) population has decreased from an estimated 9000 animals in 1982 to 4200 animals in 2012. They are classified as Least Concern (population increasing, last assessed in 2016) on the IUCN Red List[302] but as Vulnerable in the Icelandic National Red List[303] based on a 2018 assessment.

The Icelandic management objective from 2005 states that the Icelandic grey seal population size should be kept above 4100 animals, which corresponds to the observed population size from 2004. The population is currently estimated in the 2019 MFRI Advice to be 6300 animals, which is 50% above the management objective. If the population decreases significantly measures will be taken to reverse the trend. Close monitoring of the population is advised. MFRI advises that actions must be taken to reduce by-catch of grey seals in commercial fisheries. MFRI also advices that a hunting management system should be initiated, and that reporting of all seal hunt should be mandatory.

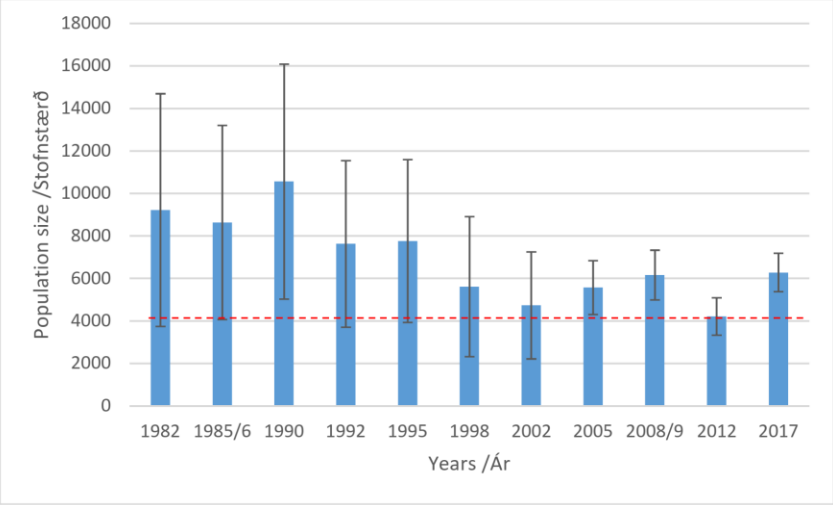



**Figure 59.** Grey seal. Stock size with 95% confidence intervals. The broken line indicates the management objective.

No gray seals were estimated to have been bycaught by the cod gillnet fishery between 2014 and 2016 (see table 1 of 2017 NAMMCO report[304]), but in 2013 it was estimated that 33 grey seals were bycaught in cod gillnet fisheries. This is compared to an average of 989 grey seals caught in the lumpsucker fishery between 2014-2018[305]. The effects of the cod fishery on this species is not considered significant and the most recent estimate of stock size is within management targets.

[301] https://nammco.no/wp-content/uploads/2017/01/sc-report-2018_270519_cor250619_rec-walrus.pdf
[302] https://www.iucnredlist.org/species/9660/45226042
[303] https://www.ni.is/node/27369
[304] https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf
[305] https://www.hafogvatn.is/static/extras/images/utselur_20191125514.pdf

**Harp Seals**

The harp seal (*Pagophilus groenlandicus*) population is found in three separate populations, each of which uses a specific breeding site. The western North Atlantic stock, which is the largest, is located off eastern Canada. A second stock breeds on the "West Ice" off eastern Greenland, which contributes to Icelandic individuals. The cod gillnet fleet appears to have some interactions with harp seals. 92 seals were caught in 2014, 212 in 2015 and 144 in 2016. There does not appear to be much information available specific to Iceland, but the species is considered Least Concern in the IUCN Red List with increasing population at 4.5 million individuals, based on a 2015 assessment[306].

**Ringed and hooded seals**

The interaction between cod gillnet fisheries and ringed seals and hooded seals appear to be quite limited. 38 ringed seals (*Pusa hispida*) were caught in 2014 (none in 2015 and 2016), while 47 hooded seals (*Cystophora cristata*) where caught in 2015 (none in 2014 and 2016). Ringed seals are considered Least Concern[307] in the IUCN Red List (as well as being marked as non-resident or breeding in Iceland), while hooded seals are considered Vulnerable in the IUCN Red List[308] (last assessed in 2015). Hooded seals are native and resident to Canada, Greenland and Iceland, their current estimated population is 340,000 mature individuals and their population trend is unknown.

The ICES/NAFO/NAMMCO working group on harp and hooded seals (WGHARP) will meet in Tromsø, Norway, 2-6 September 2019. New data from all populations is available and the group will do assessments of status and harvest potentials[309].

**Seabirds bycatch**

The 2018 ICES Ecosystem Overview[310] on the Icelandic Ecoregion reports that the main bycaught seabird species are northern fulmar *Fulmarus glacialis*, common murre *Uria aalge*, northern gannet *Sula bassana*, black guillemot *Cepphus grylle*, and common eider *Somateria mollissima*, all caught in bottom setnets. Bycatches in gillnets targeting cod have decreased, associated with a large decrease in effort.

Pálsson *et al*. (2015[311]) used data from the annual MFRI cod gill net survey, which mimics fleet effort and represents approximately 2% of the total effort in the fishery, to assess by-catches of seabirds in gillnets (excluding the lumpsucker fishery). The study found that seabird by-catch in gillnets was made up of 13 species (see table below). They also highlighted that these estimates are based on limited data that needs to be increased and improved with a functioning reporting system for the fishery and better follow up.

**Table 28**. Recorded numbers of sea birds in gill nets. a) MFRI cod gill net survey (SMN), sea birds 2009-2014 (Source: Pálsson et al., 2015).

[306] https://www.iucnredlist.org/species/41671/45231087#conservation-actions
[307] https://www.iucnredlist.org/species/61382318/61382321
[308] https://www.iucnredlist.org/species/6204/45225150
[309] https://nammco.no/wp-content/uploads/2017/01/sc-report-2018_270519_cor250619_rec-walrus.pdf
[310] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/IcelandicWatersEcoregion_EcosystemOverview.pdf
[311] https://www.hafogvatn.is/static/research/files/fjolrit-178pdf

| Sjófuglar *Sea birds* | | a) Netarall *Gill net survey* | |
|---|---|---|---|
| Tegund *Species* | Visindaheiti *Scientific name* | Fjöldi *Numbers* | % |
| Langvía *Common guillemot* | *Uria aalge* | 554 | 72,1 |
| Stuttnefja *Brunnich's guillemot* | *Uria lomvia* | 11 | 1,4 |
| Svartfugl ógr. *Guillemots* | *Alcidae* | 17 | 2,2 |
| Lundi *Puffin* | *Fratercula arctica* | 1 | 0,1 |
| Álka *Alk* | *Alca torda* | 4 | 0,5 |
| Teista *Black guillemot* | *Cepphus grylle* | 1 | 0,1 |
| Fýll *Fulmar* | *Fulmarus glacialis* | 144 | 18,8 |
| Súla *Northern gannet* | *Morus bassanus* | 24 | 3,1 |
| Æðarfugl *Eider* | *Somateria mollissima* | 8 | 1,0 |
| Himbrimi *Great northern diver* | *Gavia immer* | 0 | 0,0 |
| Lómur *Loom* | *Gavia stellata* | 1 | 0,1 |
| Skarfur ógr. *Cormorants* | *Phalacrocoracidae* | 0 | 0,0 |
| Hávella *Long-tailed duck* | *Clangula hyemalis* | 3 | 0,4 |
| Samtals *Total* | | 768 | 100,0 |

Pálsson *et al.*, (2015) did not record any observations of seabirds in the bottom or pelagic trawl fisheries.

In a very crude approximation, if the 2% effort coverage mentioned in the Pálsson *et al.*, (2015) study was to be raised to 100% to represent the full gillnet effort, the highest annual take would belong to common guillemot at 0.39%, northern gannet at 0.32% and loom at 0.33% a year. All the other species would have an annual take well below 0.1% of their estimated population size. Population size of each species was taken from the seabird Red list estimates of the Icelandic Institute of Natural History https://en.ni.is .

In 2016, the observed seabird bycatch in the cod fishery was 17 northern fulmars, three loons (Gavia spp.), two eider ducks and one common guillemot[312].

**2014-2016 seabird bycatch in the cod fishery**

More up to date for this assessment, the MFRI provided data from 2014-2016 with a rough estimated annual bycatch of seabirds in cod gillnets, longlines and otter trawl. Variance around the estimate (based on the CV) is shown in brackets.

**Table 29.** Icelandic cod fishery (gillnet, longline, otter trawl) annual seabird estimated bycatch from 2014-2016, including estimates of annual removal.

| Species | Cod gillnets | Longline | Otter trawl | Iceland Institute of Natural History (INH) Red List Classification | Population estimated in INH's 2018 Red List | Annual bycatch % removal of estimated population* |
|---|---|---|---|---|---|---|
| Northern fulmar (*Fulmarus glacialis*) | 1702 (1362-2042) | 920 (340-1500) | 0 | Endangered | 1.2 million pairs | 0.11% |

312 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf

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

***Note, the potential decline trajectory of these populations resulting from their INH Red List classification has not been taken into account in the annual percentage removal calculation.**

Observed seabird bycatch in 2017[313] in the cod gillnet fishery was 3 northern fulmars, 2 gannets, and 8 common guillemots.

No seabirds were observed in the demersal trawl fishery.

Observed seabird bycatch in the longline fishery was 69 northern fulmars, 24 northern gannets, 5 lesser black-backed gulls, and 35 herring gulls.

No raised estimates were available for 2017 but we note that an up to date report on cod bycatch is due for publication towards the end of 2019 (Guðjón Már Sigurðsson, MFRI, pers. comm, 15th August 2019).

**Seabird status**

Based on Pallson et al. (2015), Common Guillemot (72% of encounters) and Northern fulmar (19% of encounters) were the species most frequently caught in the cod gillnet MFRI survey and likely to occur in those fisheries too. Furthermore, these two seabird species were also the most frequently caught in the 2014-2016

313 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/HAPISG/2019/ICES%20WGBYC%20Report%202019.pdf

cod estimates (gillnet, longline, trawl) provided by the MFRI. Information on these two species as well as other minor bycatch species (including a discussion on common loon) from the 2014-2016 dataset are listed below.

**Common Guillemot**

Common Guillemot (*Uria aalge*) is found on Annex I of the EU Birds Directive. With the implementation of bird protection laws, a slow recovery occurred over much of the Atlantic breeding range up to the early 1970s except in north Norway, the Faeroes and probably Iceland (Nettleship et al. 2018). At major colonies, detailed monitoring is needed, particularly in Iceland, which suffered a large decline post-2005 (Nettleship et al. 2018). In 2018, this species is categorised as Least Concern in the IUCN Red List with increasing population. The European population is estimated at 2,350,000-3,060,000 mature individuals (BirdLife International 2015). [314]

*Uria aalge* is a common breeding bird in Iceland with 693,000 pairs; ten colonies are of international importance (≥10.000 pairs) and all the population breeds within important bird areas IBAs. It is listed as Vulnerable (VU, A4abc) in the Icelandic Red list 2018[315], uplisted from Least concern (LC) in 2000.

The annual removal by the cod fishery is estimated at 0.03% and not considered significant.

**Northern fulmar**

Northern fulmar (*Fulmarus glacialis*) is covered by the EU Birds Directive as a migratory species. In Europe it occurs within 29 marine Important Bird Areas, including in the Faroe Islands, France, Germany, Iceland, Svalbard (Norway) and the United Kingdom. Within the EU it is listed within 46 Special Protection Areas. Under the EU Marine Strategy Framework Directive it will be monitored for plastic ingestion. Mitigation measures have been developed to reduce bycatch of the species (Løkkeborg and Robertson 2002). Based on a 2018 assessment Northern Fulmar is categorised as Least Concern in the IUCN red list, with 7 million mature individuals and an increasing population trend[316].

*Fulmarus glacialis* is the second most common breeding bird in Iceland with 1.2 million pairs; 38 colonies are of international importance (≥10.000 pairs) and 81.5% of the population breed within important bird areas (IBA). It is listed as Endangered (EN, A4abc) in the Icelandic Red list 2018[317], uplisted from Least concern (LC) in 2000. The annual removal by the cod fishery is estimated at 0.11% and not considered significant.

**Northern Gannet**

Northern Gannet (*Morus bassanus*) is listed on the African Eurasian Waterbird Agreement. It is covered by the EU Birds Directive as a regularly occurring migratory species. In Europe it is currently listed within 34 marine Important Bird Areas. Within the EU, it is currently listed within nine Special Protection Areas. In 2018, this species is categorised as Least Concern in the IUCN Red List with an increasing population trend ranging between 1.5 and 1.8 million mature individuals[318].

*Morus bassanus* is most common seabird off southern Iceland with 37,000 pairs in 2013/2014; two colonies are of international importance (≥10,000 pairs) and all the population breeds within IBAs.

[314] https://www.iucnredlist.org/species/22694841/132577296#conservation-actions
[315] https://www.ni.is/node/27097
[316] https://www.iucnredlist.org/species/22697866/132609419#conservation-actions
[317] https://www.ni.is/node/26962
[318] https://www.iucnredlist.org/species/22696657/132587285#conservation-actions

Icelandic Red list 2018 classification[319]: Vulnerable (VU, D2), the same as the last assessment in 2000.

The annual removal by the cod fishery is estimated at 0.23% and not considered significant.

**Common Eider duck**

Common Eider (*Somateria mollissima*) is listed in the EU Birds Directive Annex II and III. CMS Appendix II. Changes to hunting regulations in Greenland in 2001 shortened the length of the hunting season which is thought to have led to a rapid increase in population size (Burnham et al. 2012). However the hunting regulations have recently changed and the effect on the population is not yet known. Restrictions were also introduced in Denmark in 2004/2005 and 2011/2012 with the aim of reducing the proportion of female birds killed and increasing the population growth rate (Christensen and Hounisen 2014). Based on a 2018 assessment, this species is categorised as Near Threatened in the IUCN Red List with an unknown population trend. The European population is estimated at 791,000-955,000 pairs[320].

*Somateria mollissima* is a common breeding bird in Iceland. The winter population is estimated to be 850,000 birds, including some tens of thousands from NE-Greenland and Svalbard. Approx. 44% of the birds breed in designated IBAs and approx. 31% of the birds moult in such areas.

Icelandic Red list 2018 Classification[321]: Vulnerable (VU, A2b), uplisted from Least concern (LC) in 2000.

The annual removal by the cod fishery is estimated at 0.02% and not considered significant.

**Razorbill**

Razorbill (*Alca torda*) is listed on the African-Eurasian Waterbird Agreement. There are 91 Important Bird Areas across the region for this species. Within the EU there are 91 Special Protected Areas for this species, recognised as a regularly occurring migratory species. The species is considered in the Nordic Action Plan for seabirds in Western-Nordic areas (TemaNord 2010). Last assessed in 2018, this species is categorised as Near Threathened in the IUCN Red List with a decreasing population trend. The European population is estimated at 979,000-1,020,000 mature individuals (BirdLife International 2015). Although a number of populations are increasing within Europe, a recent sharp decline was observed in Iceland (where more than 60% of the European population is found) since 2005 (BirdLife International 2015). Two comprehensive surveys of the species in Iceland suggest that the population declined by 18% between 1983-1986 (Gardarsson 1995) and 2005-2009 (Gardarsson et al. in press) from 378,000 pairs to 313,000 pairs. Evidence of a very rapid decline in the Icelandic population is supported by data from the largest colony of this species in the world, Látrabjarg, which declined by 45% in only three years (160,000 pairs in 2006 to 89,000 pairs in 2009) (G. Gudmundsson in litt. 2015). The 2005 decline occurred around the same time that sandeel stocks crashed around Iceland, suggesting that a lack of food may have influenced the decline (Gardarsson et al. in press). As a result of the reported decline in Iceland, the estimated and projected rate of decline of the European population size over the period 2005-2046 (three generations) is 25-29%[322].

[319] https://www.ni.is/node/27100
[320] https://www.iucnredlist.org/species/22680405/132525971#conservation-actions
[321] https://www.ni.is/node/27107
[322] https://www.iucnredlist.org/species/22694852/131932615#population

*Alca torda* is a common breeding bird in Iceland with 313,000 pairs; ten colonies are of international importance (≥10.000 pairs) and all the population breeds within IBAs.

Icelandic Red list 2018 Classification[323]: Near threatened (NT), uplisted from Least concern (LC) in 2000.

The annual removal by the cod fishery is estimated at 0.00% and not considered significant.

**Atlantic Puffin**

Atlantic puffin (*Fratercula arctica)* is listed under the African Eurasian Waterbird Agreement. It is included in the Action Plan for Seabirds in Western-Nordic Areas (TemaNord 2010). There are 76 marine Important Bird Areas identified across the European region. Within the EU there are 40 Special Protection Areas which list this species as occurring within its boundaries. In 2018, this species is categorised as Vulnerable in the IUCN Red List with a decreasing population trend. The European population is estimated to be 4,770,000-5,780,000 pairs, which equates to 9,550,000-11,600,000 mature individuals (BirdLife International 2015)[324].

*Fratercula arctica* is the most common breeding bird in Iceland with approx. 2 million pairs; ten colonies are of international importance (≥10.000 pairs) and approx. 98% of the population breeds within IBAs.

Icelandic Red list 2018 Classification[325]: Critically Endangered (CR, A4abc), uplisted from Least concern (LC) in 2000.

The annual removal by the cod fishery is estimated at 0.00% and not considered significant.

**Common loon or great northern diver**

The common loon or great northern diver (*Gavia immer*) is listed under Appendix II of the Convention on Migratory Species and under the African Eurasian Waterbird Agreement. It is listed in Article I under the EU Birds Directive. In Europe, it occurs in 20 Important Bird and Biodiversity Areas (IBAs), including in Iceland, Norway (Svalbard and mainland Norway), Ireland, the United Kingdom and in Spain. It is a listed species in 83 Special Protection Areas in the EU Natura 2000 network. Last assessed in 2018, this species is categorised as Least Concern in the IUCN Red List with a stable population trend. Wetlands International (2016) estimated the population at 612,000-640,000 individuals. In Europe the breeding population is estimated at 700-1,300 pairs, which equates to 1,400-2,600 mature individuals (BirdLife International 2015).[326]

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

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

The annual removal by the cod fishery is estimated at 16.4%.

[323] https://www.ni.is/node/27099
[324] https://www.iucnredlist.org/species/22694927/132581443#conservation-actions
[325] https://www.ni.is/node/27101
[326] https://www.iucnredlist.org/species/22697842/132607418#conservation-actions

The MFRI provided further clarification on common loon bycatch where they highlighted that the estimate has a large variance based on an actual catch of 3 birds over several years. The birds are only vulnerable to bycatch for part of the year before they move to freshwater for nesting, hence the potential for an overestimate. They also noted that these 3 birds were all caught in the same year, and that is only 3 birds caught since 2010 when proper reporting started in the MFRI survey. They continued with saying that the estimate would be much lower if they include data from 2017-2019, but that analysis has not been finalized yet (Guðjón Már Sigurðsson, MFRI, pers. comm, 17th September 2019).

In view of the lack of reliable data to establish more precise bycatch estimates across the fishery (due to logbook underreporting of seabird and marine mammal bycatch and limited Directorate's Inspectors coverage on fishing vessels), the Team treats the estimates provided by the MFRI in September 2019 as best available information, in the absence of better-quality data to counter it. Considering the above, the Assessment Team determines that the cod fishery is likely having an impact on the Icelandic *Gavia immer* population, partly due to the small population size of this species.

The inability to accurately measure trends in seabird/marine mammal bycatch over time makes it hard to establish whether a management response/strategy to reduce bycatch is needed and/or working.

**Accordingly, and in connection with the spotted wolffish status and management issue identified earlier the assessment team issues a minor non-conformance against clause 3.1.1.**

**Non-conformance #2 (Clause 3.1.1: Minor Non-conformance). There is insufficient evidence that adverse impacts of the cod fishery on the spotted wolffish and common loon ecosystem components are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.**

Status: Open, Corrective Actions in place to be reviewed annually at surveillance audits.

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.

We also note, for contextual clarity and outside the bounds of this assessment, that the gillnet fishery for lumpfish is also the cause of some common loon bycatch (see table 6 in the MFRI Mean catch of birds and marine mammals in lumpfish fishing 2014-2018 report [327]) likely contributing to the overall takes of this small population.

**Great Cormorants**

Great Cormorant (*Phalacrocorax carbo*) is listed under the African Eurasian Waterbird Agreement. Within its European range the species occurs in 242 Important Bird Areas. Within the EU it is listed in 245 Special Protection Areas. Last assessed in 2018 it was categorised as Least Concern in the IUCN Red List with an increasing population trend. The European population is estimated at 401,000-512,000 pairs, which equates to 803,000-1,020,000 mature individuals (BirdLife International 2015)[328].

[327] Meðafli fugla og sjávarspendýra í grásleppuveiðum 2014-2018 https://www.hafogvatn.is/static/extras/images/medafli-fugla-og-spendyra-i-grasleppuveidum1157500.pdf

[328] https://www.iucnredlist.org/species/22696792/132592923#population

*Phalacrocorax carbo* is a rather rare breeding bird in W-Iceland with 4,581 pairs in 2017; but has increased considerably at an all-time low in 1995 (2,346). The two main breeding areas are designated IBAs for this species and hold almost all of the population.

Icelandic Red list 2018 Classification[329]: Least concern (LC) as in 2000.

The annual removal by the cod fishery is estimated at 0.51% and not considered significant.

**Great-black backed gull**

Great-black backed gull (*Larus marinus*) is categorised as Least Concern in the IUCN Red List, last assessed in 2018, with a European population estimated at 118,000-133,000 pairs, which equates to 237,000-266,000 mature individuals or 360,000-400,000 individuals (BirdLife International 2015). This species used to be the most common gull in Iceland, but the population has declined dramatically in the past decades and is now roughly estimated 6,000−8,000 pairs. One area is designated IBA for this species and 63% of the birds may breed in IBAs.

Icelandic Red list 2018 classification: Endangered (EN, A2abc), uplisted from Vulnerable (VU) in 2000.

The annual removal by the cod fishery is estimated at 0.48% and not considered significant.

**Bycatch data from the lumpsucker fishery and applicability to other fisheries**

Of relevance to the fishery under assessment, the 2018 report on marine mammal and seabird bycatch in the lumpsucker fishery during 2014-2017 highlights that although reported bycatch in E-logbooks by the fleet has increased (suggesting better compliance with reporting requirements) the overall bycatch rates are still much lower than observed in the trips by inspectors. Overall, the marine mammal and seabird bycatch rate during inspector trips was around four times higher than reported by the fleet in 2017, which showed the need to use other data in addition to the log books. This difference also warrants an investigation into why fishermen do no report bycatch, and how reporting can be made easier. It is not clear how representative this compliance rate is of other Icelandic fisheries such as cod, haddock, saithe and redfish.

The North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on By-catch noted, in relation to by-catch data from the Iceland lumpsucker gillnet fishery, that logbooks do not provide a reliable source of data to use for estimating by-catch and strongly recommended that logbooks are not used for calculating/assuming by-catch rates, but only used as indicators for raising concerns when by-catch reporting is increasing[330].

A smartphone app is in development by the Directorate of Fisheries, aimed at making both reporting and identification of bycatch easier for operators in the fishery. For further details, please refer to the corrective actions section of this report.

[329] https://www.ni.is/node/27105

[330] NAMMCO (2018). Report of the NAMMCO Scientific Working Group on By-catch https://nammco.no/wp-content/uploads/2018/05/report-nammco-sc-bycwg-04042018.pdf

**Icelandic Committee for Consultation on Responsible Management of Living Marine Resources**

The Icelandic ministry of Industry and Innovation has recently created (i.e. November 2018) a Committee for Consultation on Responsible Management of Living Marine Resources to address matters concerning bycatches in the gillnet fisheries for lumpfish and cod. The document is shown below.

Samstarfsnefnd um bætta umgengni um auðlindir sjávar
Kristján Þórarinsson, formaður

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ATVINNUVEGA- OG NÝSKÖPUNARRÁÐUNEYTIÐ

*Ministry of Industries and Innovation*

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Reykjavík November 27, 2018
Reference: ANR18030330/11.02.09

Subject: Chariman of the Committee for Consultation on Responsible Management of Living Marine Resources

The Minister of Fisheries has appointed Dr. Kristján Thorarinsson as the chairman of The Committee for Consultation on Responsible Management of Living Marine Resources.

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

The committee has been tasked by the Minister of Fisheries to address matters concerning bycatches of seabirds and marine mammals in gillnet fisheries in Iceland (lumpfish and codfish).
It has the task of addressing data recording, data availability and reliability as well as possible management measures to reduce bycatch of these species.

On behalf of the Minister of Fisheries and Agriculture

Jóhann Guðmundsson
Director General Department of Fisheries and Aquaculture

**Discards**

Since 1996, discarding in Icelandic fisheries is prohibited and subject to penalty[331] (ISK 400,000 to 8,000,000 or about EUR 3,000 to 60,000). In a practical sense, if vessels do not have sufficient quota to cover the species they have caught they are required to attain quota through the quota transfer system. Consequently if vessels do not have sufficient catch quotas for their probable catches they must suspend all fishing activities; this means that under the ITQ system, the discard policy primarily affects the composition of landings and not the aggregate volume. Discards are not accounted for in the stock assessment process. This has been discussed earlier in Section 1.

**VS catches to allow flexibility in discard ban measures**

One feature of the discard ban is the 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).

Article 9 Regulation no. 698/2012 on fishing for commercial fishing year 2012/2013 states that:
"The master may decide that part of the catch is not calculated on the vessel's catch quota. This authorization is limited to 0.5% of pelagic catch and 5% of other catches by the relevant vessels during the fishing year and is subject to the following conditions:
a. The catch is kept separately from the other catch of the ship and it is weighed and registered separately.
b. The catch is sold at auction in an approved auction market for seafood, and its proceeds flow to the Fisheries Fund, cf. law no. 37/1992, with subsequent amendments.
c. The license is divided into four three-month periods during the fishing year. Unused sources may not be transferred between the periods[332].

On sale of VS catches in public fish markets, 20% of the revenue generated is paid to the vessel with the remaining 80% going to a designated research and development fund (the VS fund, under the auspices of the Ministry). A maximum of 20% return on VS catches means that there are limited incentives for fishermen to land such catches. However, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, and preventing discard. VS catches of cod in 2018/2019 totalled 1,248 t [333].

**Fisheries effects on the habitat (by bottom gears)**

The Icelandic groundfish fishery is multispecies in nature with vessels simultaneously targeting numerous species; as such the effects of bottom contact fishing gears are not separable by species and thus are generally attributed to the fishery as a whole rather than to any species in particular. Interactions between fishing gears and the seabed are highly dependent on gear type with towed bottom gears such as demersal trawls and dredges having a greater impact than static gear such as longlines, set nets or pots. Of the total catch of cod by the Icelandic fleet in recent years, the following gear types were responsible for:

[331] Act concerning the Treatment of Commercial Marine Stocks No. 57-1996: https://www.althingi.is/altext/pdf/131/s/0982.pdf
[332] http://www.fiskistofa.is/veidar/aflastada/vs-afli/vsafli.jsp
[333] http://www.fiskistofa.is/veidar/aflastada/vs-afli/vsafli.jsp

| Icelandic cod total catches[334] | | Bottom Trawl | Longline | Gillnet | Demersal seine | Handlines/jiggers |
|---|---|---|---|---|---|---|
| 2017/18 | 270,217 t | 51% [335] | 30% | 7% | 6% | 6% |
| 2016/17 | 237,644 t | 49% [336] | 32% | 7% | 6% | 6% |
| 2015/16 | 251,000 t | 45% [337] | 35% | 8% | 6% | 6% |
| **Average** | | **48.3%** | **32.3%** | **7.3%** | **6%** | **6%** |

Potential habitat effects of the Icelandic fishery can be attributed mainly to bottom trawling.

**Trawling distribution and effort[338]**

**Main habitat type in the Icelandic marine ecosystem**

Different oceanic conditions north and south of Iceland have a major impact on the distribution patterns of marine habitats, and the Greenland-Scotland Ridge acts as a barrier to the spread of species. The main substrates around Iceland are clay, sand, gravel and lava. These are shown in the figure below.

[334] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf
[335] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf
[336] http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cod.27.5a.pdf
[337] http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cod.27.5a.pdf
[338] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/IcelandicWatersEcoregion_EcosystemOverview.pdf

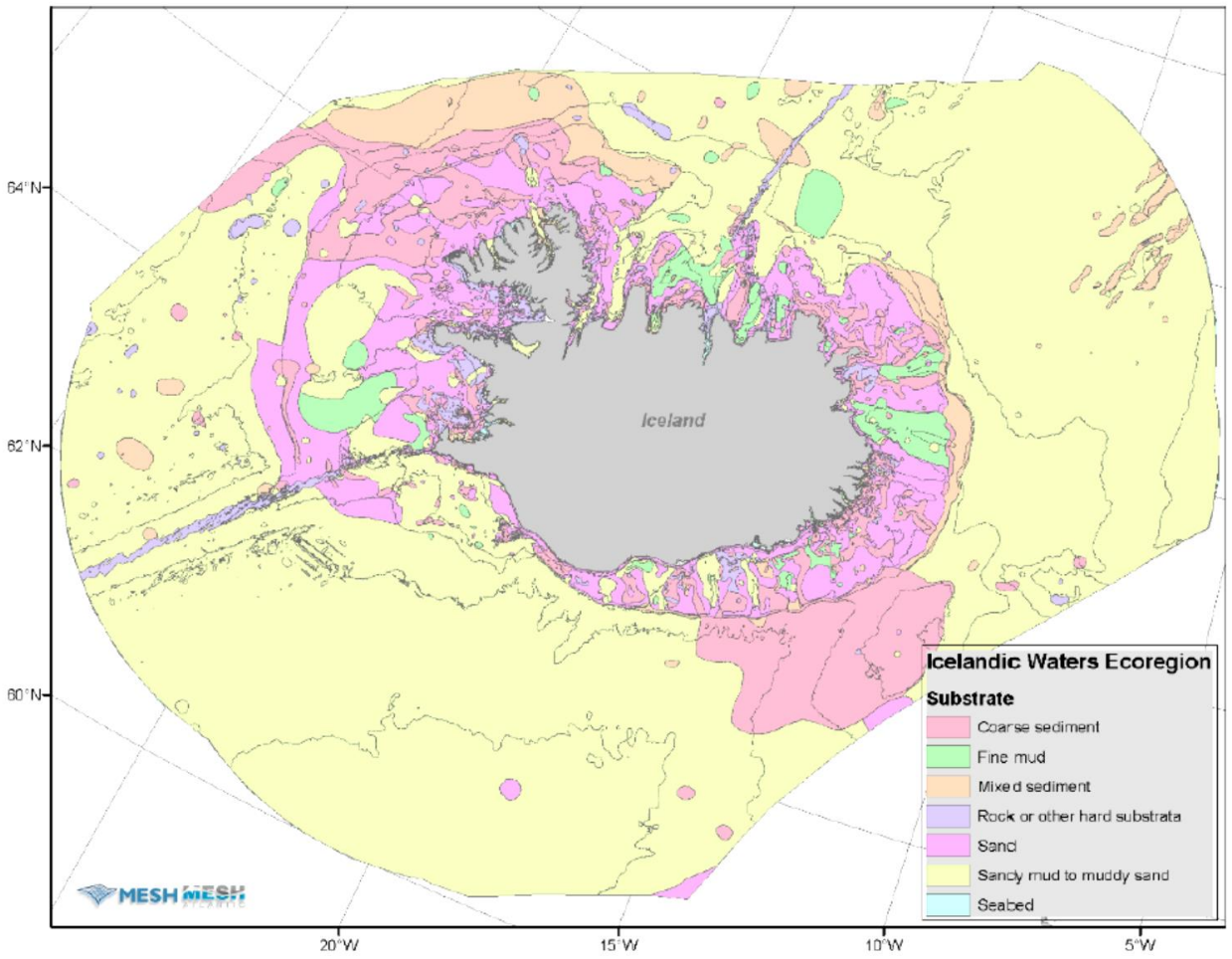



**Figure 60.** Major substrates in the Icelandic Waters ecoregion (compiled by EMODnet Seabed Habitats; www.emodnet-seabedhabitats.eu).

**Trawl Spatial Distribution and Effort in Icelandic waters by gear type and region (i.e. North/South, Shelf/Deep)**

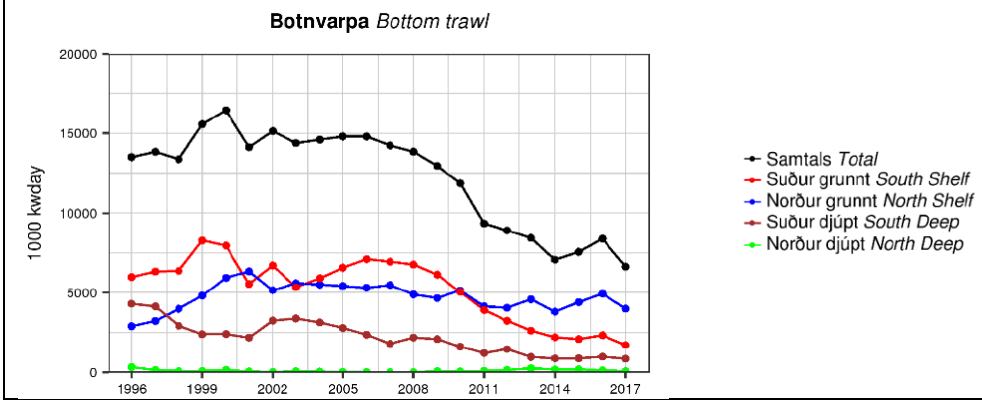


**Figure 61.** Annual total bottom-trawl fishing effort (1000 kW days) based on logbooks from trawl fisheries targeting demersal fish in the Icelandic ecoregion from 1996 to 2017. Bottom trawl effort in 2017 is about 50% of what it was in 2007.

**Bottom Trawl footprint in Iceland**

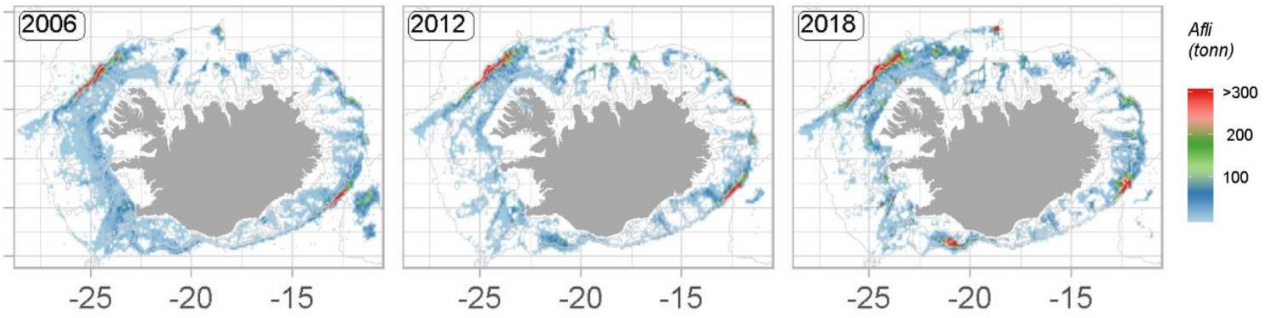



**Figure 62.** Spatial distribution of bottom-trawl effort days based on logbooks from bottom trawl fisheries in 2006, 2012 and 2018[339]. Note the white patches inshore indicating permanent trawl closures.

**Effects of bottom trawling**

The main abrasive pressure in the Icelandic waters ecoregion is caused by mobile bottom-fishing gears targeting demersal fish, shrimp, and Norway lobster *Nephrops norvegicus*.

The 2018 ICES Report on the Icelandic Ecoregion Ecosystem[340] highlights that based on analysis of electronic logbook data a total area of about 79 000 km$^2$ was fished with towed bottom-fishing gears in 2013 in Iceland, composing 10% of the ecoregion. 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, although limited. The decrease in fishing effort varied locally, with decreases mainly being noted on the southern shelf and at typical shrimp trawling grounds on the northern shelf.

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. Effects on large emergent epifauna are more significant than on smaller encrusting organisms with areas subject to regular hydrodynamic disturbance, such as winter storms in shallower areas also being more naturally resilient to fishing disturbance.

Based on recent data from the MFRI Ecosystem Overview report[341] we can see that bottom trawl effort has decreased from 2013 (just above 150 thous. hours) to 2017 (to about 125 thous. hours) by about 17%. Although

[339] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf
[340] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/Ecosystem_overview-Icelandic_Waters_ecoregion.pdf
[341] https://www.hafogvatn.is/static/files/Veidiradgjof/vistkerfi.pdf

bottom trawl effort does not necessarily equate to trawled area it is possible that an area less than 10% of the Iceland ecoregion was disturbed by bottom trawls in 2017.

During the Nov. 2018 site visits HB Grandi stated that all of their trawlers (4 wetfish and 2 freezer trawlers), as well other trawlers in the industry[342], use pelagic flying doors because they do not drag on the seafloor, save on fuel costs while decrease gear damage. Common use of "T90 bottom trawls" (30% lesser net) with pelagic doors (not dragged on the bottom) in Iceland[343], has resulted in considerable fuel savings without sacrificing fishing efficiency. Bottom trawlers in Iceland are also reported to use rock hoppers.

Commonly encountered habitats in the Icelandic ecoregion tend to be hard ground, varying from sandy mud to gravel and cobbled areas (Ragnarsson & Steingrímsson, 2003[344]). These areas tend to be resilient, more dynamic areas and it is unlikely that bottom trawl gear will reduce their structure and function to the point where there would be serious irreversible harm, as they have been fished for many years and still provide productive fish stocks over the long-term.
In cooperation with researchers at MFRI, trawl fisheries are actively contributing to benthos mapping programmes by recording all benthos bycatch to species level where relevant.

The impact of seine net fishery (Scottish seining, fly-dragging) was examined by Thorarinsdóttir et al. ( 2010)[345] in Skagafjörður, Iceland, by comparing benthic communities in areas open to fishing to an area where no fishing is allowed but otherwise comparable. Data obtained from analysis of grab samples revealed no significant differences in the species composition between areas although the abundance of benthic organisms tended to be greater within the closed area than in the fished area. Danish seines can only be used in areas of relatively smooth bottom, which are themselves not likely to be vulnerable to fishing gear impacts anyhow, indicating that Danish seine gear has a small to negligible effects on benthic habitats.

**Protection of Vulnerable Marine Ecosystems (VMEs)**
It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; sponge communities, coldwater corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Large areas within the Icelandic EEZ are closed, either temporarily or permanently, to fishing for a variety of reasons; these include the protection of juveniles, spawning fish and VMEs. Cumulatively, a large portion of Icelandic shelf area within which fishing activities occur is closed to bottom trawling. Furthermore, not all the fishable shelf areas outside closed areas are trawlable, as some parts of the seabed are unsuitable for trawl gear.

**Closures**
The use of bottom trawl and pelagic trawl is not permitted inside a 12-mile limit measured from low-water line along the northern coast of Iceland. Similar restrictions are implemented elsewhere based on engine size and size of vessels[346]. Off Northwest and North coast of Iceland, fishing by bottom trawl, midwater trawl and Danish seine is not allowed within 12 miles from a line drawn across the mouth of fjords and bays. Off the East, South and West coast, bottom trawling is permitted according to vessel size and engine power, with larger vessels

[342] http://www.hampidjan.is/news/news-article/clear-advantages-of-flying-doors
[343] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/
[344] https://academic.oup.com/icesjms/article/60/6/1200/652072
[345] https://www.hafogvatn.is/static/research/files/fjolrit-151pdf
[346] https://www.government.is/news/article/?newsid=e747dac7-fb88-11e7-9423-005056bc4d74

(over 42 m) not having access within 12 miles, but the smaller vessels (less than 29 m) in some areas up to 4 miles. These openings are both area - and time based[347]. The ships are divided into 3 groups depending on their length and power.

These closures, in particular those of a permanent nature, provide wider ecological benefits over and above their intended fisheries management objective by offering *de facto* protection from fishing activity to other elements of the marine environment. Please see the map below indicating most of the current closures in Icelandic waters.

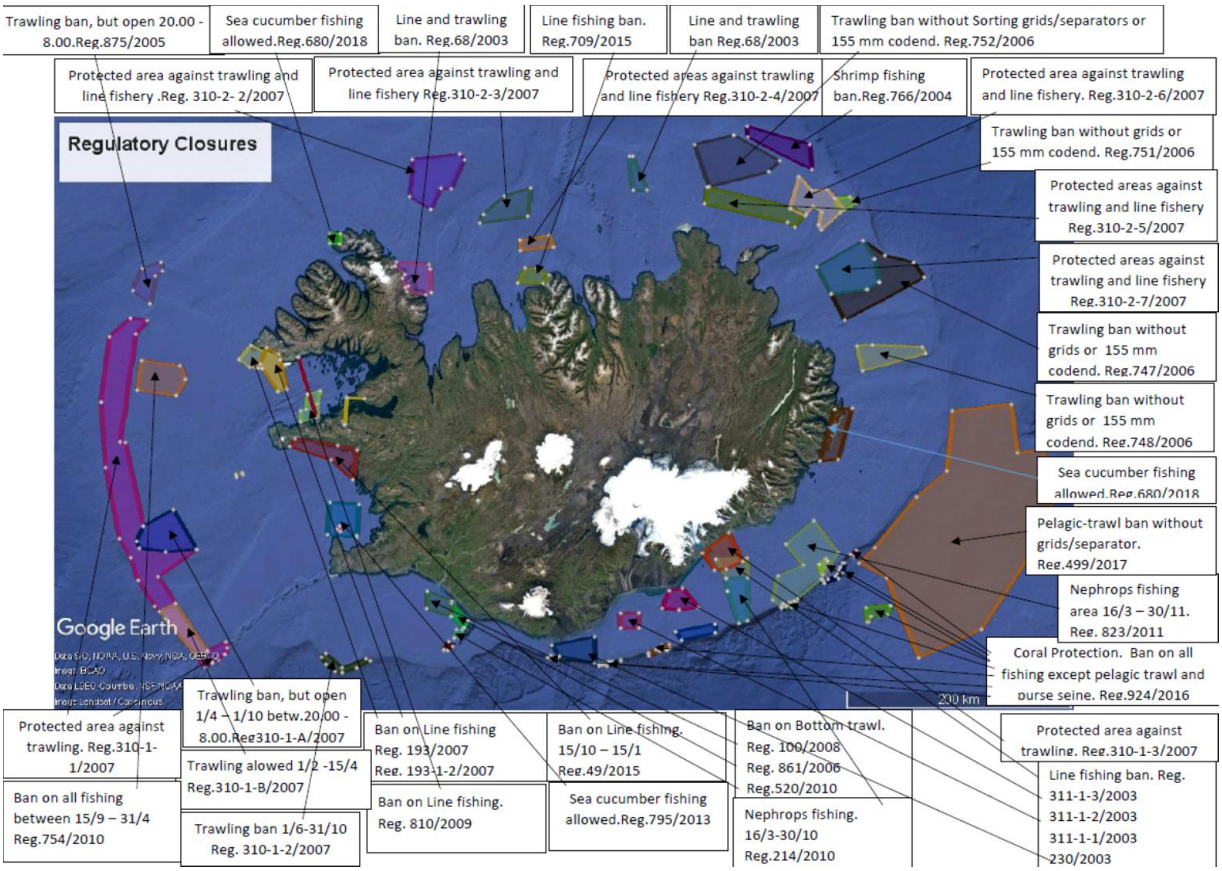



**Figure 63.** Regulatory Closures in Icelandic waters as of November 2018. The long purple trawl closures in the South West of Iceland were originally designed to protect golden redfish juveniles, and were originally set up in the early 1990s[348].

[347] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/domsmalaraduneyti/nr/1154

[348] https://www.hafogvatn.is/static/research/files/fjolrit-133pdf

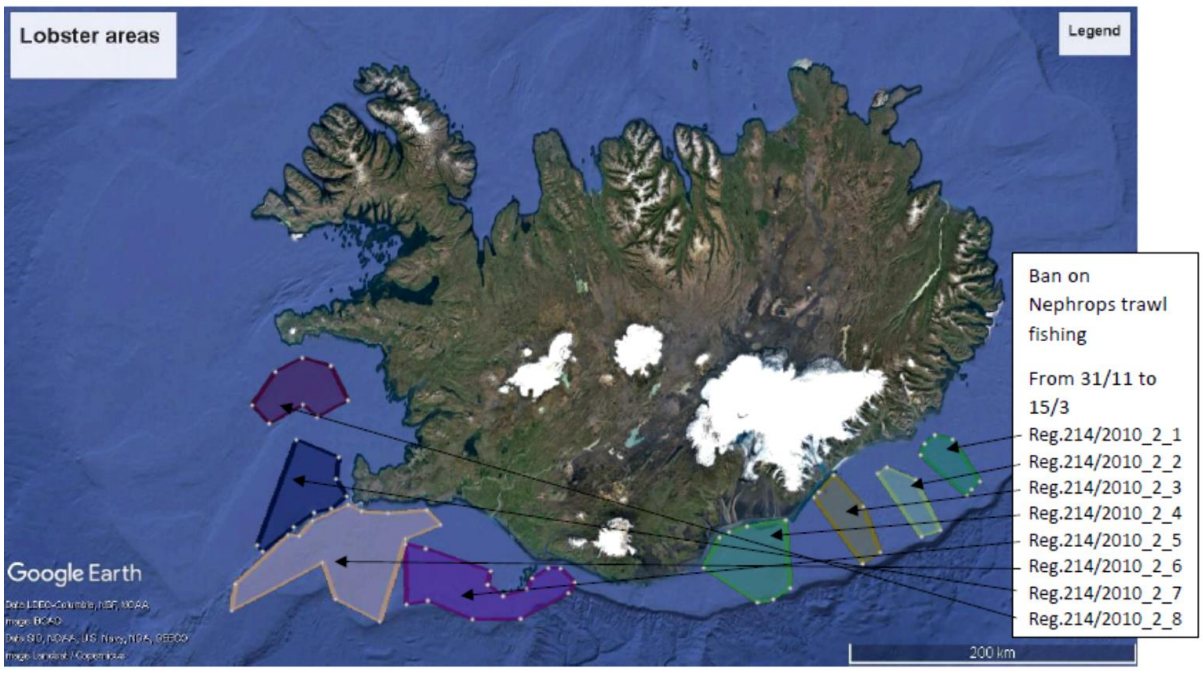



**Figure 64.** Temporary Nephrops fishing Closures in Icelandic waters as of November 2018.

**Benthic organisms**

The database of the BIOICE programme provides information on the spatial distribution of benthic organisms within the Icelandic territorial waters based on samples collected from 579 locations, including horny corals (*Gorgonacea)* and seapens (*Pennatulacea*) that are considered sensitive to fishing[349].

**Seabed Mapping**

In a long-term mapping project, albeit opportunistic in nature, the MFRI collects data to describe habitat types and ecosystems of the sea-floor around Iceland, including VME's. The data is collected with underwater cameras with high spatial accuracy. Benthic fauna and sediment are also recorded. Vulnerable habitats according to FAO, OSPAR and ICES, are identified when observed (MFRI, site visits Nov. 2018, pers. comm).

Seabed mapping is a key aspect of this policy and is the remit of the MFRI. During the summer of 2017 a 9-day habitat mapping cruise was conducted including a total 61 dives in four areas[350]. The combination of data relating to the distribution of sensitive habitats and fishing effort is important in order to predict species and habitats at risk from fishing activity. MFRI is currently participating in the Norwegian Institute of Marine Research-led NovasArc project, together with the Faroe Marine Research Institute[351]. The three year project running from 2016-2018 aims to map the distribution of VMEs in Arctic and Sub-Arctic waters including those around Iceland. It also aims to map the distribution of commercial fisheries and other human activities and

349 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/NWWG/Sec%2007%20Overview%20on%20Ecosystem,%20fisheries%20and%20their%20management%20in%20Icelandic%20waters.pdf

350 https://hafsbotninn.wordpress.com

351 http://novasarc.hafogvatn.is/

identify possible conflict areas. The most recent meeting was in Tórshavn, Faroes on November 20-24, 2017. The key task for the workshop was to develop and test the analysis chain for the VME/impact analysis including:

- Making a habitat suitability model for one or two VMEs based on observations of occurrence and available abiotic setting e.g. temperature, substratum, current, topography. An example of the model output is shown in the figure below.
- Produce a VME distribution map for the larger study area based on the habitat suitability model and environmental settings.
- Produce fishing pressure map based on trawling data for the larger area.
- Making impact estimates based on GIS analysis of overlap between the VME distribution and fishing intensity.

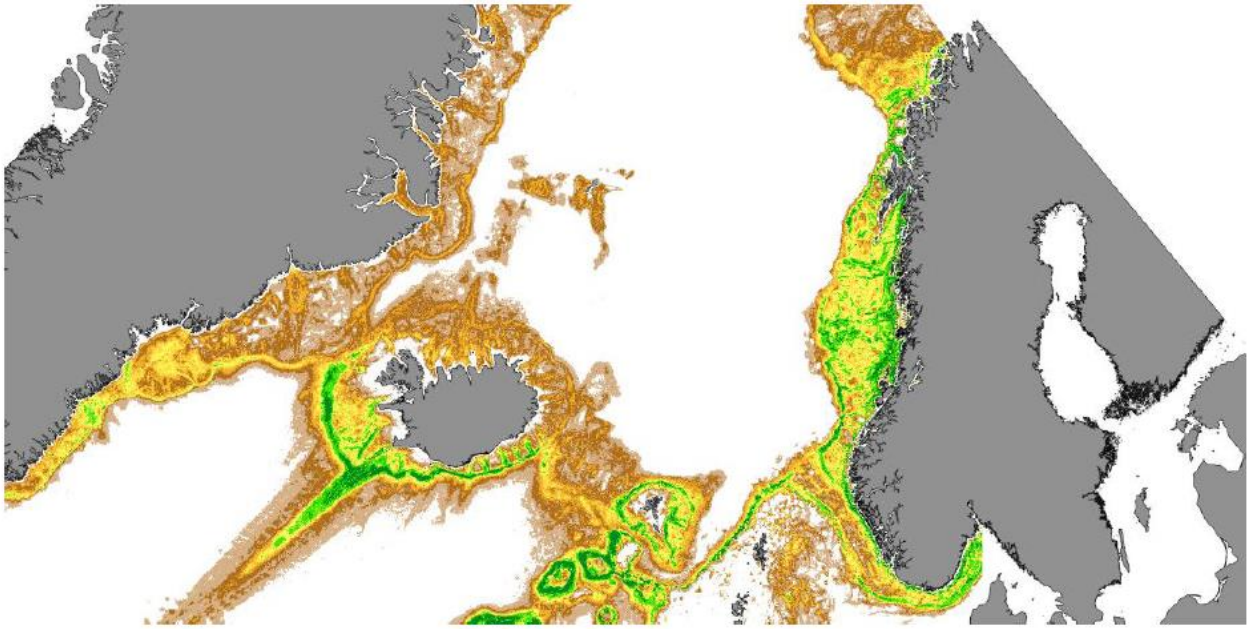


**Figure 65.** Distribution of the VME shallow sea pen based on first test run of the habitat suitability model. Green is 1 and white is zero probability of occurrence (Source: Report of NovasArc workshop, Tórshavn, Faroes, November 20-24, 2017[352]).

**Benthos recording in annual MFRI Survey**

Benthos (e.g. sponges, starfish, jellyfish, crabs, tunicates, bivalves, etc..) bycatch is recorded in the annual MFRI ground fish survey by identifying the species, measuring weight to track biodiversity and biomass over time. Further information on VMEs management is provided below.

**Sponge communities**

Aggregation of large sponges (ostur or sponge grounds) is known to occur off Iceland (Klittgard and Tendal 2004). North of Iceland, particularly in the Denmark Strait, ostur was found at several locations at depths of 300-750 m, which some are classified as sponge grounds. Significant ostur and sponge grounds occur off south Iceland, especially around the Reykjanes Ridge[353].

[352] http://novasarc.hafogvatn.is/docs/NovasArc_report_workshop_4.pdf

[353] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2005/may/Iceland%20and%20East%20Greenland.pdf

Bycatch of sponges are recorded during annual groundfish surveys allowing managers to estimate the distribution of mass sponge occurrences. Deep-sea sponges fall within the VME habitat category. Suggestions for conservation of deep-sea sponge aggregations by the MFRI will be based on research measurements. Likely areas will be mapped and evaluated prior to conservation suggestions (MFRI, Nov. 2018 site visits, pers. comm.).

Currently, there are no strategic conservation plans in place for sponges; however, there are a number of different closures which while not designed specifically for the protection of sponge communities, provide *de facto* protection for benthic organisms including sponges. These include:

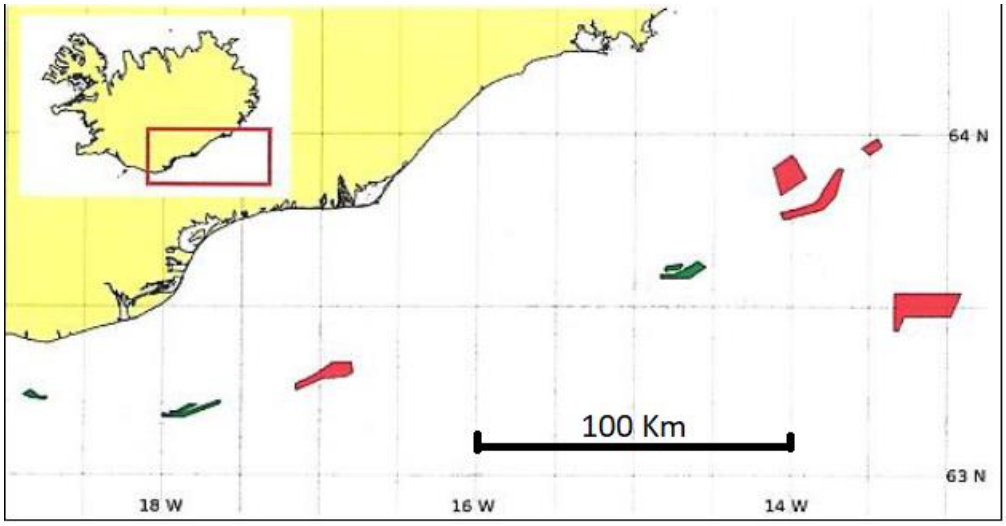
1. Closure of coastal areas within 4 – 12 nm to bottom trawls.
2. Several permanent regulatory fisheries closures outside of 12nm in which otter trawls, and in most cases long-lines, are banned.
3. Cold water coral protection areas, some of which have considerable abundance of sponges.

**Sea-pen fields**

In some locations with soft sediments sea pens can be found in high densities. Norway lobster *Nephrops norvegicus*, squat lobster *Munida sarsi* and sea cucumber *Stichopus tremulus* are commonly associated with them. Like sponges there are no strategic conservation plans in place for sea-pen communities; however, they derive de facto protection from other closures[354].

**Cold water coral communities**

The coral water coral closures protect *Lophelia pertusa,* a species of cold-water coral which is extremely slow growing, associated with diverse communities and may be harmed by destructive fishing practices. In 2004 a research project mapped coral areas off Iceland and as a result 10 areas in to the southeast of Iceland were permanently closed to fishing.




[354] http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WGDEC/wgdec_2017.pdf

**Figure 66.** 10 coral closures in South East Iceland, current as of November 2018. Maps can be viewed by downloading Google Earth and clicking on the following kml file produced by the Directorate of Fisheries http://uv.fiskistofa.is/uv.kml .

**Hydrothermal vent areas**

There are two known hydrothermal vent areas with series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island (see map below) and are fully protected by environmental law nr 249/2001 and 510/2007[355]. There are additional known hydrothermal vents in deeper waters to north, south and southwest of Iceland. These are in more remote areas and have less surface structure and are not been considered threatened by fishing activities.


**Figure 67.** Coordinates and location of protected natural resources (i.e. hydrothermal vent) at Arnarnesstrýtur in Eyjafjörður north of the Arnarnes river[356].

Iceland is a Contracting Party to the North East Atlantic Fisheries Commission which in 2014 adopted Recommendation 19, amended in 2015, requiring vessels to move 2 nautical miles away from trawl tracks when encountering "the presence of more than 30 kg of live coral and/or 400 kg of live sponge of VME indicators"[357]. Icelandic vessels outside of the Icelandic EEZ are meant to abide by commonly accepted move-on rules when encountering VMEs, however these are currently informal, and not part of a formal code of conducts or regulations, partly due to difficulties in monitoring. A number of practical steps encourage avoidance of VMEs, including local knowledge, gear damage avoidance, buffer zones around closed areas avoiding straying, contributing towards habitat mapping programmes to improve knowledge on distribution of VME indicator species and concentrations, considerable reduction of trawl gear effort since the early 1990s to fewer locations, no new fishing areas opened up.

[355] https://www.ust.is/library/Skrar/Einstaklingar/Fridlyst-svaedi/Auglysingar/hverastrytur_eyjafirdi_249_2001.pdf
[356] https://www.ust.is/library/Skrar/Einstaklingar/Fridlyst-svaedi/Auglysingar/Hverastrytur_Arnarnesnofum_kort.pdf
[357] https://www.neafc.org/system/files/Rec.19-2014_as_amended_by_09_2015_and_10_2018_fulltext-and-map.pdf

| | | |
|---|---|---|
| **Consistency of management of the fishery's ecosystem impacts with the precautionary approach.**<br>As outlined above the most probable adverse impacts of the Icelandic cod fishery are considered and those impacts likely to have serious consequences (e.g. bycatch, ETP species interaction, habitats effects, and wider ecosystem interactions) are addressed either by an immediate management response or further analysis of the identified risk. Consideration of the adverse impacts of the fishery on the ecosystem and resulting management actions are demonstrably consistent with the precautionary approach. We also note NC#2 raised against this requirement. | | |
| **References:** | See footnotes. | |
| **Non-Conformance Number (if relevant)** | | **#2** |

### 1.1.3.6. Clause 3.1.2.

Those impacts that are likely to have serious consequences shall be addressed. This may take the form of an immediate management response or further analysis of the identified risk.[358]

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Ecosystem impacts that are likely to have serious consequence include bycatch issues, ETP species interactions and habitat effects of the fishery. Resulting management actions or further analysis of identified risks are demonstrably consistent with the precautionary approach.**

**Evidence:**

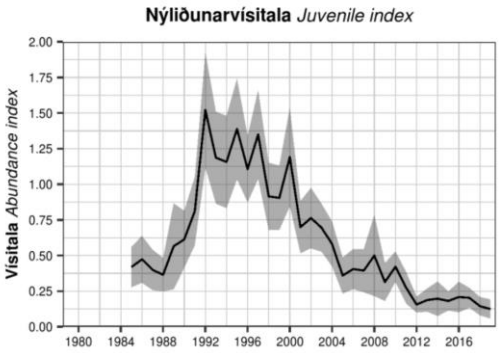
Based on the information and analysis provided in Clause 3.1.1, above, ecosystem impacts that are likely to have serious consequence include bycatch issues, ETP species interactions and habitat effects of the fishery. Key issues and management responses to those are summarised below.

**Bycatch issues**

There are a number of species at potential risk of bycatch from the cod fishery for which immediate management responses or further analysis of the identified risk are being effected. These are summarised below.

**HLÝRI – SPOTTED WOLFFISH (*Anarhichas minor*)[359]**

Figure from the June 2019 MFRI Advice:

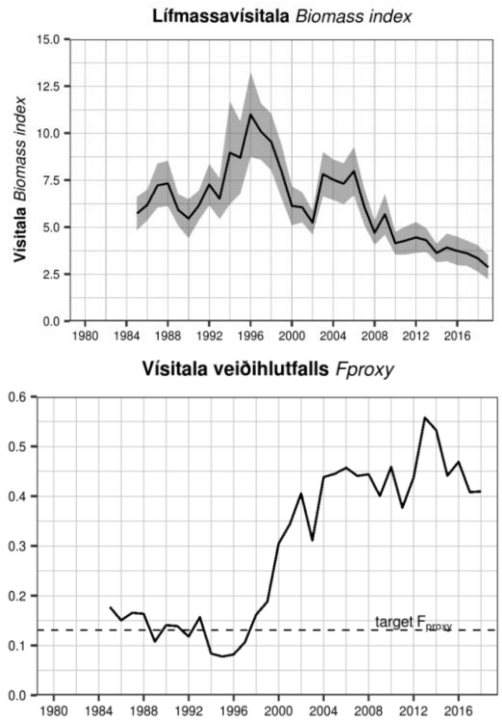



Around 98% of Spotted wolffish (*Anarhichas minor*) is currently caught as bycatch in the trawl and longline fisheries that target cod and is mainly found at the northwest and north parts of the continental shelf of Iceland, at sandy or muddy substrate and depths of 100-400 meters, in fishing ground overlapping with those of cod. From 2002, the catch on longline has been increasing relative to that taken in demersal trawl. In 2018, longline catch was around 53% of the total catch.

Since 2012 catches have been consistently above advice/recommended TAC. Spotted wolffish was included in the ITQ system in 2018 and the TAC in 2018/2019 was set as per recommended TAC of 1001 t[2]. Preliminary catches in 2018/19 have exceeded the TAC (1200 t caught by August 7th 2019) based on Fiskistofa records[3]. We note, these values may be subject to revision.

[358] 2005/2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.
[359] https://www.hafogvatn.is/static/extras/images/13-SpottedWolffish%20(1)1141515.pdf
[2] https://www.hafogvatn.is/static/extras/images/13-SpottedWolffish_TR1141496.pdf
[3] http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/




| Year | Advice/ Recommended TAC | National TAC | Spotted Wolffish Catches | Total catches as a % of advice |
|---|---|---|---|---|
| 12/13 | 900 | | 2,042 | 227% |
| 13/14 | 900 | | 2,250 | 250% |
| 14/15 | 900 | | 1,655 | 184% |
| 15/16 | 900 | | 1,913 | 213% |
| 16/17 | 1128 | | 1,587 | 141% |
| 17/18 | 1080 | | 1,528 | 141% |
| 18/19 | 1001 | 1,001 | 1,234 | 123% |
| 19/20 | 375 | 375 | | |

In a request for clarification, the Ministry confirmed that spotted wolffish is caught with other species in the mixed fishery and is therefore very difficult to manage. They also explained that in the fishing year (2019/2020) the TAC is extremely small so there might be additional difficulties in maintaining the species within TAC.

In their 2019 Advice, MFRI advised that when the precautionary approach is applied, catches in the fishing year 2019/2020 should be no more than 375 tonnes. Biomass and juvenile indices are at their lowest levels in the time series. Fproxy has been high since 2000.

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

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

It is not clear to what degree management has been successful at reducing harvest for this stock since catches in 2018/19

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

| | |
|---|---|
| | appear to have exceeded the TAC by over 20%. The same or perhaps a bigger issue remains for the reduced 2019/2020 quota and the related effects on the stock. The cod fishery overlaps in terms of fishing gears, fishing grounds and depths with spotted wolffish catch and is therefore considered to have an effect on this stock, itself a component of the Iceland marine ecosystem. |

**ETP species issues**

There are a number of ETP species at potential risk of interaction from the cod fishery for which immediate management responses or further analysis of the identified risk are being carried out. These are summarised below.

**Atlantic halibut**

Atlantic halibut (*Hippoglossus hippoglossus*) is classified as Endangered on the IUCN Red list[360]. A committee established in 2010 by the minister of fisheries due to the poor state of the Atlantic halibut stock in Iceland, concluded that the most effective way to rebuild the stock would be to ban all targeted fishing. In 2012, a regulation was issued to ban all targeted fishing for Atlantic halibut[361] and stipulating that all viable halibut in other fisheries must be released. In 2019, MFRI's advice is that these regulations remain in effect[362].

Annual landings of Atlantic halibut were 36–119 tonnes in 2012–2018, which are the lowest landings since the beginning of the fishery. The decrease is due to management decisions.

**Ban on fishing for spiny dogfish, Porbeagle sharks and Basking shark.**

Regulation 456/2017 states that there is a ban on fishing for Porbeagle sharks, Basking shark and spiny dogfish. Any incidental catches of these species are to be landed and sold on an approved auction market for marine products according to the provisions of Act no. 37/1992, on a special fee for illegal fishing, with subsequent amendments. [363]

Catches of spiny dogfish and porbeagle sharks have been very low in recent years. Catches of Greenland sharks have been 10 t in the 2017/18 season.

**Common skate**

No TAC is available for this species because there is no directed fishery for it. It is only caught as bycatch in mainly longline, bottom trawl and Danish seine gear. Total catch of skate in Icelandic waters in 2017/18 was 139 tonnes, very close to the 10 years average. The current management response of the MFRI is to monitor the incidences of capture and distribution of skate during the spring bottom trawl survey as they have been doing since the survey began in 1985. In addition, catches in commercial fisheries will continue to be collected and the MFRI will monitor whether significant changes either the survey results or the level of landed catches occur. Numbers in the spring survey have been increasing steadily since the 1990s potentially showing some

[360] https://www.iucnredlist.org/species/10097/3162182
[361] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302

[362] https://www.hafogvatn.is/static/extras/images/21-AtlanticHalibut1141466.pdf
[363] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017

signs of improvement (albeit with a high degree of uncertainty). Dipturus spp. abundance in EU Waters has also shown some increases in recent surveys.

Given the uncertainties with this species and its management, a new Recommendation (#2) has been issued for client consideration.

**Issues with recording of marine mammal and seabird bycatch and relative management actions**

**E-logbook app modifications**

A smartphone app is in development by the Directorate of Fisheries, to make reporting and identification of marine mammal and seabird bycatch easier for operators in the fishery. During the 2018 site visits the Directorate reported that this app prioritises the need for recording marine mammals and seabirds interactions/bycatch before fish catches are submitted, to enable more consistent and reliable reporting. The app appears to be ready for implementation but there is a need to change current legislation to ensure it can be nested within legal requirements.

**Marine mammal bycatch**

**Harbour porpoises (*Phocoena phocoena*)**

Harbour porpoises are classified as Least Concern in the IUCN Red List[364] (population trend unknown, last assessed in 2008). They are also classified as Least Concern in the Icelandic National Redlist (based on a 2016 assessment)[365]. Annual estimates of harbour porpoise by-catch have decreased in recent years as gillnet effort has decreased (see table below), from a high of 7,300 animals in 2003 to about 1600 animals in 2009–2013[366] and down to about 750 animals in 2014-2015. There was an increase in harbour porpoise by-catch in cod gillnets in 2016. The rate is four times higher compared to 2015 (with the same amount of observer effort), suggesting that harbour porpoise density on the fishing grounds might be changing[367].

In 2016 an aerial survey was performed. Despite the poor coverage in it, the uncorrected harbour porpoise population estimate is at least double that of all previous estimates other than that from 2007, when a specialist harbour porpoise observer was employed and all known biases were corrected. Availability bias is likely substantial for this species but dive profile data from the survey area are lacking[368]. This data, although not definitive at this point, appears to imply that the harbour porpoise is increasing and as such, may not be below biological limits.

Information from the Report of the Joint IMR/NAMMCO International Workshop on the Status of Harbour Porpoises in the North Atlantic (December 3rd - 7th 2018, Tromsø, Norway)[369] reported abundance information for harbour porpoise in Iceland showing bycatch information and an increase in abundance (see figure 56a). The conclusion of the NAMMCO assessment is that the population in the Icelandic area seems to be recovering. Furthermore, based on the model run outputs, the PBR for 2018 is around 3500 porpoises.

[364] https://www.iucnredlist.org/species/17027/6734992
[365] https://www.ni.is/node/27406
[366] 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
[367] https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf
[368] https://nammco.no/wp-content/uploads/2018/09/report_aewg_2018_final.pdf
[369] https://nammco.no/wp-content/uploads/2019/02/final-report_hpws_2019.pdf#page=34&zoom=100,64,350

Collaboration of the MFRI with the University of Potsdam on harbour porpoise genetic research is ongoing (Lah et al. 2016). Among the objectives of this study is estimation of population size based on close kin analysis[370]. In 2017 fishermen for the first time received a payment for each harbour porpoise DNA tissue sample that they send in to the MFRI, and this is clearly resulting in an increase in samples and in the recording of by-catch. Around 200 samples have been received per year this way in addition to the samples from bycaught porpoises in the gillnet survey around Iceland in the spring and occasional samples from stranded animals. Preliminary results were presented to a workshop on harbour porpoises in November 2018.

**Harbour seals**

In 1980, the abundance of harbour seals was estimated at around 33,000 animals but the population declined rapidly until 1989 to around 15,000 animals. The 2018 harbour seal census resulted in a population estimated of 9,434 animals (95% confidence intervals of = 6,149-12,726). The 2019 MFRI Advice indicates that current population size is 72% smaller than the first abundance estimate from 1980 and the population is 21% under the management objective of 12,000 animals.[371]

Between 2014 and 2018, it has been estimated that annually, 15 harbour seals were bycaught in cod gillnet fisheries (CV=1.02) and 17 harbour seals in bottom trawls (CV=1.00) (Marine and Freshwater Institute, in prep.)[372]. Based on these most recent estimates, 97.7% of the harbour seal bycatch can be attributed to the lumpfish fishery and the reminder 1.07% to the cod gillnet fishery and 1.22% to the bottom trawl fishery. In the bottom trawl fishery, cod made up less than 50% of total catches in the past 3 seasons, hence this fishery is responsible for about 0.6% of the harbour seal bottom trawl bycatch. Current harbour seal bycatch is for the most part dependent upon lumpsucker fishery effort[373].

A full population survey was conducted during the moulting period in 2018 and the data analysis is currently ongoing. The current aim is to conduct aerial population censuses every second year while the population is under the target level. The MFRI advice to the Ministry has been: “that direct hunt should be prevented and that actions must be taken to reduce by-catch of seals in commercial fisheries. MFRI also advices that a hunting management system should be initiated, and that reporting of all seal hunt should be mandatory.”

**Harp Seals**

The harp seal (*Pagophilus groenlandicus*) population is found in three separate populations, each of which uses a specific breeding site. The western North Atlantic stock, which is the largest, is located off eastern Canada. A second stock breeds on the "West Ice" off eastern Greenland, which contributes to Icelandic individuals. The cod gillnet fleet appears to have some interactions with harp seals. 92 seals were caught in 2014, 212 in 2015 and 144 in 2016. There does not appear to be much information available specific to Iceland, but the species is considered Least Concern in the IUCN Red List with increasing population at 4.5 million individuals, based on a 2015 assessment[374].

[370] https://nammco.no/wp-content/uploads/2019/04/2018-iceland_progress_report_final2.pdf
[371] https://www.hafogvatn.is/static/extras/images/landselur_191145061.pdf
[372] https://www.hafogvatn.is/static/extras/images/landselur_191145061.pdf
[373] https://www.hafogvatn.is/static/research/files/hv2017-009pdf
[374] https://www.iucnredlist.org/species/41671/45231087#conservation-actions

**Ringed and hooded seals**

The interaction between cod gillnet fisheries and ringed seals and hooded seals appear to be quite limited. 38 ringed seals (*Pusa hispida*) were caught in 2014 (none in 2015 and 2016), while 47 hooded seals (*Cystophora cristata*) where caught in 2015 (none in 2014 and 2016). Ringed seals are considered Least Concern[375] in the IUCN Red List (as well as being marked as non-resident or breeding in Iceland), while hooded seals are considered Vulnerable in the IUCN Red List[376] (last assessed in 2015). Hooded seals are native and resident to Canada, Greenland and Iceland, their current estimated population is 340,000 mature individuals and their population trend is unknown.

The ICES/NAFO/NAMMCO working group on harp and hooded seals (WGHARP) will meet in Tromsø, Norway, 2-6 September 2019. New data from all populations is available and the group will do assessments of status and harvest potentials[377].

**Icelandic Committee for Consultation on Responsible Management of Living Marine Resources**

In response to the recently recognized issue of seabird and marine mammal bycatch in cod and lumpfish gillnet fisheries the Icelandic ministry of Industry and Innovation has recently created (i.e. November 2018) a Committee for Consultation on Responsible Management of Living Marine Resources to address these matters. The Committee's recommendation to the Ministry include:

- Improvement of information collection and monitoring activities to gather reliable seabird and marine mammal bycatch information from vessel e-logbooks 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;
- Measures to reduce bycatch (e.g. potential spatial/temporal closures at sensitive times such as around seal pupping or bird breeding season); and
- US Marine Mammal Protection Act importing requirements collectively dealt with through improvements in the previous two points (i.e. information gathering and management measures).

**Habitat effects and related improvement measures**

The main abrasive pressure in the Icelandic waters ecoregion is caused by mobile bottom-fishing gears targeting demersal fish, shrimp, and Norway lobster *Nephrops norvegicus*.

The December 2018 ICES Report on the Icelandic Ecoregion Ecosystem[378] highlights that based on analysis of electronic logbook data a total area of about 79 000 km$^2$ was fished with towed bottom-fishing gears in 2013 in Iceland, composing 10% of the ecoregion. 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, although limited. The decrease in fishing effort varied locally, with decreases mainly being noted on the southern shelf and at typical shrimp trawling grounds on the northern shelf. Based on recent data from the

[375] https://www.iucnredlist.org/species/61382318/61382321
[376] https://www.iucnredlist.org/species/6204/45225150
[377] https://nammco.no/wp-content/uploads/2017/01/sc-report-2018_270519_cor250619_rec-walrus.pdf
[378] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/IcelandicWatersEcoregion_EcosystemOverview.pdf

MFRI Ecosystem Overview report[379] it is possible to see that bottom trawl effort has decreased from 2013 (just above 150 thous. hours) to 2017 (to about 125 thous. hours) by about 17%. Although bottom trawl effort does not necessarily equate to trawled area it is possible that an area less than 10% of the Iceland ecoregion was disturbed by bottom trawls in 2017.

During the Nov. 2018 site visits HB Grandi stated that all of their trawlers (4 wetfish and 2 freezer trawlers), as well other trawlers in the industry[380], use pelagic flying doors because they do not drag on the seafloor saving on fuel costs and decrease gear damage. Bottom trawlers in Iceland are also reported to use rock hoppers, as well as flying doors.

**Protection of Vulnerable Marine Ecosystems (VMEs)**

It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; sponge communities, cold-water corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Large areas within the Icelandic EEZ are closed, either temporarily or permanently, to fishing for a variety of reasons; these include the protection of juveniles, spawning fish and VMEs. Cumulatively, a large portion of Icelandic shelf area within which fishing activities occur is closed to bottom trawling (please refer to clause 3.1.1).

Specific to VMEs, there are specific closures in place for cold water coral (i.e. 10 closures) and hydrothermal vents (1 closure) in Icelandic waters.

MFRI is currently participating in the Norwegian Institute of Marine Research-led NovasArc project, together with the Faroe Marine Research Institute[381] to map VMEs in Nordic waters. The three-year project running from 2016-2018 aims to map the distribution of VMEs in Arctic and Sub-Arctic waters including those around Iceland. It also aims to map the distribution of commercial fisheries and other human activities and identify possible conflict areas.

In a long-term mapping project, albeit opportunistic in nature, the MFRI also collects data to describe habitat types and ecosystems of the sea-floor around Iceland, including VME's. The data is collected with underwater cameras with high spatial accuracy. Benthos (e.g. sponges, starfish, jellyfish, crabs, tunicates, bivalves, etc..) bycatch is recorded in the annual MFRI ground fish survey by identifying the species, measuring weight to track biodiversity and biomass over time. Deep-sea sponges fall within the VME habitat category. Suggestions for conservation of deep-sea sponge aggregations by the MFRI will be based on research measurements. Likely areas will be mapped and evaluated prior to conservation suggestions (MFRI, Nov. 2018 site visits, pers. comm.).

| | |
|---|---|
| **References:** | See footnote. |
| **Non-Conformance Number (if relevant)** | **NA** |

[379] https://www.hafogvatn.is/static/files/Veidiradgjof/vistkerfi.pdf
[380] http://www.hampidjan.is/news/news-article/clear-advantages-of-flying-doors
[381] http://novasarc.hafogvatn.is/

### 1.1.4. Clause 3.2. Specific Criteria

#### 1.1.4.1. Clause 3.2.1. Information gathering and advice

##### 1.1.4.1.1. Clause 3.2.1.1.

Information shall be available on fishing gear used in the fishery, including the fishing gears' selectivity and its potential impact on the ecosystem. Stocks of non-target species commonly caught in the fisheries for the stock under consideration may be monitored and their state assessed, as appropriate.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Information is available on the legal specification of fishing gear in the Icelandic groundfish fishery. The primary aim of fishing gear regulations is size selectivity with a secondary aim being species selectivity. Gears are regulated in several ways to regulate both size and species selectivity. The MFRI provide advice for 40 fish stocks in Iceland as well as advice for harvest of marine mammal species (e.g. fin whale and common minke whale). Their most recent advice, which include routine monitoring and assessment efforts is available online.**

**Evidence:**

Information is available on the legal specification of fishing gear in the Icelandic groundfish fishery. The primary aim of fishing gear regulations is size selectivity with a secondary aim being species selectivity. Gears are regulated in several ways to regulate both size and species selectivity.

**Fish size regulations**

The minimum reference size for cod is 55 cm. As discarding is prohibited it is mandatory to land all specimens below these lengths. The minimum reference lengths are used to trigger area closures when catches comprise of more than 25% or greater of fish below the reference size. Where an area closure has been triggered, it remains closed for a minimum of two weeks and is subject to periodic monitoring.

**Mesh size regulations.**

The mesh size in the codend in the Icelandic trawl fishery was increased from 120 mm to 155 mm in 1977. Since 1998 the minimum codend mesh size allowed is 135 mm[382] [383], provided that a so-called Polish cover (a net protecting the belly of the fishing net) is not used. In the Nephrops fishery, the use of two large (200 mm) mesh escape panels is mandatory (*Reg. 543/2002 on mesh sizes and trawls for fishing of demersal species, shrimp and nephrops)*[384].

Mesh size and gear restrictions are mandated to protect both juvenile stocks (trawl mesh size 135 mm with separator panel) and spawners (gill net mesh size 8 inches/203 mm)[385]. Shrimp (Pandalus) fisheries are

[382] https://www.reglugerd.is/reglugerdir/allar/nr/543-2002

[383] https://www.icefish.is/news101/better-redfish-selectivity-with-four-panel-codend

[384] https://www.reglugerd.is/reglugerdir/allar/nr/543-2002

[385] http://www.ices.dk/sites/pub/publication%20reports/forms/marine.aspx?rootfolder=/sites/pub/publication+reports/exper

associated with by-catches of juvenile finfish species. To minimise such by-catch, the use of sorting grids is mandatory.

Additionally, longliners in Iceland use protective devices to shield baited hooks as gears are shot in order to prevent encounters with seabirds. Fishermen tend to use automatic gas guns and night settings (i.e. haul gear at night minimizing seabird interactions). Night setting of longlines is generally done in the winter period but to a lesser degree in the summer when sunlight can be present all day and night in certain areas of Iceland. Bird hunting and exploitation of wild bird is controlled under Regulation 456 issued in 1994[386].

The MRI routinely conducts selectivity experiments to assess the performance of the main fishing gears and to assess ways in which selectivity might be improved.

**T90 trawl net configuration**

T90 is a regular net that has been turned 90° and along with lines on the codend ensures that the mesh stays open during trawling. The effect of trawling on fish size and on different quality parameters of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) was evaluated[387] in 2010 using two trawls in a double rig fitted with a traditional and a T90 codend, respectively. The catch was assessed according to fish size, mortality, external damage, initial white muscle pH and development of rigor mortis. results showed there was no difference between the two types of nets in terms of catch volume, but significantly slightly bigger fish were caught with T90 than with the traditional trawl net ($p<0.05$). Haddock caught with the traditional trawl net had more external injuries related to the trawl gear than haddock caught with the T90 gear ($p<0.05$). The T90 net is being used by HB Grandi trawl vessels, as well as by other trawl vessels in Iceland (Ingimundur Ingim, Fleet Manager, HB Grandi, per. comm.). Furthermore, common use of "T90 bottom trawls" (30% lesser net) with pelagic doors (not dragged on the bottom), has resulted in considerable fuel savings without sacrificing fishing efficiency[388].

**Longline gear capture efficiency**

A study by the Institute of Marine Research, Norway and the MFRI, on the effects of hook and bait sizes on size selectivity and capture efficiency in Icelandic longline fisheries was also published in 2017[389]. The authors looked at the main species caught by longliners in Iceland, cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), tusk (*Brosme brosme*), ling (*Molva molva*) and wolffish (*Anarhichas lupus*). The study showed that increasing hook size lowered capture efficiency for all species, but had only a minor effect on size selectivity. It also demonstrated that hook size and bait size affect the profitability of longline fisheries, in that smaller hooks improve capture efficiency, while larger baits increase catches of large fish and reduce those of undersized fish.

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

t+group+report/acom/2011/nwwg&folderctid=0x0120005daf18eb10daa049bbb066544d790785&view=%7B5c7a53f9-446e-486e-93af-841fc20c1773%7D

[386] https://www.stjornartidindi.is/Advert.aspx?RecordID=8bd54700-a433-413f-83ed-48cd60438a4b

[387] https://link.springer.com/article/10.1007/s12562-010-0254-2

[388] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/

[389] https://www.sciencedirect.com/science/article/abs/pii/S0165783617300541

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

The MFRI provide advice for 44 fish stocks in Iceland[390] as well as advice on harvest and management of different marine mammals (e.g. whales harvest, seals management). Their most recent advice, which include routine monitoring and assessment efforts, is summarised below.

| Type | Advice | Tech report | Tables | Pub.date |
|---|---|---|---|---|
| Cod | advice | tech report | tables | 13. June 2019 |
| Haddock | advice | tech report | tables | 13. June 2019 |
| Saithe | advice | tech report | tables | 13. June 2019 |
| Golden Redfish | advice | tech report | tables | 13. June 2019 |
| Demersal Beaked Redfish | advice | tech report | tables | 13. June 2019 |
| Norway Redfish | advice | tech report | tables | 13. June 2019 |
| Atlantic Halibut | advice | tech report | tables | 13. June 2019 |
| Greenland Halibut | advice | tech report | tables | 13. June 2019 |
| Plaice | advice | tech report | tables | 13. June 2019 |
| Lemon Sole | advice | tech report | tables | 13. June 2019 |
| Witch | advice | tech report | tables | 13. June 2019 |
| Megrim | advice | tech report | tables | 13. June 2019 |
| Dab | advice | tech report | tables | 13. June 2019 |
| Long Rough Dab | advice | tech report | tables | 13. June 2019 |
| Atlantic Wolffish | advice | tech report | tables | 13. June 2019 |
| Spotted Wolffish | advice | tech report | tables | 13. June 2019 |
| Blue Ling | advice | tech report | tables | 13. June 2019 |
| Ling | advice | tech report | tables | 13. June 2019 |
| Tusk | advice | tech report | tables | 13. June 2019 |
| Anglerfish | advice | tech report | tables | 13. June 2019 |
| Whiting | advice | tech report | tables | 13. June 2019 |
| Greater Silver Smelt | advice | tech report | tables | 13. June 2019 |
| Herring | advice | tech report | tables | 13. June 2019 |
| Starry Ray | advice | tech report | tables | 13. June 2019 |
| Northern Shrimp | advice | tech report | | 13. June 2019 |
| Sea Cucumber | advice | tech report | | 13. June 2019 |
| Common Whelk | advice | tech report | tables | 13. June 2019 |
| Sea Urchin | advice | tech report | | 13. June 2019 |
| Icelandic Scallop | advice | tech report | | 13. June 2019 |
| Ocean Quahog | advice | | | 13. June 2019 |
| Lumpfish | advice | tech report | | 29. March 2019 |
| Icelandic Grey Seal | advice | tech report | | 13. March 2019 |
| Norway Lobster | advice | tech report | | 31. January 2019 |

[390] https://www.hafogvatn.is/en/harvesting-advice

| | | | | |
|---|---|---|---|---|
| Northern Shrimp - Snæfellsnes | advice | tech report | | 24. April 2019 |
| Northern Shrimp in Arnarfjörður | advice | tech report | | 30. October 2018 |
| Northern Shrimp in Ísafjarðardjúp | advice | tech report | | 30. October 2018 |
| Northern Shrimp in Húnaflói | advice | tech report | | 30. October 2018 |
| Northern Shrimp in Skagafjörður | advice | tech report | | 30. October 2018 |
| Northern Shrimp in Skjálfandi | advice | tech report | | 30. October 2018 |
| Northern Shrimp in Öxarfjörður | advice | tech report | | 30. October 2018 |
| Norwegian Spring-Spawning Herring | advice | tech report | | 22. October 2018 |
| Capelin | advice | tech report | | 17. October 2018 |
| Mackerel | advice | tech report | | 28. September 2018 |
| Blue Whiting | advice | tech report | | 28. September 2018 |
| Northern Shrimp - Eldey | advice | tech report | | 3. August 2018 |
| Common Minke Whale | advice | tech report | tables | 12. April 2018 |
| Bycatch of seabirds and marine mammals - Lumpsucker gillnets | | tech report | | 11. September 2019 |
| Rockweed | advice | tech report | tables | 29. January 2018 |
| Fin Whale | advice | tech report | tables | 13. June 2017 |
| Harbour Seal | advice | tech report | | 2. July 2019 |

**Additional species/stocks monitored by the Directorate of Fisheries**

The Directorate of Fisheries monitors catches of a larger suite of species (many of them non-target species) including starry ray/thorny skate, common skate, dogfish, Greenland shark, Porbeagle shark, Atlantic halibut, orange roughy, shagreen ray, etc… Records for 65 species can be retrieved on their website.[391]

| | |
|---|---|
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[391] http://www.fiskistofa.is/english/quotas-and-catches/catches-in-individual-species/

### 1.1.4.1.2. Clause 3.2.1.2.

Information shall be available on the potential effect of fishing on endangered, threatened and protected species[392], as appropriate and relevant in the context of the unit of certification.

| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
|---|---|---|---|---|
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**According to the OSPAR Convention, as reported in the 2017 ICES Ecosystem report of the Icelandic Ecoregion, there are vulnerable and /or ETP species occurring in Icelandic waters. Accordingly, there appears to be enough information to assess effects on ETP species in Icelandic waters.**

**Evidence:**

According to the Convention for the Protection of the Marine Environment of the North-East Atlantic or OSPAR Convention, as reported in the 2017 ICES Ecosystem report of the Icelandic Ecoregion[393], there are vulnerable and /or ETP species occurring in Icelandic waters

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| SEABIRDS | |
| *Rissa tridactyla* | Black-legged kittiwake |
| *Uria lomvia* | Thick-billed murre (or Brünnich's guillemot) |
| FISH | |
| *Anguilla anguilla* | European eel |
| *Centrophorus squamosus* | Leafscale gulper shark |
| *Cetorhinus maximus* | Basking shark |
| *Dipturus batis* | Common skate |
| *Hoplosthethus atlanticus* | Orange roughy |
| *Lamna nasus* | Porbeagle |
| *Petromyzon marinus* | Sea lamprey |
| *Salmo salar* | Salmon |
| *Squalus acanthias* | [Northeast Atlantic] spurdog |
| MARINE MAMMALS | |
| *Balaenoptera musculus* | Blue whale |
| *Eubalaena glacialis* | Northern right whale |

OSPAR Contracting Parties are Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom, together with the European Union.

There is enough information to assess the effects on ETP species in Icelandic waters. A comprehensive list of ETP species listed under OSPAR and under the INH Red List, as relevant and interacting with the fishery under assessment (including marine mammals and seabirds), has been assessed in Clause 3.1.1. *Please refer to it for further information.*

| **References:** | See footnote. |
|---|---|

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

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

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

### 1.1.4.2. Clause 3.2.2. By-catch and discards

#### 1.1.4.2.1. Clause 3.2.2.1.

Discarding, including discarding of catches from non-target commercial stocks, is prohibited.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**According to section 2 of Act no. 57/1996, concerning the treatment of commercial marine stocks, discard of catches (although with minor exceptions) is prohibited. Discarding violations are subject to penalty ranging from ISK 400K to 8M.**

**Evidence:**

Since 1996, discarding in Icelandic fisheries is prohibited and subject to penalty[394] (400K to 8M ISK).

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

In a practical sense, if vessels do not have sufficient quota to cover the species they have caught they are required to attain quota through the quota transfer system. Consequently, if vessels do not have sufficient catch quotas for their probable catches they must suspend all fishing activities; this means that under the ITQ system, the discard policy primarily affects the composition of landings and not the aggregate volume[395].

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).

Article 9 Regulation no. 698/2012 on fishing for commercial fishing year 2012/2013 states that:
"The master may decide that part of the catch is not calculated on the vessel's catch quota. This authorization is limited to 0.5% of pelagic catch and 5% of other catches by the relevant vessels during the fishing year and is subject to the following conditions:
a. The catch is kept separately from the other catch of the ship and it is weighed and registered separately.
b. The catch is sold at auction in an approved auction market for seafood, and its proceeds flow to the Fisheries Fund, cf. law no. 37/1992, with subsequent amendments.

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

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

c. The license is divided into four three-month periods during the fishing year. Unused sources may not be transferred between the periods[396].

On sale of VS catches in public fish markets 20% of the revenue generated is paid to the vessel with the remaining 80% going to a designated research and development fund (the VS fund, under the auspices of the Ministry). A maximum of 20% return on VS catches means that there are limited incentives for fishermen to land such catches. However, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, and preventing discard. VS catches of cod in the fishing year 2018/2019[397] are shown below.

| Species | Catch (kg) per season (1st of September 2018 to 31st August 2019) | | | | Total (kg) |
|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | |
| Cod | 193,130 | 204,813 | 665,117 | 184,722 | 1,247,782 |

| | |
|---|---|
| **References:** | Refer to footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

[396] http://www.fiskistofa.is/veidar/aflastada/vs-afli/vsafli.jsp
[397] http://www.fiskistofa.is/veidar/aflastada/vs-afli/vsafli.jsp

#### 1.1.4.2.2. Clause 3.2.2.2.

Where relevant, appropriate steps shall be taken to avoid, minimize or mitigate encounters with seabirds and marine mammals.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Key bycatch risks relate to seabird bycatch in longline gear and gillnets, and marine mammal bycatch in gillnets. There are technical measures/mechanisms in place in Icelandic longliners to mitigate adverse impacts on seabirds. These include the use of acoustic cannons, balloons towed at the end of the vessel to scare-off of diving birds, and night settings to minimise interactions with seabirds. There have been extensive trials with pingers in gillnet gear and research is continuing.**

**Evidence:**

Key bycatch risks relate to seabird bycatch in longline gear and gillnets, and marine mammal bycatch in gillnets. Efforts to minimise seabird interactions with longline gear are summarised below.

**Minimising seabirds interactions and bycatch in longline gear**

The Directorate of Fisheries require longliners to take all reasonable measures to avoid seabirds taking bait or catch because it is an offence in Iceland to catch a seabird with hooks (Reg. 456, 1994).

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

However, during the winter months, some measures are rarely necessary as the lines are shot and hauled in the dark (when it's dark at night and through most of/all of the day) and when few if any diving birds are active.[398] This, however, being an advantage in winter, becomes a challenge in the summer when daylight hours exceed hours of darkness.

Visir HF, a specialised longline fishing company in Iceland (with about 5% of the cod and 6% of the haddock quota in 2018) stated during site visits meetings in Nov. 2018 that it is in the interest of skippers to avoid catching seabirds because when seabirds get hooked, they float and pull up the longlines, decreasing the effectiveness of the gear from catching demersal fish. Furthermore, they reported that every hook in a longline (average 40,000 hooks per longline) has an iron sink to help the longline sink fast to the bottom, further decreasing the risk of diving birds catching on to hooks. Visir HF has reported that similar gear modifications and practices are in use across Iceland (i.e. night setting, bird scaring balloons, acoustic cannons, weighted longlines).

[398] https://abcbirds.org/wp-content/uploads/2015/05/ABC_Analysis_of_MSC_Certification_on_Seabird_Bycatch_Pt_2_Fishery_Analyses.pdf

Information from Birdlife International communications point to available advice for demersal longline, pelagic longline and trawl fisheries - ACAP (the Agreement on the Conservation of Albatrosses and Petrels), which has established best practice mitigation advice for reducing seabird bycatch, reviewed every 18-24 months by experts. It is based on published literature and it is the key resource for assessing the efficacy of bycatch mitigation measures[399] [400].

Based on ACAP advice, the key technical bycatch reduction measures for longlines are: line weighting, bird-scaring lines and night-setting. In comparison, Iceland uses night settings, trailing balloons instead of bird scaring lines (at least to some degree), and some form of weighted lines.

While night settings and acoustic cannons appear to be widely used in Iceland, based on information from the site visits meetings, it is not clear if weighted longlines are set up in the same way consistent with 2017 ACAP Advice, and if/to what degree tori lines are used across the industry. However, variants of scare lines, i.e. trailing balloons and laser lights have been reported to be in use in Icelandic fisheries (Directorate, Visir HF, pers. comm, Nov. 2018).

All of these measures are implemented voluntarily by industry. Currently, there are no regulations in Iceland that direct on the use of explicit bycatch reduction devices/methods within longline fisheries.

**Marine mammals bycatch reduction devices trials**

Acoustic porpoise deterrents (pingers) were tested for the first time in the Icelandic cod gillnet fishery in April of 2017, but their use showed no reduction in porpoise bycatch, as 7 porpoises got caught in nets with pingers, while 5 porpoises got caught in control nets nearby. Another type of porpoise deterrents (PALs) were tested in the cod gillnet fishery in April of 2018 and like the pingers, showed no reduction in porpoise bycatch as 12 porpoises were caught in nets with the devices, while 11 porpoises got caught in the control nets. Almost all the bycaught porpoises in the PAL sets (eleven out of twelve) were large adult males, while the gender ratio was six males and five females in the control sets. Interestingly, eight of the twelve porpoises caught in the PAL sets were found right by the PAL device, suggesting possible attraction of adult males towards the PAL devices[401]. Further trials with pingers were planned for April 2019[402].

Regarding gillnet bycatch of seabirds, current annual takes (2014-2016) based on rough MFRI estimates appear to be very limited (i.e. 0.51% and lower) for species including northern fulmar, common guillemot, northern gannet, Atlantic puffin, razorbill, common eider, cormorants and great black backed gull, with the potential exception of common loon, where takes might be significant at the population level. **This issue has been raised as a non-conformance under clause 3.1.1.** The inability to accurately measure trends in seabird bycatch over time makes it hard to establish whether dedicated steps need to be taken to avoid, minimize or mitigate encounters with seabirds. Accordingly, the issue of underreporting of seabirds and

[399] https://acap.aq/en/bycatch-mitigation/mitigation-advice/3242-acap-2017-review-and-best-practice-advice-for-reducing-the-impact-of-pelagic-longline-fisheries-on-seabirds/file

[400] https://www.iattc.org/Meetings/Meetings2018/SAC-09/BYC-08/PDFs/Docs/_Spanish/BYC-08-INF-J(b)-ENO_ACAP-Review-and-best-practice-advice-for-reducing-the-impact-of-pelagic-longline-fisheries-on-seabirds.pdf

[401] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/HAPISG/2019/ICES%20WGBYC%20Report%202019.pdf

[402] https://nammco.no/wp-content/uploads/2019/04/2018-iceland_progress_report_final2.pdf

| | |
|---|---|
| marine mammals bycatch information in the logbook system is also an active minor non-conformance in this assessment, which is being addressed though a corrective action plan (see NC#1). | |
| **References:** | See footnotes. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.4.2.3. Clause 3.2.2.3.

Non-target catches, including discards, of stocks other than the "stock under consideration" should not threaten these non-target stocks with serious risk of extinction; if serious risks of extinction arise, effective remedial action should be taken.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**Non-target catches, including discards, of stocks associated to the cod fishery, caught with bottom trawl, longline, gillnet, demersal seine and handlines do not threaten these non-target stocks with serious risk of extinction or comparable irreversible risks. Most of these stocks are actively managed by the MFRI.**

**Evidence:**

ICES reports that Icelandic cod catches from 2015/16 to 2017/18 have been caught in these proportions and with the following gears:

| Icelandic cod total catches[403] | | Bottom Trawl | Longline | Gillnet | Demersal seine | Handlines/jiggers |
|---|---|---|---|---|---|---|
| 2017/18 | 270,217 t | 51% [404] | 30% | 7% | 6% | 6% |
| 2016/17 | 237,644 t | 49% [405] | 32% | 7% | 6% | 6% |
| 2015/16 | 251,000 t | 45% [406] | 35% | 8% | 6% | 6% |
| **Average** | | **48.3%** | **32.3%** | **7.3%** | **6%** | **6%** |

Landed bycatch and associated species accounting for > 0.5% of the cumulative total for each of these gear types (i.e. bottom trawl, longline, gillnet, demersal seine and handlines) targeting and/or catching cod are shown in the tables below, compiled from catch data downloaded from the Directorate's website at http://www.fiskistofa.is/veidar/aflaupplysingar/bradabirgdatolur/.

**Table 30.** Cod associated species catch and bycatch above the 0.5% threshold of total catches for each of the five key gear types that targeted and caught cod: bottom trawl, longline, gillnet, demersal seine and handlines, as averaged in the last 3 seasons.

| Gear | Species | 2017/18 catches % | Last 3 years average catches % |
|---|---|---|---|
| Bottom Trawl | Þorskur /cod | 47.24% | 46.96% |
| | Ufsi /saithe | 17.99% | 16.51% |
| | Karfi / Gullkarfi / Golden redfish | 15.67% | 17.28% |
| | Ýsa /haddock | 7.85% | 7.28% |
| | Djúpkarfi / beaked redfish | 3.49% | 3.44% |
| | Grálúða / Greenland halibut | 2.89% | 3.27% |
| | Gulllax / greater silver smelt | 1.64% | 1.69% |

[403] https://www.hafogvatn.is/static/extras/images/02-Cod_TR_isl%20(1)1141502.pdf
[404] http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.5a.pdf
[405] http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cod.27.5a.pdf
[406] http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cod.27.5a.pdf

| | | | |
|---|---|---|---|
| | Skarkoli / plaice | 0.74% | 0.75% |
| | Steinbítur / Atlantic wolffish | 0.55% | 0.61% |
| | Langa / ling | 0.51% | 0.60% |
| **Longline** | Þorskur /cod | 72.72% | 71.60% |
| | Ýsa /haddock | 12.89% | 13.10% |
| | Steinbítur / Atlantic wolffish | 5.01% | 4.67% |
| | Langa / ling | 3.93% | 4.41% |
| | Keila / tusk | 1.90% | 2% |
| | Karfi / Gullkarfi / Golden redfish | 1.08% | 1.17% |
| | Hlýri / spotted wolffish | 0.78% | 0.86% |
| | Ufsi /saithe | 0.58% | 0.66% |
| | Tindaskata / starry ray | 0.40% | 0.74% |
| **Gillnet** | Þorskur /cod | 89.02% | 81.65% |
| | Ufsi /saithe | 5.58% | 7.41% |
| | Grálúða / Greenland halibut | 0% | *5.51% |
| | Langa / ling | 1.66% | 2.33% |
| | Ýsa /haddock | 1.43% | 1.28% |
| | Skarkoli / plaice | 0.84% | 0.75% |
| | Karfi / Gullkarfi / Golden redfish | 0.38% | 0.46% |
| **Demersal Seine** | Þorskur /cod | 48.39% | 50.54% |
| | Skarkoli / plaice | 17.25% | 16.41% |
| | Ýsa /haddock | 15.15% | 15% |
| | Steinbítur / Atlantic wolffish | 6.60% | 5.09% |
| | Þykkvalúra / Sólkoli / lemon sole | 3.69% | 3.58% |
| | Ufsi /saithe | 3.22% | 3.14% |
| | Karfi / Gullkarfi / Golden redfish | 1.80% | 1.54% |
| | Langlúra / witch | 1.46% | 2.06% |
| | Sandkoli/dab | 1.21% | 1.14% |
| | Langa / ling | 0.53% | 0.66% |
| **Handline/ Jiggers** | Þorskur /cod | 74.10% | 67.51% |
| | Makríll / mackerel | 19.98% | 26.07% |
| | Ufsi /saithe | 4.91% | 5.43% |
| | Karfi / Gullkarfi / Golden redfish | 0.57% | 0.60% |

Target and non-target catches, including discards, of stocks other than cod, as listed in the table above, do not threaten any of these stocks with serious risk of extinction. **However, please refer to the issues of spotted wolffish bycatch overharvesting highlighted and scored under clause 3.1.1 where an assessment of all bycatch has been reported.**

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.4.2.4. Clause 3.2.2.4.

Suitable steps shall be considered to avoid, minimize or mitigate encounters with endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**As appropriate, suitable steps are considered to avoid, minimize or mitigate encounters with endangered, threatened and protected species, as appropriate and relevant in the context of the cod fishery. Most of these steps include ban on direct harvest for these species.**

**Evidence:**

According to the Convention for the Protection of the Marine Environment of the North-East Atlantic or OSPAR Convention, as reported in the 2018 ICES Ecosystem report of the Icelandic Ecoregion[407].

| SCIENTIFIC NAME | COMMON NAME |
|---|---|
| SEABIRDS | |
| *Rissa tridactyla* | Black-legged kittiwake |
| *Uria lomvia* | Thick-billed murre (or Brünnich's guillemot) |
| FISH | |
| *Anguilla anguilla* | European eel |
| *Centrophorus squamosus* | Leafscale gulper shark |
| *Cetorhinus maximus* | Basking shark |
| *Dipturus batis* | Common skate |
| *Hoplosthethus atlanticus* | Orange roughy |
| *Lamna nasus* | Porbeagle |
| *Petromyzon marinus* | Sea lamprey |
| *Salmo salar* | Salmon |
| *Squalus acanthias* | [Northeast Atlantic] spurdog |
| MARINE MAMMALS | |
| *Balaenoptera musculus* | Blue whale |
| *Eubalaena glacialis* | Northern right whale |

OSPAR Contracting Parties are Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom, and the European Union.

Suitable steps are considered to avoid, minimize or mitigate encounters with endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification. Most of these steps include the ban on direct harvest. For other marine mammal and seabird species, the take is not considered to be significant and as such, specific steps to mitigate encounters with endangered, threatened and protected

407 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/IcelandicWatersEcoregion_EcosystemOverview.pdf

species may not strictly be necessary. Detailed information has been provided under clause 3.1.1, including information on seabirds and marine mammals listed in the Icelandic INH Red list[408]. **Please refer to that for further details, including non-conformance details.**

A summary is provided below for species that interact with the fishery under assessment, or related ones.
The table below provides catch information for species mentioned in the OSPAR table which have relevance to the Icelandic fisheries. Further below there is additional information about some of these species.

**Table 31.** Icelandic landings in tonnes of common skate (*Dipturus batis*), Atlantic halibut (*Hippoglossus hippoglossus*), orange roughy (*Hoplosthethus atlanticus*) spiny dogfish (*Squalus acanthias* also known as spurdog), Greenland shark (*Somniosus microcephalus*) and Porbeagle shark (*Lamna nasus*) 2006 – 2017. Data downloaded from the Fiskistofa[409] website, on August 8th 2019.

| Species catches (t) per year | 2006/ 07 | 2007/ 08 | 2008/ 09 | 2009/ 10 | 2010/ 11 | 2011/ 12 | 2012/ 13 | 2013/ 14 | 2014/ 15 | 2015/ 16 | 2016/ 17 | 2017/ 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common skate | 136 | 123 | 127 | 128 | 117 | 125 | 145 | 153 | 141 | 157 | 132 | 139 |
| Atlantic halibut | 559 | 516 | 529 | 548 | 557 | 555 | 36 | 39 | 45 | 87 | 123 | 137 |
| Orange roughy | 0.9 | 3.7 | 0.1 | 1 | 1.5 | 19 | 56 | 13 | 6 | 5.8 | 36.6 | 18.9 |
| Spiny dogfish | 82 | 43 | 68 | 102 | 62 | 53 | 51 | 6 | 19 | 8 | 8 | 2 |
| Greenland shark | 28 | 2 | 35 | 26 | 43 | 18 | 19 | 6 | 26 | 18 | 26 | 10 |
| Porbeagle shark | 0.4 | 0.4 | 1.1 | 1 | 1.1 | 1 | 0.8 | 0.9 | 0.4 | 0.8 | 1.1 | 1.2 |

**Common skate (Grey skate)**

There is no TAC or directed fishery for this species. A taxonomic revision of these species has concluded that the smaller-bodied blue skate should retain the scientific name *Dipturus batis* and the larger-bodied flapper skate is now referred to as *Dipturus intermedius* (Last et al., 2016). Total catch of skate in Icelandic waters in 2017/18 was 139 tonnes, very close to the 10 years average. Recent survey trends in Icelandic waters indicate some increase in the scientific groundfish survey. Accordingly, the current management framework does not appear to be causing further declines in this species. There are currently no robust indicators of stock size for blue skate and flapper skate in EU waters[410], however, the Spanish Porcupine Bank survey (SpPGFS-WIBTS-Q4) has seen increasing catch rates of Dipturus spp. (ICES, 2018). It is noted that this survey may not be representative of the whole stock area. Also, the UK southwestern beam trawl survey (UK-Q1-SWBeam) caught immature blue skate, with preliminary studies indicating an increasing trend in Division 7.e (ICES, 2018). These and other surveys in the Celtic Seas may provide a stock size indicator in the future.

[408] https://en.ni.is/node/27837
[409] http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/
[410] http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/rjb.27.67a-ce-k.pdf

**Atlantic halibut (*Hippoglossus hippoglossus*)**
Atlantic halibut is classified as Endangered on the IUCN Red list but has been last assessed globally in 1996[411]. Annual landings of Atlantic halibut were 36–119 tonnes in 2012–2018, which are the lowest landings since the beginning of the fishery. The decrease is due to management decisions. The survey indices have been relatively stable between years, and uncertainties around them are low. A committee established in 2010 by the minister of fisheries due to the poor state of the Atlantic halibut stock, concluded that the most effective way to rebuild the stock would be to ban all targeted fishing. In 2012, a regulation was issued to ban all targeted fishing for Atlantic halibut[412] and stipulating that all viable halibut in other fisheries must be released. In 2019, MFRI's advice is that these regulations remain in effect[413].

**Orange roughy (*Hoplostethus atlanticus*)**
Recent catches of orange roughy in Iceland have been quite small recently and have been 18.9 tonnes in 2017-18. Orange roughy is considered Vulnerable under the IUCN red list as assessed last in 2014[414]. During the November 2018 on-site visits, the MFRI stated that there is limited overlap between bottom trawl fisheries and the orange roughy stock because it occurs in deeper water than other species.

**Ban on fishing for spiny dogfish, Porbeagle sharks and Basking shark**
Regulation 456/2017 states that there is a ban on fishing for Porbeagle sharks, Basking shark and spiny dogfish. Any incidental catches of these species are to be landed and sold on an approved auction market for marine products according to the provisions of Act no. 37/1992, on a special fee for illegal fishing, with subsequent amendments. [415] This is the same mechanism adopted (i.e. VS catches) for Atlantic halibut catches, for which directed fishing is banned.

**Leafscale gulper sharks**
Leafscale gulper sharks are usually only found in waters deeper than fisheries for cod, haddock, saithe and redfish operate in.

**Spiny dogfish / spurdog**
There is no directed fishery for spiny dogfish and current catches are solely bycatch in other fisheries, primarily gillnet fisheries off the southern coast during the summer months.

**Blue Whale**
No issues have been identified with the fishery under assessment. This was confirmed during the November 2018 site visits by the MFRI.

**Northern Right Whale**
No interactions between Blue whales and Northern right whales have been recorded in recent years with Icelandic fisheries. This was confirmed during the November 2018 site visits by the MFRI.

411 https://www.iucnredlist.org/species/10097/3162182
412 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302

413 https://www.hafogvatn.is/static/extras/images/21-AtlanticHalibut1141466.pdf
414 https://www.iucnredlist.org/species/155168/45884209
415 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017

**Harbour seals**

Harbour seals are classified as Least Concern in the IUCN Red List[416] (population trend is unknown, last assessed in 2016). However, harbour seals are currently classified as Critically Endangered on the Icelandic National Red list, based on IUCN criteria[417] and 2016 population estimates[418]. Between 2014 and 2018, it has been estimated that annually, 15 harbour seals were bycaught in cod gillnet fisheries (CV=1.02) and 17 harbour seals in bottom trawls (CV=1.00) (Marine and Freshwater Institute, in prep.)[419].

Based on these most recent estimates, 97.7% of the harbour seal bycatch can be attributed to the lumpfish fishery and the reminder 1.07% to the cod gillnet fishery and 1.22% to the bottom trawl fishery. In the bottom trawl fishery, cod made up less than 50% of total catches in the past 3 seasons, hence this fishery is responsible for about 0.6% of the harbour seal bottom trawl bycatch.

Current harbour seal bycatch is for the most part dependent upon lumpsucker fishery effort[420]. A full population survey was conducted during the moulting period in 2018 and the data analysis is currently ongoing. Icelandic authorities are investigating possibilities of how legislation on seal hunting and obligatory reporting of catch statistics can be implemented. There is an increased effort to improve by-catch data collection. MFRI will define a population level objective based on biological criteria[421].

**Grey seals**

The Icelandic grey seal (*Halichoerus grypus*) population has decreased from an estimated 9000 animals in 1982 to 4200 animals in 2012. They are classified as Least Concern (population increasing, last assessed in 2016) on the IUCN Red List[422] but as Vulnerable in the Icelandic National Red List[423] based on a 2018 assessment. The population is currently estimated in the 2019 MFRI Advice to be 6300 animals, which is above the management objective of 4100 animals. If the population decreases significantly measures will be taken to reverse the trend.

**Ringed and hooded seals**

The interaction between cod gillnet fisheries and hooded seals appear to be quite limited. 47 hooded seals (*Cystophora cristata*) where caught in 2015 (none in 2014 and 2016). Hooded seals are considered Vulnerable in the IUCN Red List[424] (last assessed in 2015). Hooded seals are native and resident to Canada, Greenland and Iceland, their current estimated population is 340,000 mature individuals and their population trend is unknown. The ICES/NAFO/NAMMCO working group on harp and hooded seals (WGHARP) will meet in Tromsø, Norway, 2-6 September 2019. New data from all populations is available and the group will do assessments of status and harvest potentials[425].

**Black-legged Kittiwakes (*Rissa tridactyla*)**

None have been report as bycatch in the 2014-2016 data set provided by the MFRI.

[416] https://www.iucnredlist.org/species/17013/45229114
[417] https://www.ni.is/midlun/utgafa/valistar/spendyr/valisti-spendyra
[418] https://www.ni.is/node/27368
[419] https://www.hafogvatn.is/static/extras/images/landselur_191145061.pdf
[420] https://www.hafogvatn.is/static/research/files/hv2017-009pdf
[421] https://nammco.no/wp-content/uploads/2017/01/sc-report-2018_270519_cor250619_rec-walrus.pdf
[422] https://www.iucnredlist.org/species/9660/45226042
[423] https://www.ni.is/node/27369
[424] https://www.iucnredlist.org/species/6204/45225150
[425] https://nammco.no/wp-content/uploads/2017/01/sc-report-2018_270519_cor250619_rec-walrus.pdf

**Thick-billed murre (*Uria lomvia*)**

None have been reported as bycatch in the 2014-2016 data set provided by the MFRI.

Additional seabirds caught in 2014-2016 in cod fisheries and assessed as ETP species by the Iceland Institute of Natural History (INH) Red List Classification are shown below.

| Species | Cod gillnets | Longline | Otter trawl | Iceland Institute of Natural History (INH) Red List Classification | Population estimated in INH's 2018 Red List | Annual bycatch % removal of estimated population* |
|---|---|---|---|---|---|---|
| Northern fulmar (*Fulmarus glacialis*) | 1702 (1362-2042) | 920 (340-1500) | 0 | Endangered | 1.2 million pairs | 0.11% |
| Common guillemot (*Uria aalge*) | 454 (340-568) | 0 | 0 | Vulnerable | 693,000 pairs | 0.03% |
| Northern gannet (*Morus bassanus*) | 128 (69-187) | 0 | 45 (2-90) | Vulnerable | 37,000 pairs | 0.23% |
| Atlantic puffin (*Fratercula arctica)* | 13 (1-26) | 0 | 0 | Critically Endangered | 2 million pairs | 0.00% |
| Razorbill (*Alca torda*) | 26 (2-52) | 0 | 0 | Near threatened | 313,000 pairs | 0.00% |
| Common loon (*Gavia immer*) | 82 (3-164) | 0 | 0 | Vulnerable | 200–300 pairs | 16.40% |
| Common eider (*Somateria mollissima*) | 142 (2-282) | 0 | 0 | Vulnerable | 850,000 birds | 0.02% |
| Cormorants (*Phalacrocorax carbo*) | 0 | 47 (16-78) | 0 | Least Concern | 4,581 pairs | 0.51% |
| Great-black backed gull (*Larus marinus*) | 0 | 67 (2-134) | 0 | Endangered | 6,000–8,000 pairs | 0.48% |

Catches of these species are not generally considered significant. The *Gavia immer* takes have been assessed and scored under clause 3.1.1. Please refer to this for further information.

| **References:** | See footnotes. |
|---|---|
| **Non-Conformance Number (if relevant)** | **NA** |

#### 1.1.4.2.5. Clause 3.2.2.5.

Appropriate steps shall be taken to avoid the loss of fishing gear and ghost fishing of lost and abandoned gear.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**There are a number of initiatives and regulations in place to avoid the loss of fishing gear and subsequent ghost fishing of lost and abandoned gear. Where Fiskistofa finds and recovers lost or abandoned gear they recover the cost of recovery from the gears' owner. The Directorate confirmed that gear loss (e.g. longlines, gillnets which can go lost) and ghost fishing is not considered an issue and that reporting lost gear is compulsory. Additionally, the Icelandic ITQ system operates in such a way that gear losses are minimised.**

**Evidence:**

The Icelandic ITQ system allows for a slower paced fishery than would be expected if there was only an overall TAC with all boats fishing against it. Accordingly, the system allows fishers to target their efforts in optimum weather conditions leading to decreased rates of lost fishing gear. During the November 2018 site visits, the Directorate confirmed that gear loss (e.g. longlines, gillnets) and as such ghost fishing is not considered an issue and that reporting lost gear is compulsory.

There are a number of initiatives and regulations in place to avoid the loss of fishing gear and subsequent ghost fishing of lost and abandoned gear. Recycling schemes are in place to encourage fishers to bring old gear ashore and it is illegal to dump old gear at sea. Where Fiskistofa finds and recovers lost or abandoned gear they recover the cost of recovery from the gears' owner markings. For example, in the 2015 lumpfish season the Directorate contracted two vessels to go out and specifically look for and recover lost gear. The Coastguard also reports any buoys it feels might represent lost or abandoned fishing gear to the Directorate. All regulations relating to fishing gear may be found in the various Articles of Fisheries Management 2018 Laws and regulations[426].

In the case of gillnets fishers are required to attend their nets at regular intervals and retrieve them before going ashore. According to Article 4 of Act 57/1996, concerning the Treatment of Commercial Marine Stocks (Translated from Icelandic); *"Nets and other gear (such as longlines), which are left in the sea, must be drawn on an appropriate and regular basis as circumstances allow. The Fisheries Directorate may remove, or have removed gears that are not been looked after properly. The same applies to fishing gear remaining in the sea after the end of fishing season, gears that are illegal or gears deployed in areas where their use is prohibited. The Directorate shall demand that the owners of fishing gear, removed from the sea by authority in paragraph 2 pay the costs associated with their removal. If the owner of the fishing gear is not known, the Directorate may sell the gear with profits going to the MFRI."* This means that gear is not left out in inclement weather conditions that might lead to increased gear loses.

[426] http://vefbirting.oddi.is/raduneyti/fiskveidar2018/108/

| | |
|---|---|
| Another important factor that contributes to low levels of lost fishing gear is the high price of that gear. This means that fishers are careful to avoid losing their gear.<br><br>In the case of trawls the majority of vessels carry special grapples onboard that allow them to retrieve lost gear even when both towing warps have parted, a quite rare situation. | |
| **References:** | See footnote. |
| **Non-Conformance Number (if relevant)** | **NA** |

### 1.1.4.3. Clause 3.2.3 – Habitat Considerations

#### 1.1.4.3.1. Clause 3.2.3.1.

If studies show that the spawning or nursery areas or other essential habitats in the fishing area are at risk and highly vulnerable to negative impacts of particular fishing gear, such impacts shall be limited in range relative to the full spatial range of the habitat or else action is taken to avoid, minimise or mitigate such impacts.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**Fishing with trawls is prohibited in large areas near the coast which serve as spawning and nursery areas. Large areas within the Icelandic EEZ are closed for fishing, either temporarily or permanently. These closures are aimed at protecting juveniles and spawning fish and protecting vulnerable marine ecosystems.**

**Evidence:**

**Nursery areas**

Fishing with trawls is prohibited in large areas near the coast which serve as spawning and nursery areas.

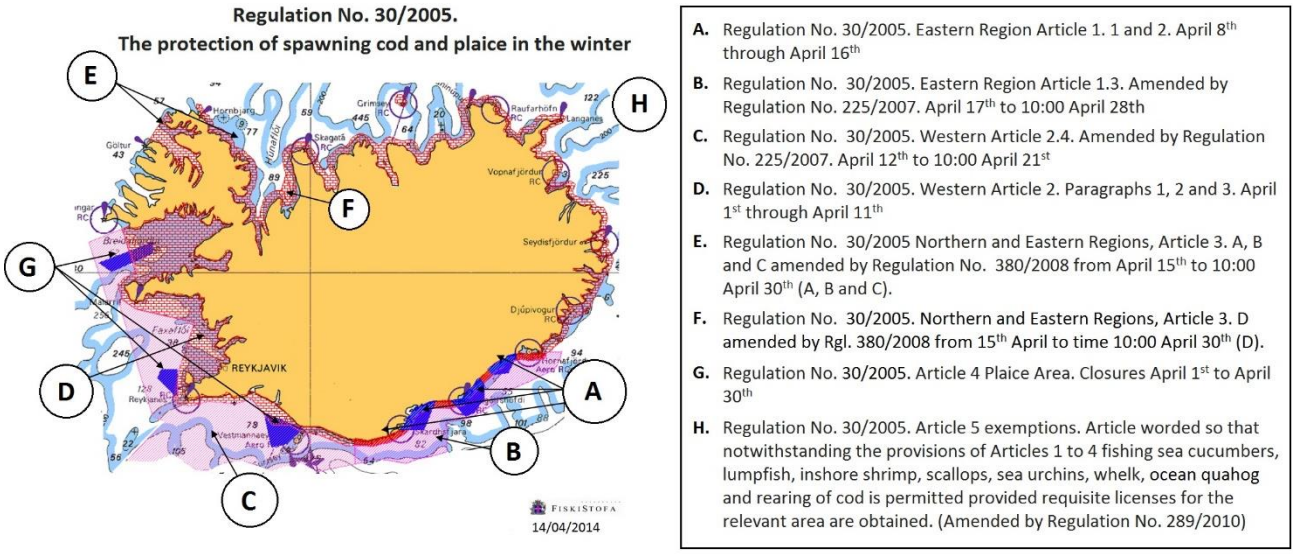



**Figure 68.** Permanent closures to protect spawning grounds for cod and plaice[427].

**Closures**

Large areas within the Icelandic EEZ are closed for fishing, either temporarily or permanently. There are many large closures for bottom trawl gear around Iceland (please refer to Clause 3.1.1). Collectively, these closures are aimed at protecting juveniles and spawning fish and protecting vulnerable marine ecosystems from gear

427 http://www.fiskistofa.is/media/veidisvaedi/Hrygningarstopp_2.pdf

interactions. The large, long and narrow trawl closures in the South West of Iceland were originally designed to protect golden redfish juveniles, and were originally set up in the early 1990s[428]

Furthermore, the use of bottom trawl and pelagic trawl is not permitted inside a 12-mile limit measured from low-water line along the northern coast of Iceland. Similar restrictions are implemented elsewhere based on engine size and size of vessels[429].

Off Northwest and North coast of Iceland, fishing by bottom trawl, midwater trawl and Danish seine is not allowed within 12 miles from a line drawn across the mouth of fjords and bays.

Off the East, South and West coast, bottom trawling is permitted according to vessel size and engine power, with larger vessels (over 42 m) not having access within 12 miles, but the smaller vessels (less than 29 m) in some areas up to 4 miles. These openings are both area - and time based[430]. The ships are divided into 3 groups depending on their length and power. Group 1 are the largest ships. The green area represents the temporal allowance for fishing.

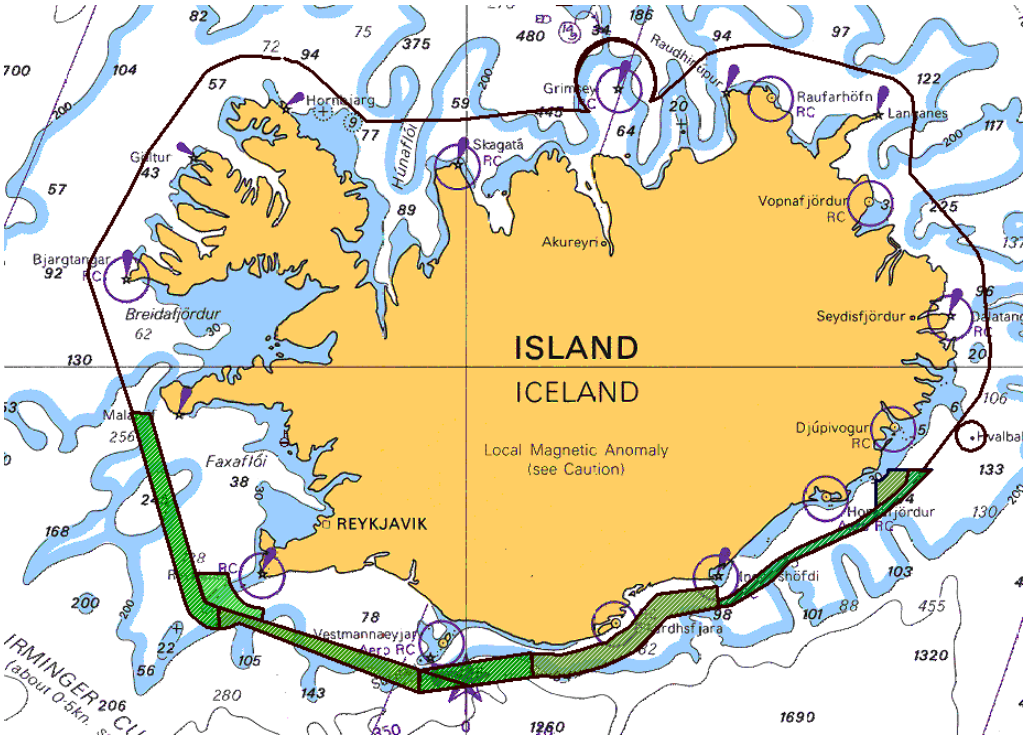



**Figure 69.** Temporary fishing areas for group 1, large-size vessels.

[428] https://www.hafogvatn.is/static/research/files/fjolrit-133pdf
[429] https://www.government.is/news/article/?newsid=e747dac7-fb88-11e7-9423-005056bc4d74
[430] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/domsmalaraduneyti/nr/1154

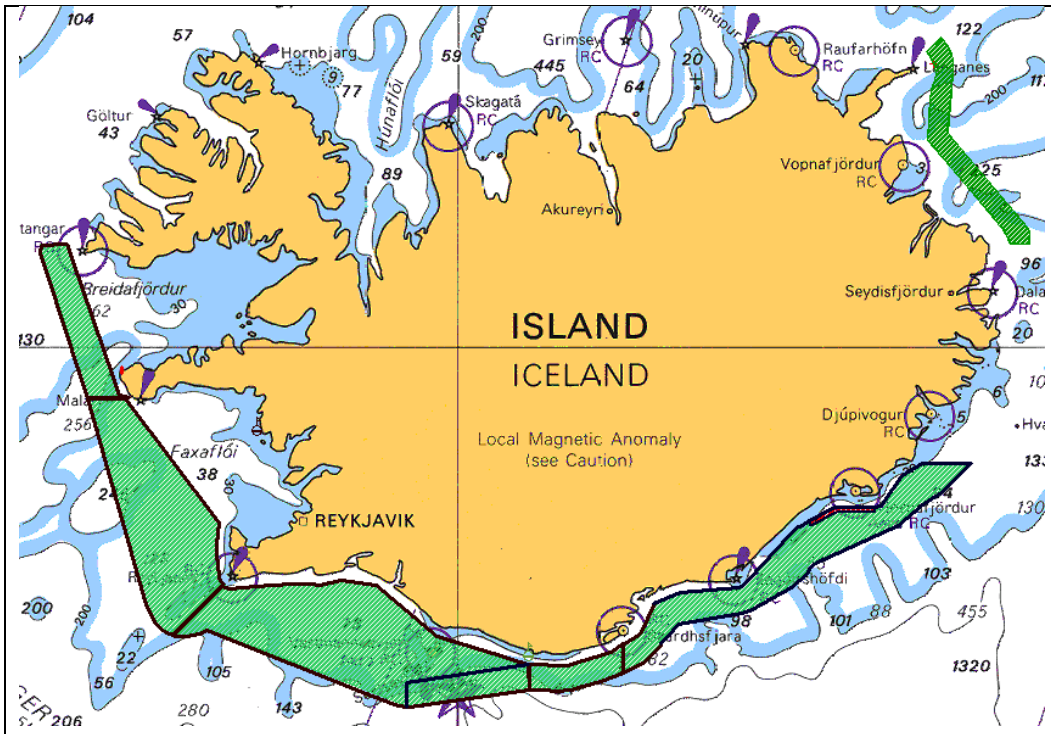



**Figure 70.** Temporary fishing areas for group 2, mid-size vessels.


**Figure 71.** Temporary fishing areas for group 3, small-size vessels.

These closures, in particular those of a permanent nature listed under clause 3.1.1, provide wider ecological benefits over and above their intended fisheries management objective by offering *de facto* protection from fishing activity to other elements of the marine environment.

In addition to closures that are permanent or regular (See Clause 1.3.2.3.2 for details), there is a system for protecting juveniles by closing areas temporarily on short notice. These are triggered when finding too much juveniles in catches. They are managed by the MFRI, often at the advice from the Coast Guard or the fishing fleet, applied on few hours' notice and normally valid for 2 weeks. They are published in several channels, including on the web[431]. If an area is closed via temporary closures more than 3 times, MFRI may decide to make it a permanent closure. The juvenile thresholds for closing areas are: cod 25% under 55 cm, haddock 30% under 45 cm, saithe 30% under 55 cm, redfish 20% under 33 cm.

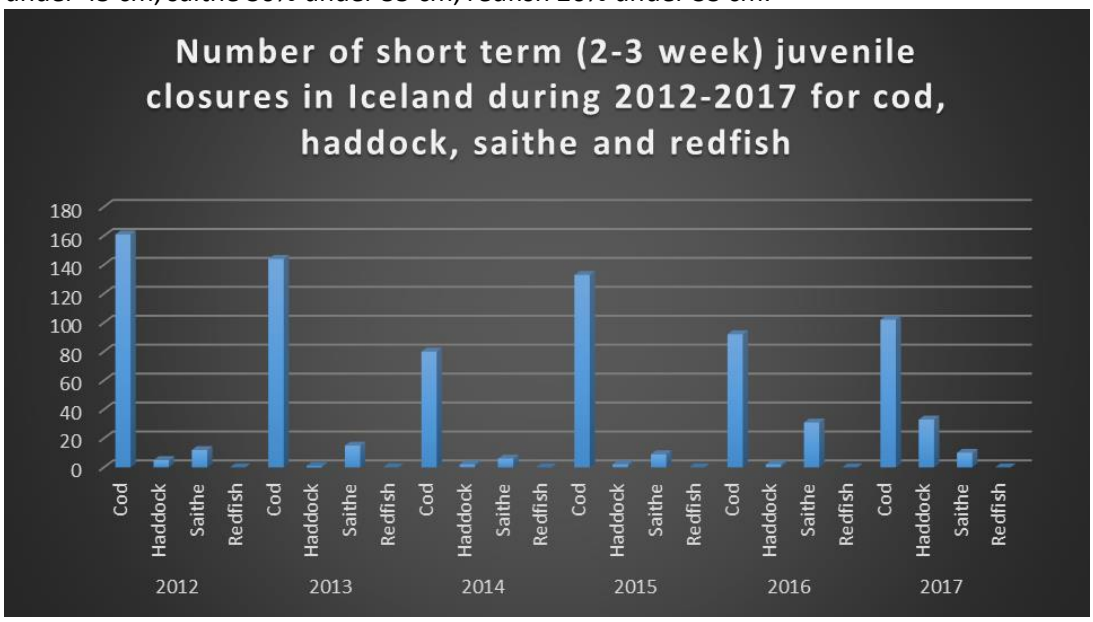



**Figure 72.** Short term/sudden closures (e.g. 2-3-week closures) implemented in Icelandic waters to protect juveniles of cod, haddock, saithe and redfish from 2012 to 2017. Source MFRI, provided during the 2018 site visits.

Commonly encountered habitats in the Icelandic ecoregion tend to be hard ground, varying from sandy mud to gravel and cobbled areas (Ragnarsson & Steingrímsson, 2003[432]). These areas tend to be resilient, more dynamic areas and it is unlikely that bottom trawl gear will reduce their structure and function to the point where there would be serious irreversible harm, as they have been fished for many years and still provide productive fish stocks over the long-term.

Please also refer to additional fishery closures listed in Clause 3.1.1.

| **References:** | See footnote. |
|---|---|
| **Non-Conformance Number (if relevant)** | **NA** |

431 https://www.hafogvatn.is/is/skyndilokanir

[432] https://academic.oup.com/icesjms/article/60/6/1200/652072

### 1.1.4.3.2. Clause 3.2.3.2.

Management measures must take into account significant continuous stony coral areas, identified through scientific and formal methods.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**
**The Icelandic government has closed 10 areas in South East Iceland where significant coral cover has been identified through scientific research.**

**Evidence:**
**Cold water coral communities**
The coral water coral closures protect *Lophelia pertusa,* a species of cold-water coral which is extremely slow growing, associated with diverse communities and may be harmed by destructive fishing practices. In 2004 a research project mapped coral areas off Iceland and as a result 10 areas in to the southeast of Iceland were permanently closed to fishing.

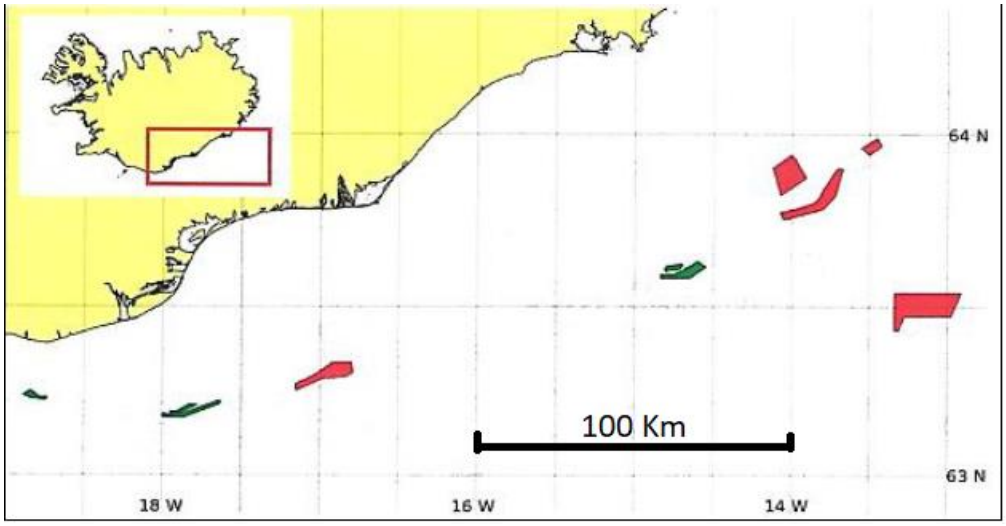



**Figure 73.** Ten coral closures in South East Iceland, current as of November 2018. Maps can be viewed by downloading Google Earth and clicking on the following kml file produced by the Directorate of Fisheries http://uv.fiskistofa.is/uv.kml

| | |
|---|---|
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

#### 1.1.4.3.3. Clause 3.2.3.3.

Such areas shall be documented and protected through their closure to fishing, where appropriate, with gear that has significant bottom impact (established through 3.2.4.2).

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**The Icelandic government has closed 10 areas in South East Iceland where significant coral cover has been identified through scientific research.** | | | | |
| **Evidence:**<br>Please see the evidence provided under clause 3.2.3.2. | | | | |
| **References:** | As noted. | | | |
| **Non-Conformance Number (if relevant)** | | | | **NA** |

### 1.1.4.3.4. Clause 3.2.3.4.

Known thermal vents structures shall be protected through area closure to fishing activities with gear that has significant bottom impact during normal operation.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**There are two known hydrothermal vent areas with series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island and are fully protected by environmental law no. 249/2001 and 510/2007.**

**Evidence:**

There are two known hydrothermal vent areas with series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island (see map below) and are fully protected by environmental law nr 249/2001 and 510/2007[433]. In addition, there are known hydrothermal vents deep north of Iceland on the Grimsey-Kolbeinsey ridge and at Steinakoll, south of Melsa at the Reyjkjanes ridge, Southwest Iceland. These are in more remote areas and have less surface structure and are not been considered threatened by fishing activities (evidence received by the MRI, September 2014, as part of the original full assessment activities, see also Interridge vents map here[434]).


**Figure 74.** Coordinates and location of protected natural resources (i.e. hydrothermal vent) at Arnarnesstrýtur in Eyjafjörður north of the Arnarnes river[435].

[433] https://www.ust.is/library/Skrar/Einstaklingar/Fridlyst-svaedi/Auglysingar/hverastrytur_eyjafirdi_249_2001.pdf
[434] https://vents-data.interridge.org/ventfields-osm-map
[435] https://www.ust.is/library/Skrar/Einstaklingar/Fridlyst-svaedi/Auglysingar/Hverastrytur_Arnarnesnofum_kort.pdf

| | |
|---|---|
| Chen (2003)[436] provides an example of a lesser surface structure hydrothermal vent is the Reykjanes Ridge. Detailed along- axis survey [German et al., 1994 and German and Parson, 1998] has found only one hydrothermal vent along the 600 km of the Reykjanes Ridge, which corresponds to a value of 0.014 for the "plume incidence" factor. The plume incidence is defined as the fraction of the ridge segment length overlain by hydrothermal plumes or vent fields. Therefore, it represents an average assessment of the hydrothermal activity on a segment scale. German and Parson [1998] also reported that conventional black smoker plumes are almost completely absent, even directly above the recently imaged axial magma chamber at 57°45'N [Sinha et al., 1997]. For comparison, data collected at the 11°N–30°N area of the Mid-Atlantic Ridge (MAR), which was thought as a good representative of hydrothermal activities at the MAR, have yielded an along-axis average of at least one vent site for every 150 km [German et al., 1995]. This translates into a plume incidence factor of 0.053 for MAR. These observations suggested that the Reykjanes Ridge is associated with at least a factor of 4 less than normal hydrothermal activity at MAR. | |
| **References:** | As referenced. |
| **Non-Conformance Number (if relevant)** | **NA** |

[436] http://onlinelibrary.wiley.com/doi/10.1029/2001JB000816/full

### 1.1.4.4. Clause 3.2.4. Foodweb Considerations

#### 1.1.4.4.1. Clause 3.2.4.1.

If the stock under consideration is a key prey species in the ecosystem, the harvesting policy and management measures shall be directed to avoid severe adverse impacts on dependent predators.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |

**Summary Evidence:**

**In the waters to the north and east of Iceland, available information suggests the existence of a simple bottom-up controlled food chain from phytoplankton through *Calanus spp.*, capelin and to cod. Less is known about the structure of the more complex southern part of the ecosystem. Icelandic cod appears to be reasonably well connected to other key fish species as both prey and predator but it does not appear to be a key prey species in the Icelandic marine ecosystem, so it is not necessary that harvesting policy and management measures are specifically directed to avoid severe adverse impacts on dependent predators.**

**Evidence:**

The MRI has studied Icelandic cod and its place/relationship in the ecosystem. Extensive studies on the feeding ecology of a large number of demersal fish species including cod, marine mammals and seabirds have shown that capelin is a key prey species in the Icelandic ecoregion ecosystems.

In the waters to the north and east of Iceland, available information suggests the existence of a simple bottom-up controlled food chain from phytoplankton through *Calanus spp.*, capelin and to cod. Less is known about the structure of the more complex southern part of the ecosystem.

According to the 2018 acoustic autumn survey, the capelin SSB is estimated 238 000 tonnes[437]. The harvest control rule (HCR) aims at leaving with 95% probability at least 150 000 tonnes (Blim) of mature capelin at the time of spawning in March. Model projections show that even with no catch during the fishing season 2018/2019 the HCR expectations will be achieved. The juvenile index was very low and has been in recent years.

Cod is an opportunistic predator that forages mainly at dawn and dusk[438]. Larvae feed mainly on zooplankton while juveniles' prey predominantly on benthic crustaceans; adults feed mainly on zoobenthos and fish including juvenile cod. Fish prey becomes more common in the diet with increasing body size. Adults may cover large distances during the feeding period. Young cod are also preyed upon by different fish species and octopus. Adult cod are prey items of top predators like sharks, rays, whales, dolphins, seals, and sea birds.

Cod's trophic level tends to be above 4 in both fished and unfished populations[439].

[437] https://www.hafogvatn.is/static/extras/images/LodnaHaust20181100274.pdf
[438] https://www.fishbase.se/Ecology/FishEcologySummary.php?StockCode=79&GenusName=Gadus&SpeciesName=morhua
[439] https://www.fishbase.se/references/FBRefSummary.php?id=26813

A June 2018 publication by Sturludottir *et. al.*[440] described the results of an ecological end-to-end model built using the Atlantic framework for the Icelandic marine ecosystem. Atlantis is a spatially resolved deterministic end-to-end model designed for exploited marine ecosystems.

The modeling framework consists of four sub-models: biophysical, fisheries, management and socio-economic. It has been used to explore major processes and responses in systems and it has been used for management strategy evaluations.

Study results indicated that predators in Icelandic waters were feeding on the correct groups, but they were relying too much on zooplankton and benthic invertebrates in the model than what the stomach data indicated (Figure below). The zooplankton could however be under-represented in the stomach content data because of differences in digestion rates (Hyslop, 1980). Sandeel were not as large a component of the diet of its predators as they should have been.

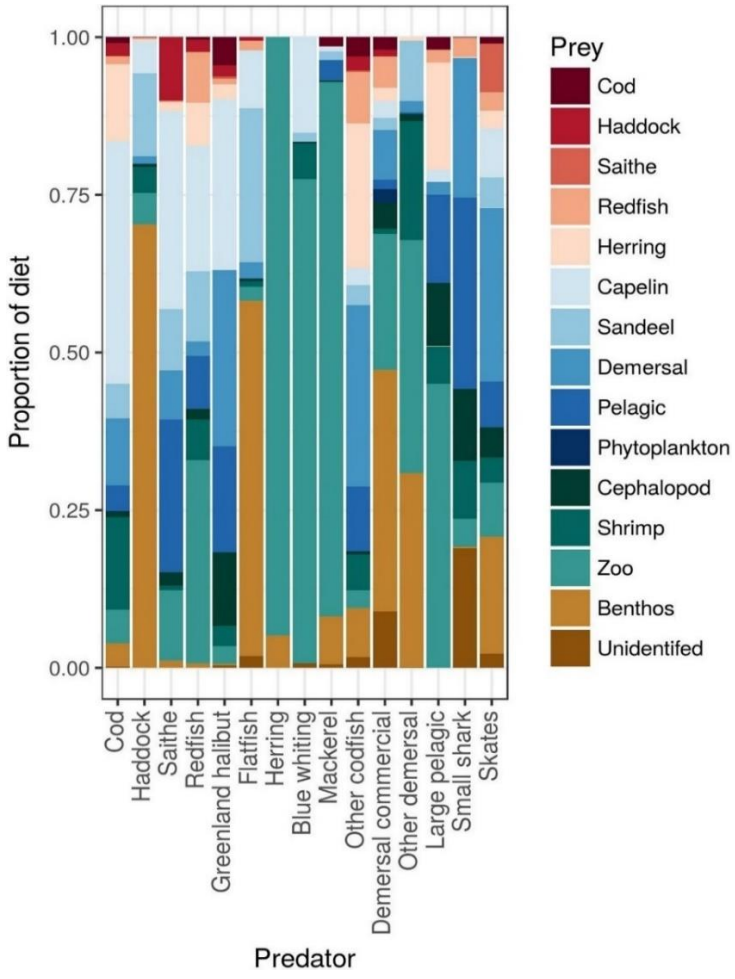



**Figure 75.** Average diet composition from stomach content data that was available for 15 of the 20 fish groups.

[440] https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/HAPISG/2018/01%20WGSAM%20-%20Report%20of%20the%20Working%20Group%20on%20Multispecies%20Assessment%20Methods.pdf

Data from the MFRI on stomach content and information from the literature (Gunnarsson et al., 1998; Jónsson and Pálsson, 2013) was used as a guideline when tuning the availability of each prey. The resulting modeled food web in the study was quite complex and presented below.

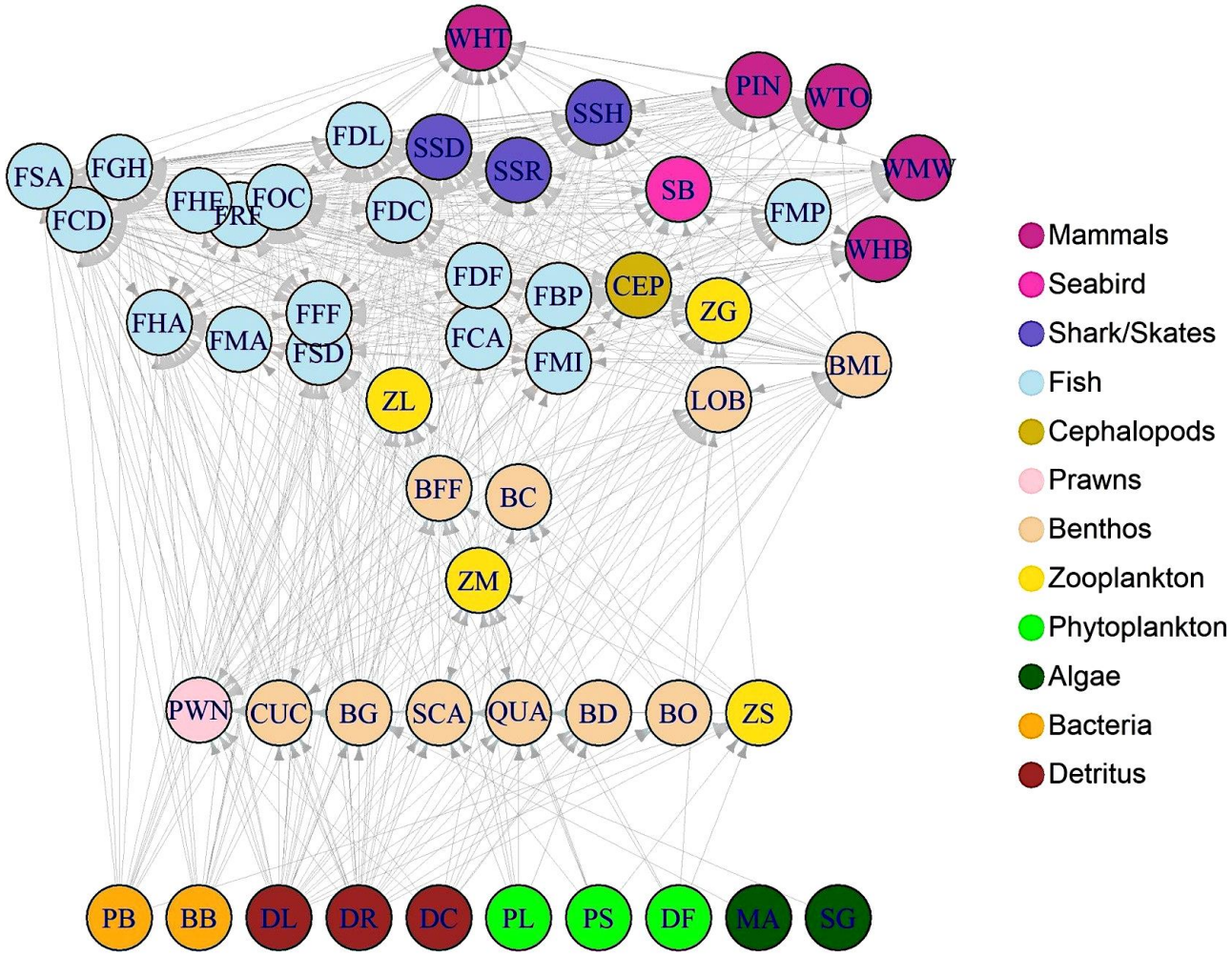



**Figure 76.** Food web connections between the modeled functional groups. Important fish species codes: FCD is Cod (*Gadus morhua*); FHA is Haddock (*Melanogrammus aeglefinus*); FSA is Saithe (*Pollachius virens*), FRF is Redfish (Sebastes sp); FGH is Greenland halibut (*Reinhardtius hippoglossoides*), FFF is Flatfish, FHE is Herring (Clupea harengus); FCA is Capelin (*Mallotus villosus*), FMI is Blue whiting (*Micromesistius poutassou*), FMA is Mackerel (*Scomber scombrus*).

Icelandic cod appears to be reasonably well connected to other key fish species as both prey and predator but it does not appear to be a key prey species in the Icelandic marine ecosystem so it is not necessary that harvesting policy and management measures are specifically directed to avoid severe adverse impacts on dependent predators.

| **References:** | See footnotes. |
|---|---|

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

### 1.1.4.5. Clause 3.2.5. Precautionary Considerations

#### 1.1.4.5.1. Clause 3.2.5.1.

Management plans shall be developed and implemented in a timely fashion for avoiding, minimizing or mitigating any ecosystem issues properly identified. These shall be based on risk analysis and scientific advice, consistent with the precautionary approach[441], as being of serious concern in the fishery in question.

| | | | | |
|---|---|---|---|---|
| **Evidence Rating:** | Low ☐ | Medium ☐ | | High ☑ |
| **Non-Conformance:** | Critical ☐ | Major ☐ | Minor ☐ | None ☑ |
| **Summary Evidence:**<br>**Measures to minimize or mitigate ecosystem issues identified include technical measures such as the use of night settings, trailing balloons, scare lines and weighted lines in longline fisheries, the trial of bycatch reduction devices in gillnet fisheries, the use of flying doors and rock hoppers on bottom trawlers, and real time, temporary and permanent areal closures, and, where appropriate, the specific consideration of predation in some stock assessments as is the case in the assessment of capelin which considers the cod-capelin predator-prey relationship.** | | | | |
| **Evidence:**<br>Icelandic government policy aims to protect vulnerable marine ecosystems from significant adverse impact from bottom contacting gear and legislation exists to provide for the prohibition of fishing activities with bottom-contacting gear in areas where vulnerable ecosystems occur. MFRI Advice includes a specific section on the ecosystem impacts of Icelandic fisheries[442]. The document identifies the major regional pressures for the ecoregion (Figure below). | | | | |

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

[442] https://www.hafogvatn.is/static/files/Veidiradgjof/vistkerfi.pdf

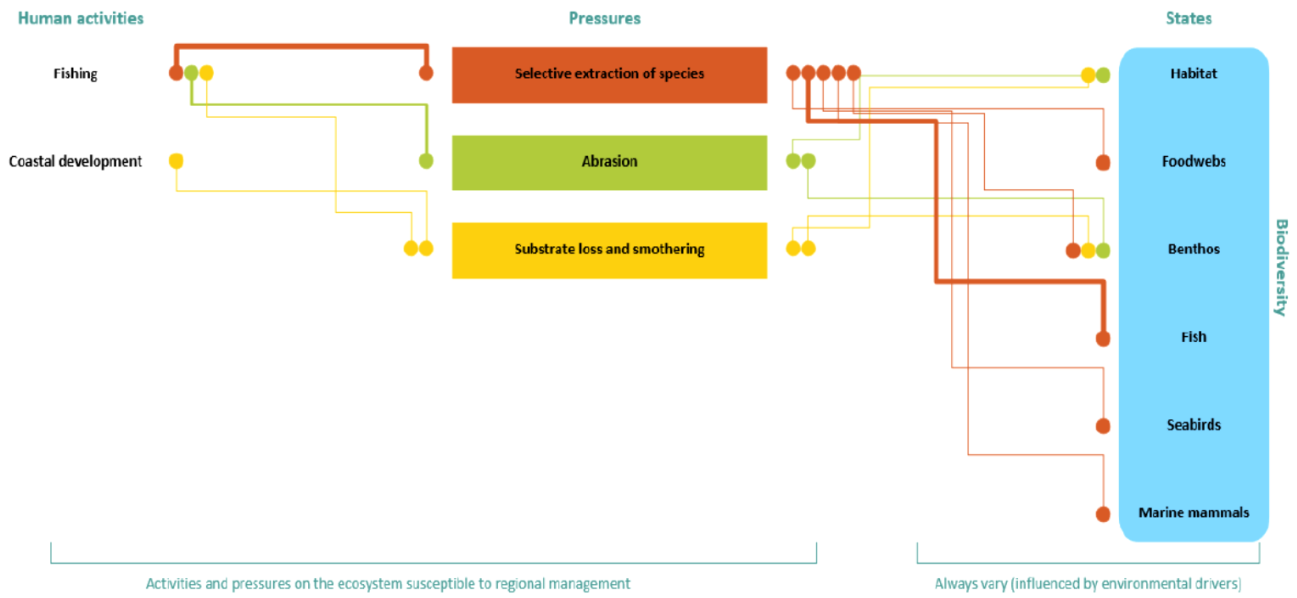



**Figure 77.** Icelandic Waters ecoregion overview with the major regional pressures, human activities, and state of the ecosystem components. The width of lines indicates the relative importance of individual links (the scaled strength of pressures should be understood as a relevant strength between the human activities listed and not as an assessment of the actual pressure on the ecosystem).

Measures to minimize or mitigate ecosystem issues identified include technical measures such as the use of night settings, trailing balloons, scare lines and weighted lines in longline fisheries, the trial of bycatch reduction devices in gillnet fisheries, the use of flying pelagic doors[443] and rock hoppers on bottom trawlers, and real time, temporary and permanent areal closures (see clause 3.2.3.1 for details), and, where appropriate, the specific consideration of predation in some stock assessments as is the case in the assessment of capelin which considers the cod-capelin predator-prey relationship.

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

| **References:** | See footnotes. |
|---|---|
| **Non-Conformance Number (if relevant)** | **NA** |

[443] https://www.government.is/topics/business-and-industry/fisheries-in-iceland/fisheries-management/

# 11. External Peer Review

This fishery assessment was peer reviewed in December 2019 by three independent experts with expertise matching that of the assessment team and qualifications meeting IRFM Peer Review requirements. The Peer Reviewers were Dr. Lisa Borges, Dr. Geir Hønneland and Deirdre Hoare. Peer Review Team details have been provided in Appendix 2.

## 1.1. Peer Reviewer 1

### 1.1.1. General comments – Peer Reviewer 1

| Peer Reviewer Comments | Assessment Team Response |
|---|---|
| **General Comments** | |
| The report provides comprehensive and thus sufficient information to make a decision in a majority of clauses, and generally support the conclusions reached. However, there are a few clauses where the information provided is not sufficient to support the conclusion reached.<br><br>Revision of the spelling of a few terms throughout the report is needed: longline, bycatch, gillnets, logbooks. Also, detailed information of the longline fishery operation would be important: what depth is longline deep-water operating? Is there any sharks bycatch?<br><br>Another aspect of the report is that there are a couple of strong statements made that can have implications in the conclusions reached, but these are not reflect in that conclusion and not explained or provided a context for. An example is the statement regarding ICES fishing opportunity advice is “changed and expanded” by IMFR, or that TAC decisions follow the HCR except when there are “strong reasons” not to do so. | Comments acknowledged. We have added some relevant information in the background section of the report. See the following individual responses for details.<br><br>Most of the cod catch is caught with longlines operating at depth of 50-250 m. This information has been included in the background section. Yes, there is elasmobranch bycatch, and this has been assessed under clause 3.1.1.<br><br>On the example regarding the ICES advice statement: the expression used is 'modified and extended if necessary' where 'if necessary' is the key message. This is explained in detail below in the response to Clause 1.1.3. comment. |

### 1.1.2. Scoring element review – Peer Reviewer 1

| Peer Reviewer Comments | Assessment Team Response |
|---|---|
| **Background Section** | |
| The Background section has detailed information that allows for an understanding of the fishery, its management system, stock status and associated research. Information that is lacking is that local fisheries, although they do not belong to the ITQ system, a part of the overall TAC is allocated to them. And also that there are costal fisheries that are outside the TAC system and are managed through an effort system. This information is only found in the | Comments acknowledged. We agree with most of the reviewer’s comments and note that, here, individual clauses are regarded as the formal assessment, and the background section is more of a brief introduction to the fishery.<br><br>We also agree with the points made about the extensive nature of the evidence provided in |

| | |
|---|---|
| scoring tables. Furthermore, background information on ecosystem impacts is comprehensively given in clause 3.1.1 but not in the background section, and is repeated in subsequent clauses. It would be more applicable and easier to read if the correct information is given at each clause. | Clause 3.1.1. This is because the clause' requirement is general and as such, is assessed extensively, with elements that are then summarised in later clauses, as required. |

1.1.2.1. **Section 1 – Fisheries Management**

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **1.1** | **The Fisheries Management System** | |
| **1.1.1** | | |
| **1.1.2** | | |
| **1.1.3** | How are TACs set? *"ICES formulates an advice based on the harvest rule and the result of the assessment. This advice is taken over by MFRI, modified and extended if necessary and presented as the scientific advice to the Ministry.* What is done in this process? The international peer-reviewed advice, that is reached with the contribution of all research institutes involved, is then taken by a national research institute and is then "*modified and extended*" to provide advice to the Ministry. This seems as an opportunity to bias scientific advice to national interests<br>. | **The process of setting the TAC**<br>According to Icelandic legislation, the responsible authority is the Ministry, and the MFRI is the formal advisor (see Clause 1.1.1 and 1.5.1). ICES is consulted and provides useful feedback and support, but the task of setting a TAC is not outsourced to ICES. MFRI knows the stocks very well, takes part in the assessment with methods developed by them, and has a very high scientific standing. Normally, the MFRI agrees with what ICES concludes and provides its advice accordingly, but if ICES makes errors, misunderstandings or unwise decisions, or if the stock develops in a way that was not foreseen, it is the MFRI's responsibility to provide the decision makers with their best advice.<br>When harvest rules have been established, the Ministry recognizes an obligation to set the TAC accordingly. So far, there are no examples of discarding the work by ICES for stocks where harvest rules are in effect. Since the implementation of the FMP in 2010, the national TAC for cod has been set in line with scientific advice, although small catches by foreign vessels have not been subtracted in all years.<br><br>This clarification has been added to the evidence for this clause. |
| **1.1.4** | | |
| **1.1.5** | Again,*"ICES formulates an advice based on the harvest rule and the result of the assessment. This advice is taken over by MFRI, modified and extended if necessary and presented as the scientific advice to the Ministry."* The transparency that existed in the international peer-reviewed ICES advice is deleted trough that advice being "*extended and modified*" by | Several mechanisms exist for ensuring transparency. The assessment and advice by ICES, as well as the advice from MFRI including quite extensive data beyond what ICES provides are publicly available on the internet once they are ready. The Ministry consults with interested parties before the final quotas are decided. Environmental NGOs, the general public and other potentially interested parties have full access to information generated by management organisation and a number of opportunities to interface with them through existing meeting and arrangements. |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| | MFRI. This process of adapting ICES advice needs to clear and transparent.<br><br>There are also no details on how environmental NGOs and the general public have access to the decisions taken by managers. | This clarification has been added to the evidence for this clause. |
| **1.1.6** | | |
| **1.1** | **The Fisheries Management Plan** | |
| **1.1.7** | "In 2015, the plan was extended until 2020." Will the plan continue past 2020? | A revision is planned for 2020 or 2021. So far, there are no indications that the plan will change.<br><br>This clarification has been added to the evidence for this clause. |
| **1.1.8.1** | | |
| **1.1.8.2** | | |
| **1.1.8.3** | . | |
| **1.1.8.4** | | |
| **1.1.9.1** | It would be useful to have the HCR formula explicitly detailed in the text. | See clause 1.1.9. Some formulas that appear in official documents were found to have mistakes, but only for the case where SSB is below the trigger. Above Btrigger the HCR formula is TACy/y+1 = (0.20 ∗ B 4+,y + TAC y−1/y )/2<br><br>This clarification has been added to the evidence for this clause. |
| **1.1.9.2** | | |
| **1.1.9.3** | | |
| **1.1.9.4** | | |
| **1.1.10.1** | | |
| **1.1.10.2** | | |
| **1.1.10.3** | | |
| **1.1.10.4** | | |
| **1.1.10.5** | | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 1.1.10.6 | | |
| 1.1.10.7 | | |
| 1.2 | **Research and Assessment** | |
| 1.2.1 | | |
| 1.2.2 | | |
| 1.2.3 | | |
| 1.2.4.1 | | |
| 1.2.4.2 | | |
| 1.2.4.3 | Are catches from fisheries excluded from the ITQ system reported and sampled? | All catches have to be landed in approved harbours and weighed by authorized staff. Sampling does not discriminate catches under the ITQ system and other catches.<br><br>This clarification has been added to the evidence for this clause. |
| 1.2.5 | | |
| 1.2.6 | | |
| 1.2.7 | | |
| 1.3 | **The Precautionary Approach** | |
| 1.3.1.1 | | |
| 1.3.1.2 | | |
| 1.3.1.3 | | |
| 1.3.1.4 | The statement "*Further measures would depend on the reason why the SSB became reduced.*" is puzzling as regardless of the reason why stock biomass could decrease, a stock that has very low biomass cannot sustain the same level of exploitation. | Agree, but apart from reducing the catches, other measures may be necessary, depending very much on why the stock is reduced. For example: is there a management problem or is this an effect of an altered ecosystem? The statement in the report was made to indicate that it is not straightforward to plan (and simulate) exactly which measures should be taken, or to evaluate their effect. |
| 1.3.1.5 | | |
| 1.3.1.6 | | |
| 1.3.2 | **Management Targets and Limits** | |
| 1.3.2.1 | **Harvesting rate and fishing mortality** | |
| 1.3.2.1.1 | | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 1.3.2.1.2 | | |
| 1.3.2.2 | **Stock biomass** | |
| 1.3.2.2.1 | | |
| 1.3.2.2.2 | | |
| 1.3.2.2.3 | | |
| 1.3.2.2.4 | | |
| 1.3.2.3 | **Stock biology and life-cycle (structure and resilience)** | |
| 1.3.2.3.1 | | |
| 1.3.2.3.2 | | |
| 1.3.2.3.3 | | |
| 1.4 | **External Scientific Review** | |
| 1.4.1 | | |
| 1.4.2 | Apart from the issues arisen from the statement "*The MFRI advice generally follows the ICES advice unless there is strong reasons to deviate from it*" that I referred before, here the information requested is about revision of the harvesting policy (i.e. the management plan) and not necessarily on the annual advice given, so this reference should be removed. | Agree. The reference should be to the 2015 benchmark, not the 2019 TAC advice: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKICE%202015/wkice_2015_final.pdf<br><br>This edit has been made to the evidence for this clause. |
| 1.5 | **Advice and Decisions on TAC** | |
| 1.5.1 | | |
| 1.5.2 | | |
| 1.5.3 | | |
| 1.5.4 | | |
| 1.5.5 | "*The Ministry has the authority to deviate from the advice, but will only do so if there is strong reasons for that*". This statement makes a strong case against the requirement that "The competent fisheries management authority shall decide on TAC within the boundaries set by the adopted harvesting policy". | Clarification already provided. See Clause 1.1.3. |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| | More explanation is needed to justify the evidence rating assigned**.** | |
| **1.5.6** | | |
| **1.5.7** | | |
| **1.5.8** | Recommendation is appropriate. | Comment acknowledged. |
| **1.5.9** | | |
| **1.5.10** | | |

1.1.2.2. **Section 2 – Compliance and Monitoring**

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **2.1** | **Implementation, Compliance, Monitoring, Surveillance and Control** | |
| **2.1.1** | | |
| **2.1.2** | | |
| **2.2** | **Concordance between actual Catch and allowable Catch** | |
| **2.2.1** | | |
| **2.2.2** | | |
| **2.2.3** | | |
| **2.2.4.1** | | |
| **2.2.4.2** | | |
| **2.2.4.3** | | |
| **2.3** | **Monitoring and Control** | |
| **2.3.1** | **Vessel registration and catch quotas** | |
| **2.3.1.1** | | |
| **2.3.1.2** | | |
| **2.3.1.3** | | |
| **2.3.1.4** | | |
| **2.3.2** | **Fishing vessel monitoring and control systems** | |
| **2.3.2.1** | | |
| **2.3.2.2** | | |
| **2.3.2.3** | | |
| **2.3.2.4** | #1 Medium evidence rating with a minor non-conformity regarding recording of marine mammals and seabirds. | Correct. Comment acknowledged. |
| **2.3.2.5** | | |
| **2.3.2.6** | | |
| **2.3.2.7** | | |
| **2.3.2.8** | | |
| **2.3.2.9** | | |
| **2.3.2.10** | | |
| **2.3.2.11** | | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 2.3.2.12 | | |
| 2.3.2.13 | | |
| 2.3.2.14 | | |
| 2.3.2.15 | | |
| 2.3.2.16 | | |
| 2.3.2.17 | | |
| 2.3.3 | Catches are subtracted from relevant quotas | |
| 2.3.3.1 | | |
| 2.3.3.2 | | |
| 2.3.3.3 | | |
| 2.3.3.4 | | |
| 2.3.3.5 | | |
| 2.3.4 | Rules are enforced | |
| 2.3.4.1 | | |
| 2.3.5 | Analysis is carried out | |
| 2.3.5.1 | | |
| 2.3.5.2 | | |
| 2.3.5.3 | | |

1.1.2.3. **Section 3 – Ecosystem Considerations**

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **3.1** | **Guiding Principle** | |
| **3.1.1** | #2 Medium evidence rating with a minor non-conformity regarding the impact on spotted wolfish and common loon, which I agree. But what are the measures in place to avoid catches of common skate? There is a mandatory release of all viable Atlantic halibut caught as bycatch in other fisheries, so why not the same measures in common skate, as it is listed as Critically Endangered under the IUCN Red list? Are there any closures for VMEs protection (except for the very small deep-water coral and hydrothermal vent)? Finally, there is no Non-Conformance Number at the end of the table. | **Common skate**<br>No TAC is available for this species because there is no directed fishery for it. It is only caught as bycatch in mainly longline, bottom trawl and Danish seine gear. Total catch of skate in Icelandic waters in 2017/18 was 139 tonnes, very close to the 10 years average.<br><br>MFRI is monitoring the incidences of capture and distribution of skate during the spring bottom trawl survey as they have been doing since the survey began in 1985. In addition, catches in commercial fisheries will continue to be collected and the MFRI will monitor whether significant changes either the survey results or the level of landed catches occur. Numbers in the spring survey have been increasing steadily since the 1990s potentially showing some signs of improvement (albeit with a high degree of uncertainty). Dipturus spp. abundance in EU Waters has also shown some increases in recent surveys.<br><br>As noted in the clause, we also highlight that the IUCN assessment in now quite outdated (i.e. 2006) and that in recent years, a taxonomic revision of *Dipturus batis* was made due to the discovery of two *Dipturus* species. See evidence in clause 3.1.1 for further details.<br><br>Notwithstanding the above, the Assessment Team agrees with the Peer Reviewer that more explicit management measures would likely be beneficial for |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| | | grey skate. Accordingly, a new Recommendation has been issued for client consideration.<br><br>**Recommendation #2 (relating to clause 3.1.1).** The Assessment Team recommends that Grey skate (Dipturus spp.), a Critically Endangered Species listed in the IUCN Red list, are afforded more explicit/directed management measures to ensure that the current bycatch levels resulting from longline, bottom trawl and Danish seine fisheries in Icelandic waters do not negatively affect the recovery of this species.<br><br>**VMEs protection**<br>Regarding VMEs, we note that the IRF standard is only specific to management measures relating to coral areas and hydrothermal vents. However, the Assessment Team agrees with the Peer Reviewer and notes that a recommendation regarding this issue has also been presented to the client.<br><br>**Recommendation #3 (relating to clause 3.1.1 and 3.1.2)**<br>Several fisheries management plans (e.g. those for cod, haddock, saithe and redfish) state that it is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs). VMEs of particular importance within Iceland include cold water coral communities and hydrothermal vent areas, but also deep-sea sponge aggregations (a threatened and declining habitat, |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| | | according to OSPAR[444]) and sea-pen fields[445]. 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.<br><br>Finally, the missing Non-Conformance number# at the end of clause 3.1.1 scoring box has been now added. |
| **3.1.2** | Missing a discussion of common skate and corrective management measures. Therefore the information presented does not support the evidence rating assigned. | This clause has been updated with the information on grey skate summarised in the response above. The original evidence rating remains. |
| **3.2** | **Specific Criteria** | |
| **3.2.1** | **Information gathering and advice** | |
| **3.2.1.1** | | |
| **3.2.1.2** | | |
| **3.2.2** | **By-catch and discards** | |
| **3.2.2.1** | | |
| **3.2.2.2** | | |
| **3.2.2.3** | | |
| **3.2.2.4** | Again no reference to common skate measures that should be in place. Therefore the information presented does not support the evidence rating assigned. | This clause has been updated with the information on grey skate summarised in the response to 3.1.1. The original evidence rating remains. |
| **3.2.2.5** | | |
| **3.2.3** | **Habitat Considerations** | |
| **3.2.3.1** | | |

[444] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/Ecosystem_overview-Icelandic_Waters_ecoregion.pdf
[445] https://novasarc.hafogvatn.is/project/

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 3.2.3.2 | | |
| 3.2.3.3 | | |
| 3.2.3.4 | | |
| 3.2.4 | Foodweb Considerations | |
| 3.2.4.1 | | |
| 3.2.5 | Precautionary Considerations | |
| 3.2.5.1 | | |

### 1.1.3. Conclusion – Peer Reviewer 1

As stated above, the report provides relevant and comprehensive information to make a decision in a majority of clauses, and support the conclusion reached. The non-conformances raised are appropriate and the Corrective Action Plan is appropriate and likely to address the non-conformance within the specified timeframe.

Assessment Team response: comments acknowledged.

## 1.1. Peer Reviewer 2

### 1.1.1. General comments – Peer Reviewer 2

| Peer Reviewer Comments | Assessment Team Response |
|---|---|
| **General Comments** | |
| A very careful analysis of the criteria has been carried out by the assessment team. Well presented and comprehensive evidence is supplied in the report to illustrate all points. In general Icelandic fisheries are exceptionally well managed in terms of both short and long term objectives. However, I have to agree with the non- conformance regarding the non-reporting/under- reporting of seabirds and marine mammal bycatch, and also the non-conformance regarding the lack of data for the spotted wolfish and common loon. The recommendation for more formal conservation plans/measure for sponges and sea-pens is appropriate. | Assessment Team response: comments acknowledged. |

### 1.1.2. Scoring element review – Peer Reviewer 2

| Peer Reviewer Comments | Assessment Team Response |
|---|---|
| **Background Section** | |
| This is a good overview of the stock biology, the fishery and the management, it is well written and logical. I see no areas that require further clarification, only points where there may be scope for improving the text. One improvement I would propose is more detail being place in the background section leaving the evidence sections to justify the evidence ratings. A lot of information is repeated though various evidence sections. | Assessment Team response: comments acknowledged. |

### 1.1.2.1. Section 1 – Fisheries Management

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **1.1** | **The Fisheries Management System** | |
| **1.1.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.4** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.5** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.6** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1** | **The Fisheries Management Plan** | |
| **1.1.7** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.8.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.8.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.8.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.8.4** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.9.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.9.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.9.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.9.4** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.10.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.10.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.10.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.10.4** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.10.5** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.10.6** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.1.10.7** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2** | **Research and Assessment** | |
| **1.2.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.4.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.4.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.4.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.5** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.6** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **1.2.7** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 1.3 | **The Precautionary Approach** | |
| 1.3.1.1 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.1.2 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.1.3 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.1.4 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.1.5 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.1.6 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2 | **Management Targets and Limits** | |
| 1.3.2.1 | **Harvesting rate and fishing mortality** | |
| 1.3.2.1.1 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.1.2 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.2 | **Stock biomass** | |
| 1.3.2.2.1 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.2.2 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.2.3 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.2.4 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.3 | **Stock biology and life-cycle (structure and resilience)** | |
| 1.3.2.3.1 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.3.2 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.3.2.3.3 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.4 | **External Scientific Review** | |
| 1.4.1 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.4.2 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5 | **Advice and Decisions on TAC** | |
| 1.5.1 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.2 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.3 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.4 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.5 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.6 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.7 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.8 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.9 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| 1.5.10 | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |

### 1.1.2.2. Section 2 – Compliance and Monitoring

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **2.1** | **Implementation, Compliance, Monitoring, Surveillance and Control** | |
| **2.1.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.1.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.2** | **Concordance between actual Catch and allowable Catch** | |
| **2.2.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.2.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.2.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.2.4.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.2.4.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.2.4.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3** | **Monitoring and Control** | |
| **2.3.1** | **Vessel registration and catch quotas** | |
| **2.3.1.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.1.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.1.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.1.4** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2** | **Fishing vessel monitoring and control systems** | |
| **2.3.2.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.4** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.5** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.6** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.7** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.8** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.9** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.10** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.11** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.12** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.13** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.14** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.15** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.16** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.2.17** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **2.3.3** | **Catches are subtracted from relevant quotas** | |
| **2.3.3.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.3.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.3.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.3.4** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.3.5** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.4** | **Rules are enforced** | |
| **2.3.4.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.5** | **Analysis is carried out** | |
| **2.3.5.1** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.5.2** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |
| **2.3.5.3** | <Insert (if comment is not required then you can leave blank or mark as N/A)> | |

### 1.1.2.3. Section 3 – Ecosystem Considerations

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **3.1** | **Guiding Principle** | |
| **3.1.1** | The info on the MFRI and environmental conditions would be better placed in the background section.<br><br>Annual take of marine mammals as a percentage of their population size such as with the harbour porpoise, would be much more useful information (where available) than solely numbers of animals taken as bycatch. | Assessment Team response: comments acknowledged. The information has been moved to the background.<br><br>We agree with the comment. Where population size of marine mammals were available, these have been provided. In the case of harbour purpose less precise information was available. In 2016 an aerial survey was performed. Despite the poor coverage in it, the uncorrected harbour porpoise population estimate is at least double that of all previous estimates other than that from 2007, when a specialist harbour porpoise observer was employed and all known biases were corrected. Availability bias is likely substantial for this species but dive profile data from the survey area are lacking[446]. This data, although not definitive at this point, appears to imply that the harbour porpoise is increasing and as such, may not be below biological limits. |
| **3.1.2** | The monitoring plan for the spotted wolffish is likely provide sufficient data to evaluate the effects of the cod fishery.<br>Pg 238 lists the 'US Marine Mammal Protection Act importing requirements' under the Icelandic Committee for Consultation on Responsible Management of Living Marine Resources' recommendation to the Ministry. It is not clear what is meant by this, more detail could be provided. | The MMPA Import Provisions rule implements aspects of the Marine Mammal Protection Act that aim to reduce marine mammal bycatch associated with international commercial fishing operations, by requiring nations exporting fish and fish products to the United States to be held to the same standards as U.S. commercial fishing operations, starting from 2021. All in all, this importing rule is thought to be pushing Iceland to further decrease marine mammal bycatch and improve the management of these animals. |
| **3.2** | **Specific Criteria** | |
| **3.2.1** | **Information gathering and advice** | |
| **3.2.1.1** | N/A | |

[446] https://nammco.no/wp-content/uploads/2018/09/report_aewg_2018_final.pdf

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 3.2.1.2 | N/A | |
| 3.2.2 | **By-catch and discards** | |
| 3.2.2.1 | N/A | |
| 3.2.2.2 | N/A | |
| 3.2.2.3 | I don't see the evidence to justify that the species named in the table are not threatened by the cod fishery, percentages of catch is shown. All these species are assessed under 3.1.1, it would be better to list whether it is likely that these species are above the point of recruitment impairment or not in the table provided. | This clause deals with bycatch rather than endangered or threatened species (assessed elsewhere). The analysis for all the species reported in the table mentioned has been carried out under clause 3.1.1. None of these species is considered to be significantly affected by the cod fishery. However, we note the issue of spotted wolfish bycatch which is been addressed through a corrective action plan. |
| 3.2.2.4 | N/A | |
| 3.2.2.5 | N/A | |
| 3.2.3 | **Habitat Considerations** | |
| 3.2.3.1 | N/A | |
| 3.2.3.2 | N/A | |
| 3.2.3.3 | N/A | |
| 3.2.3.4 | N/A | |
| 3.2.4 | **Foodweb Considerations** | |
| 3.2.4.1 | N/A | |
| 3.2.5 | **Precautionary Considerations** | |
| 3.2.5.1 | N/A | |

### 1.1.3. Conclusion – Peer Reviewer 2

I agree with the conclusion of the assessment team based on the evidence presented in the assessment report, that the fishery should be certified.

Where non-conformances requiring corrective actions on behalf of the fishery have been raised, for each such non-conformance, please provide:

- An indication of whether or not you believe the non-conformances are appropriate.
- An indication of whether or not you believe the Corrective Action Plan is appropriate and likely to address the non-conformance within the specified timeframe.

**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.

From the evidence supplied it is clear that under-reporting of seabirds and marine mammals is occurring, therefore the minor non-conformance is appropriate.

The Corrective Action Plan is appropriate especially with regards to the technology and training of fishermen, which will help to inform and deliver. I believe the timeframe is reasonable to address the non-conformance but ongoing training of fishermen would help with continued success.

**Non-conformance #2 (Clause 3.1.1: Minor Non-conformance).** There is insufficient evidence that adverse impacts of the cod fishery on the following ecosystem components:

1) Spotted wolffish, and;
2) Common loon

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

From the evidence supplied it is clear that there is a lack of data on the spotted wolffish. The Corrective Action Plan is appropriate with a monitoring plan for spotted wolf fish to be implemented which should considerably improve the data available. The evidence supplied also shows that analysis is already underway on the data collected on the common loon and results from this will better inform milestones to close this minor non-conformance.

Assessment Team response: comments acknowledged.

## 1.2. Peer Reviewer 3

### 1.2.1. General comments – Peer Reviewer 3

| Peer Reviewer Comments | Assessment Team Response |
|---|---|
| **General Comments** | |
| I find this report to be very well-researched and well-written; it is obvious that it builds on extensive previous knowledge about Icelandic fisheries management among the members of the Assessment Team. My own competence lies within management, enforcement and compliance, so this has been my focus in reviewing the report. I have a few specific comments and questions to the Assessment team (see below), but by and large the information provided on enforcement and compliance is very detailed and clearly presented. Also, I fully agree with the Team's conclusions.<br><br>I haven't proofread the report, but it's generally rather 'clean'. Ideally, the Team should attempt to make the use of names of the management bodies consistent. Fisheries Directorate/Fishing Directorate/Directorate of Fisheries are used in different parts of the report; Coast Guard/Coastguard/coastguard and MRI/MFRI likewise. | Assessment Team response: comments acknowledged. |

### 1.2.2. Scoring element review – Peer Reviewer x

| Peer Reviewer Comments | Assessment Team Response |
|---|---|
| **Background Section** | |
| | |

### 1.2.2.1. Section 1 – Fisheries Management

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **1.1** | **The Fisheries Management System** | |
| **1.1.1** | 'Policies incorporate a number of International Agreements.' To be very formalistic, the legal instruments listed include both agreements (which equals treaty, i.e. is legally binding) and declarations (which are non-binding). So I would say '…international agreements and declarations'. | Comments acknowledged. Changes made to the text. |
| **1.1.2** | | |
| **1.1.3** | | |
| **1.1.4** | | |
| **1.1.5** | There is an emphasis on transparency in the scientific process here although the Directorate's public overview of catches and quota status is also mentioned. Is it worth mentioning that also infringements are made publicly available? The publication of information on every inspection and infringement is rather extraordinary. It is mentioned under Section 2 but also belongs in the wider picture. | Comments acknowledged. Changes made to the text. |
| **1.1.6** | | |
| **1.1** | **The Fisheries Management Plan** | |
| **1.1.7** | | |
| **1.1.8.1** | | |
| **1.1.8.2** | | |
| **1.1.8.3** | | |
| **1.1.8.4** | | |
| **1.1.9.1** | | |
| **1.1.9.2** | | |
| **1.1.9.3** | | |
| **1.1.9.4** | | |
| **1.1.10.1** | | |
| **1.1.10.2** | | |
| **1.1.10.3** | | |
| **1.1.10.4** | | |
| **1.1.10.5** | | |
| **1.1.10.6** | | |
| **1.1.10.7** | | |
| **1.2** | **Research and Assessment** | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 1.2.1 | | |
| 1.2.2 | | |
| 1.2.3 | | |
| 1.2.4.1 | | |
| 1.2.4.2 | | |
| 1.2.4.3 | | |
| 1.2.5 | | |
| 1.2.6 | | |
| 1.2.7 | | |
| 1.3 | The Precautionary Approach | |
| 1.3.1.1 | | |
| 1.3.1.2 | | |
| 1.3.1.3 | | |
| 1.3.1.4 | | |
| 1.3.1.5 | | |
| 1.3.1.6 | | |
| 1.3.2 | Management Targets and Limits | |
| 1.3.2.1 | Harvesting rate and fishing mortality | |
| 1.3.2.1.1 | | |
| 1.3.2.1.2 | | |
| 1.3.2.2 | Stock biomass | |
| 1.3.2.2.1 | | |
| 1.3.2.2.2 | | |
| 1.3.2.2.3 | | |
| 1.3.2.2.4 | | |
| 1.3.2.3 | Stock biology and life-cycle (structure and resilience) | |
| 1.3.2.3.1 | | |
| 1.3.2.3.2 | | |
| 1.3.2.3.3 | | |
| 1.4 | External Scientific Review | |
| 1.4.1 | | |
| 1.4.2 | | |
| 1.5 | Advice and Decisions on TAC | |
| 1.5.1 | | |
| 1.5.2 | | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 1.5.3 | | |
| 1.5.4 | | |
| 1.5.5 | | |
| 1.5.6 | | |
| 1.5.7 | | |
| 1.5.8 | | |
| 1.5.9 | | |
| 1.5.10 | | |

### 1.2.2.2. Section 2 – Compliance and Monitoring

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| **2.1** | **Implementation, Compliance, Monitoring, Surveillance and Control** | |
| **2.1.1** | - The National Audit Office's December 2018 report has caused some discussions in MSC circles. I fully agree with how the team here deals with it.<br><br>- In the overview of offences in Table 10, by far the most frequently recorded offence is 'fishing in excess of or without a quota' (approx. 1000-1200 per year in 2016-2018; the similar figure for most other categories of offenses is far below 100). Not only is this a high figure; fishing in excess of or without a quota is also a very serious infringement, so it sounds rather dramatic. As I understand the assessment team, the high number 'relates to each incidence detected of vessels that have taken longer than the 3 days required by law to balance their quota where they have landed fish in excess of their quota.' Can we rest assured that there isn't any hidden overfishing here?<br><br>- The instances of fees imposed for illegal catches increased nearly tenfold from 2016 to 2017/2018 – any particular reason? | Comments acknowledged. Yes, it is correct, the high number relates to each incidence detected of vessels that have taken longer than the 3 days required by law to balance their quota to their catches. The reason for the 2016/17 to 2017/18 increase is that Directorate of Fisheries decided to clamp down on the small boat fishers that were more than 3 days late at balancing their quotas. The instances of fees imposed for illegal catches relates directly to the previous point. |
| **2.1.2** | | |
| **2.2** | **Concordance between actual Catch and allowable Catch** | |
| **2.2.1** | | |
| **2.2.2** | | |
| **2.2.3** | | |
| **2.2.4.1** | | |
| **2.2.4.2** | | |
| **2.2.4.3** | | |
| **2.3** | **Monitoring and Control** | |
| **2.3.1** | **Vessel registration and catch quotas** | |
| **2.3.1.1** | | |
| **2.3.1.2** | | |
| **2.3.1.3** | | |
| **2.3.1.4** | | |
| **2.3.2** | **Fishing vessel monitoring and control systems** | |
| **2.3.2.1** | | |
| **2.3.2.2** | | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 2.3.2.3 | | |
| 2.3.2.4 | | |
| 2.3.2.5 | | |
| 2.3.2.6 | The assessment team says that inspectors compare reported catch with catch stored on board. Does this include a full physical check of the catch in the holds (e.g. counting of boxes/containers and weighing of a sample)? | Comments acknowledged. Yes, that is correct. |
| 2.3.2.7 | 'The discard ban has some inbuilt flexibility, as any 5% of demersal catches from a fishing trip (called VS catch), irrespective of fish species or size, may be excluded from quota restriction (which means that VS catches are additional to the TAC).' Does this in practice imply that all vessels automatically get a 5 % addition to their quota, i.e. that the effective TAC is 5 % higher than the declared TAC? (That said, I understand the logic behind this arrangement.) | Comments acknowledged. No, this does not mean that vessels have an additional 5% of catches added to their catches. On sale of VS catches in public fish markets 20% of the revenue generated is paid to the vessel with the remaining 80% going to a designated research and development fund (the Fisheries Commission Project or 'VS fund', under the auspices of the Ministry). The maximum of 20% return on VS catches means that there are limited incentives to land it; however, having the VS catch provisions within the fisheries management system allows the flexibility for vessels to land small catches which are outside their specific quota, preventing discards, improving the treatment of the fishery resource and promoting more responsible fishing practices. |
| 2.3.2.8 | | |
| 2.3.2.9 | | |
| 2.3.2.10 | | |
| 2.3.2.11 | | |
| 2.3.2.12 | | |
| 2.3.2.13 | | |
| 2.3.2.14 | | |
| 2.3.2.15 | | |
| 2.3.2.16 | | |
| 2.3.2.17 | | |
| 2.3.3 | **Catches are subtracted from relevant quotas** | |
| 2.3.3.1 | | |
| 2.3.3.2 | | |
| 2.3.3.3 | | |

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 2.3.3.4 | | |
| 2.3.3.5 | | |
| 2.3.4 | Rules are enforced | |
| 2.3.4.1 | | |
| 2.3.5 | Analysis is carried out | |
| 2.3.5.1 | | |
| 2.3.5.2 | | |
| 2.3.5.3 | | |

### 1.2.2.3. Section 3 – Ecosystem Considerations

| # | Peer Reviewer Comments | Assessment Team Response |
|---|---|---|
| 3.1 | Guiding Principle | |
| 3.1.1 | | |
| 3.1.2 | | |
| 3.2 | Specific Criteria | |
| 3.2.1 | Information gathering and advice | |
| 3.2.1.1 | | |
| 3.2.1.2 | | |
| 3.2.2 | By-catch and discards | |
| 3.2.2.1 | | |
| 3.2.2.2 | | |
| 3.2.2.3 | | |
| 3.2.2.4 | | |
| 3.2.2.5 | | |
| 3.2.3 | Habitat Considerations | |
| 3.2.3.1 | | |
| 3.2.3.2 | | |
| 3.2.3.3 | | |
| 3.2.3.4 | | |
| 3.2.4 | Foodweb Considerations | |
| 3.2.4.1 | | |
| 3.2.5 | Precautionary Considerations | |
| 3.2.5.1 | | |

### 1.2.3. Conclusion – Peer Reviewer 3

Please provide an overall conclusion including:

- An indication of whether or not you believe the conclusion of the Assessment Team is appropriate conclusion based on the evidence presented in the assessment report.

The conclusions of the assessment team are appropriate based on the evidence presented in the report.

Where non-conformances requiring corrective actions on behalf of the fishery have been raised, for each such non-conformance, please provide:

- An indication of whether or not you believe the non-conformances are appropriate.
- An indication of whether or not you believe the Corrective Action Plan is appropriate and likely to address the non-conformance within the specified timeframe.

The non-conformances and the Corrective Action Plan are appropriate.

Assessment Team response: comments acknowledged.

## 12. Non-conformances and Corrective Actions

During this re-assessment audit all clauses but two were found to be in full conformance. One minor non-conformance was identified (during the 4th surveillance in 2018/19) against clause 2.3.2.4 of the IRFM Standard (V2), relating to the appropriate recording of marine mammal and seabird bycatch data in fishing logbooks, while a new minor non-conformance was identified during this re-assessment against clause 3.1.1 relative to the bycatch of spotted wolfish and common loon. Progress against these two NCs is shown below.

| **Non-conformance 1 (of 1)** | |
|---|---|
| **Clause:** | 2.3.2.4. Catch amounts by species and fishing area shall be estimated and continually recorded in fishing logbooks on-board the fishing vessels |
| **Non-conformance level:** | Minor Non-conformance |
| **Non-conformance:** | Although required by legislation, there is evidence of extensive non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks. |
| **Rationale:** | The recording of marine mammals and seabirds by number and species is required by Icelandic regulation[447]. Despite the implementation of new mandatory logbook reporting procedures for seabird and marine mammal bycatch, available evidence suggests that far fewer incidences of seabird and marine mammal bycatch are reported via the electronic logbook system than would be expected given the levels reported by onboard observers. This suggests significant levels of under-reporting and/or non-reporting of seabird and marine mammal bycatch. Examples of available evidence to support this conclusion include the findings of Pallson *et al.* 2015[448] and the March 2018 MFRI report titled: "Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017".<br><br>Pallson *et al.* 2015 highlighted the fact that their bycatch estimates were based on limited data that needed to be increased and improved with a functioning reporting system for the fishery and better follow up.<br><br>The MFRI 2018 report found that although reported bycatch in E-logbooks by the fleet has increased (suggesting better compliance with reporting requirements) the overall bycatch rates are still much lower than observed in the trips by inspectors. Overall, the marine mammal and seabird bycatch rate during inspector trips was around four times higher than reported by the fleet in 2017[449].<br><br>Furthermore according to a 2017 presentation to NAMMCO's Working group on bycatch of marine mammals; *"logbooks have unfortunately proven unreliable"* and *"bycatch of birds and marine mammals is 18x higher when observer is present vs logbook records"*.<br><br>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 |

[447] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967
[448] https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf
[449] https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

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| | addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better. |
| **Corrective Action Plan** | In accordance with rules of the IRF Programme, the Client is required to submit a Corrective Action Plan (CAP) within 28 days.<br><br>**The Client submitted the following CAP in February 2019** |

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).

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:

  

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| | Year 1: Ongoing work to further refine the actions identified above in terms of specific deliverables with their accompanying timeline;<br>Year 2: Initiate deliverable x, y, z identified in Year 1;<br>Year 3: Fully implement and report on progress;<br>Year 4: Continued implementation and reporting. |
| **Assessment Team CAP response** | **The Assessment Team has accepted the Corrective Action Plan provided by the Client for the fishery under assessment.** |
| **Year 1 progress** | **The Client Group submitted the following corrective action evidence in October 2019** |

To whom it may concern

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Reykjavík October 25, 2019
Reference: ANR19020189/15.09.00

Subject: Bycatches of non-commercial species in fisheries

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

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

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

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

On behalf of the Minister of Industry and Commerce

Jóhann Guðmundsson
Director General, Department of Fisheries and Aquaculture

  

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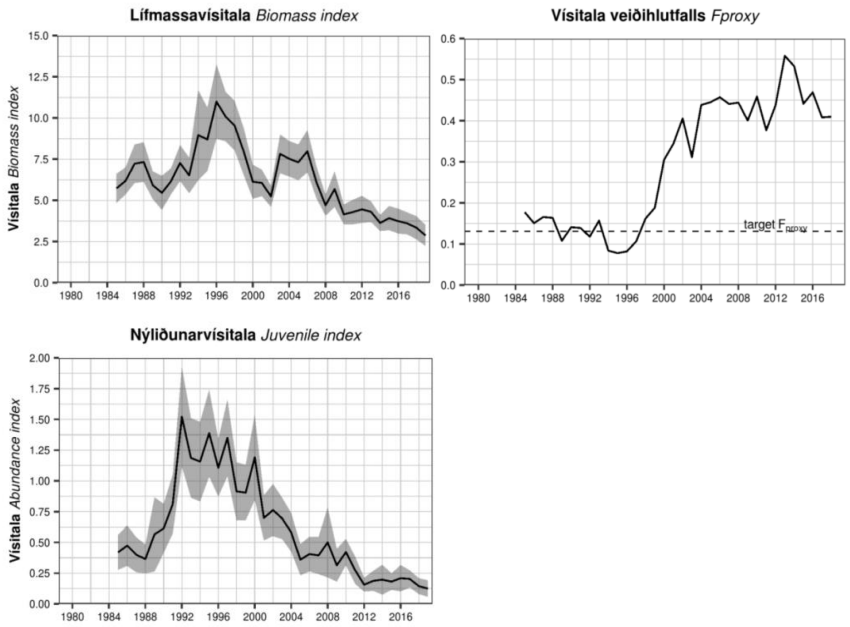
| | Following the letter supplied by the Ministry on October 25th 2019 to update on progress towards closure of Minor Non Conformance #1, the Client Group spoke in a conference call with the audit team lead and clarified the following information:<br><br>The Task Force group has just been set up and it is different and independent from the Committee for Consultation on Responsible Management of Living Marine Resources, reformed in its most current form (and remit) in Nov. 2018. The head of the Task Force is a high-level official in Iceland, the former Permanent Secretary for Fisheries.<br><br>The appointed Chair of the Committee for Consultation on Responsible Management of Living Marine Resources brings industry and management stakeholders together to gather information, explore options and seek consensus on what can be done and agreed in a practical sense, thus assisting in the official decision-making process. The Task Force is set to continue to collaborate directly with various stakeholders and to explore multiple options and solutions.<br><br>The Chairs of the Committee and the newly formed Task Force have been in contact to report on recent issues, developments and general updates and to discuss future options. The Client Group communicated that there is a proposed regulation on the table aiming to prohibit all deliberate killing of seals in Iceland (with only minor exception subject to strict conditions and requiring permit from the Directorate of Fisheries) which, if adopted, would contribute to a reduction in overall mortality and assist seal populations growth.<br><br>Furthermore, an important first step has been recognised as the need to improve social recognition and acceptance of the issues across the gillnet fisheries (for lumpfish and cod), currently considered at high risk.<br><br>The Client Group further communicated, on behalf of the head of the Task Force, that the small vessels bycatch recording App should be ready for the end of the year, prior to trial by a select group of fishermen. However, the full recording of seabird and marine mammal bycatch in the App may extend beyond the next (2020) fishing season. Meetings have been scheduled in late 2019 to further discuss the App with the Directorate.<br><br>Another action that is under consideration is the use of picture cards for gillnet fishermen to enable better identification of seals and seabirds and to investigate if additional forms to record bycatch are required in the small fleet.<br><br>The Task Force is also planning to conduct meetings with small boat owners to reiterate the need to improve data collection. The Directorate is also considering to hold educational meetings around Iceland prior to the start of the next season to increase awareness of the issue and the need for improved catch recording. |
| **Assessment Team Determination on Year-1 Corrective Evidence** | **The Assessment Team has determined that the information supplied is sufficient to meet the original CAP deliverable for year 1. The non-conformance remains open and on track towards appropriate closure.**<br><br>**The first surveillance activities will review evidence that the corrective actions highlighted above have been carried out.** |

<table>
<tr><th colspan="2">Non-conformance 2 (of 2)</th></tr>
<tr><td>Clause:</td><td>3.1.1. Adverse impacts of the fishery on the ecosystem shall be considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</td></tr>
<tr><td>Non-conformance level:</td><td>Minor Non-conformance</td></tr>
<tr><td>Non-conformance:</td><td>There is insufficient evidence that adverse impacts of the cod fishery on the following ecosystem components:<br>3) Spotted wolffish, and;<br>4) Common loon<br>are being considered and appropriately assessed and effectively addressed, consistent with the precautionary approach.</td></tr>
<tr><td>Spotted wolffish Rationale:</td><td>Around 98% of spotted wolffish (Anarhichas minor) is currently caught as bycatch in the trawl and longline fisheries that target cod and is mainly found in the northwest and north parts of the continental shelf of Iceland, on sandy or muddy substrate and depths of 100-400 meters, in fishing ground overlapping with those of cod. From 2002, the catch on longline has been increasing relative to that taken in demersal trawl. In 2018, longline catch was around 53% of the total catch.<br><br>Since 2012 catches have been consistently above advice/recommended TAC. Spotted wolffish was included in the ITQ system in 2018 and the TAC in 2018/2019 was set as per recommended TAC of 1001 t[2]. Issues surrounding this stock were flagged as a potential issue during the IRF cod 4th surveillance assessment in 2018, preceding the current re-assessment.<br><br>Preliminary catches in 2018/19 have exceeded the TAC based on Fiskistofa records[3].
<table>
<tr><th>Year</th><th>Advice/ Recommended TAC</th><th>National TAC</th><th>Spotted Wolffish Catches</th><th>Total catches as a % of advice</th></tr>
<tr><td>12/13</td><td>900</td><td></td><td>2,042</td><td>227%</td></tr>
<tr><td>13/14</td><td>900</td><td></td><td>2,250</td><td>250%</td></tr>
<tr><td>14/15</td><td>900</td><td></td><td>1,655</td><td>184%</td></tr>
<tr><td>15/16</td><td>900</td><td></td><td>1,913</td><td>213%</td></tr>
<tr><td>16/17</td><td>1128</td><td></td><td>1,587</td><td>141%</td></tr>
<tr><td>17/18</td><td>1080</td><td></td><td>1,528</td><td>141%</td></tr>
<tr><td>18/19</td><td>1001</td><td>1,001</td><td>1,234</td><td>123%</td></tr>
<tr><td>19/20</td><td>375</td><td>375</td><td></td><td></td></tr>
</table>
In a request for clarification, the Ministry confirmed that spotted wolffish is caught with other species in the mixed fishery and is therefore very difficult to manage. They also explained that in the fishing year (2019/2020) the TAC is extremely small so there might be additional difficulties in maintaining the species within TAC.<br><br>In their 2019 Advice, MFRI advised that when the precautionary approach is applied, catches in the fishing year 2019/2020 should be no more than 375 tonnes. As shown below, biomass and juvenile indices are at their lowest levels in the time series. Fproxy has been high since 2000.</td></tr>
</table>

[2] https://www.hafogvatn.is/static/extras/images/13-SpottedWolffish%20(1)1141515.pdf
[3] http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/




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

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

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

**Common loon Rationale:**

The common loon or great northern diver (*Gavia immer*) is listed under Appendix II of the Convention on Migratory Species and under the African Eurasian Waterbird Agreement. It is listed in Article I under the EU Birds Directive. In Europe, it occurs in 20 Important Bird and Biodiversity Areas (IBAs), including in Iceland, Norway (Svalbard and mainland Norway), Ireland, the United Kingdom and in Spain. It is a listed species in 83 Special Protection Areas in the EU Natura 2000 network. Last assessed in 2018, this species is categorised as Least Concern in the IUCN Red List with a stable population trend. Wetlands International (2016) estimated the population at 612,000-640,000 individuals. In Europe the breeding population is estimated at 700-1,300 pairs, which equates to 1,400-2,600 mature individuals (BirdLife International 2015).[450]

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

Icelandic Red list 2018 Classification[451]: Vulnerable (VU, D1), downlisted from EN in 2000.

[4] https://www.iucnredlist.org/species/18263655/44739959
[450] https://www.iucnredlist.org/species/22697842/132607418#conservation-actions
[451] https://en.ni.is/node/27141

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

**Table 32.** Icelandic cod fishery (gillnet, longline, otter trawl) annual seabird estimated bycatch from 2014-2016, including estimates of annual removal. Source: MFRI.

| Species | Cod gillnets | Longline | Otter trawl | Iceland Institute of Natural History (INH) Red List Classification | Population estimated in INH's 2018 Red List | Annual bycatch % removal of estimated population* |
|---|---|---|---|---|---|---|
| Northern fulmar (*Fulmarus glacialis*) | 1702 (1362-2042) | 920 (340-1500) | 0 | Endangered | 1.2 million pairs | 0.11% |
| Common guillemot (*Uria aalge*) | 454 (340-568) | 0 | 0 | Vulnerable | 693,000 pairs | 0.03% |
| Northern gannet (*Morus bassanus*) | 128 (69-187) | 0 | 45 (2-90) | Vulnerable | 37,000 pairs | 0.23% |
| Atlantic puffin (*Fratercula arctica)* | 13 (1-26) | 0 | 0 | Critically Endangered | 2 million pairs | 0.00% |
| Razorbill (*Alca torda*) | 26 (2-52) | 0 | 0 | Near threatened | 313,000 pairs | 0.00% |
| Common loon (*Gavia immer*) | 82 (3-164) | 0 | 0 | Vulnerable | 200–300 pairs | 16.40% |
| Common eider (*Somateria mollissima*) | 142 (2-282) | 0 | 0 | Vulnerable | 850,000 birds | 0.02% |
| Cormorants (*Phalacrocorax carbo*) | 0 | 47 (16-78) | 0 | Least Concern | 4,581 pairs | 0.51% |
| Great-black backed gull (*Larus marinus*) | 0 | 67 (2-134) | 0 | Endangered | 6,000–8,000 pairs | 0.48% |

***Note, the potential decline trajectory of these populations resulting from their INH Red List classification has not been taken into account in the annual percentage removal calculation.**

The MFRI provided further clarification on common loon bycatch where they highlighted that the estimate has a large variance based on an actual catch of 3 birds over several years. The birds are only vulnerable to bycatch for part of the year before they move to freshwater for nesting, hence the potential for an overestimate. They also noted that these 3 birds were all caught in the same year, and that is only 3 birds caught since 2010 when proper reporting started in the MFRI survey. They continued with saying that the estimate would be much lower if they include data from 2017-2019, but that analysis has not been finalized yet (Guðjón Már Sigurðsson, MFRI, pers. comm, 17th September 2019).

In view of the lack of reliable data to establish more precise bycatch estimates across the fishery (due to logbook underreporting of seabird and marine mammal bycatch and limited Directorate's Inspectors

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| | coverage on fishing vessels), the Team treats the estimates provided by the MFRI in September 2019 as best available information, in the absence of better-quality data to counter it. Considering the above, the Assessment Team determines that the cod fishery is likely having an impact on the Icelandic *Gavia immer* population, partly due to the small population size of this species. |
| **Corrective Action Plan** | In accordance with rules of the IRF Programme, the Client is required to submit a Corrective Action Plan (CAP) within 28 days.<br><br>**Corrective Action Plan (CAP) submitted by the client in November 2019**<br><br>Action to improve management of the spotted wolffish was taken by setting a TAC and allotting individual quotas to vessels beginning in the fishing year 2018-2019. Normally, such change in management approach is expected to lead to adjustment and changes in vessel behaviour, thus in turn leading to catch avoidance and consequent catch reduction. This process may take some time to stabilise and for that reason it is too early to tell to what extent this change serves to remedy the situation. Nevertheless, the TAC for 2019-2020 is only 37.5% of the previous year's TAC and thus the situations deserves more focused study. It is thus positive to seek other management tools and measures that may further aid in this endeavour. Accordingly, the MFRI has set up a monitoring plan (below). Among other things, this plan sets the goal of further charting the situation in order to identify more closely areas for potential closure during spawning time and beyond. It would thus be appropriate to collate the results and initiate further planning in connection with the next surveillance assessment. |

  

To whom it may concern

MARINE & FRESHWATER RESEARCH INSTITUTE

Reykjavík, 20.11.2019
21.09.01 /HLÝ
GÞ/mþ

**Monitoring plan for spotted wolffish *(Anarhichas minor)***

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

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

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

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

Gudmundur Thordarson

Head of Demersal Division

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

  

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| | the estimate would be much lower if they include data from 2017-2019, but that analysis has not been finalized yet (Guðjón Már Sigurðsson, MFRI, pers. comm, 17th September 2019).“<br><br>Hence, at this point, it is difficult to see what specific management action could be taken at this time. The Client awaits the outcome of the analysis discussed by the MFRI (above) in 2020 and notes that there is ongoing action to improve the recording of bycatch in the fishery. Furthermore, the client plans to monitor whether there are instances of common loon bycatch, in order to assess and evaluate and reconsider accordingly, in cooperation with the relevant expert at the MFRI. |
| **Assessment Team CAP response** | The Assessment Team has accepted the CAP submitted by the Client Group in collaboration with the MFRI. The CAP is thus considered adequate to address the spotted wolfish and common loon issue. Monitoring of such CAP and related measures will occur in upcoming surveillance audits. Accordingly, the Assessment Team will be requesting the Client group for updated information about this issue at the 1st Surveillance audit in late 2020/early 2021 and will try to establish a more specific set of milestones for future surveillances at that time, to better define the timelines for closure of this minor non-conformance. |

The Assessment Team has also issued a number of formal Recommendations for the Client Group to consider.

**Recommendation #1 (relating to clause 1.5.8).** The Assessment Team recommends that the issue of TAC overshooting (due to flexibility measures in Iceland) is addressed at the next management plan revision in 2020/2021 and that the harvest control rule is evaluated through simulation by addressing the implementation bias in the order of magnitude experienced in recent years.

**Recommendation #2 (relating to clause 3.1.1).** The Assessment Team recommends that Grey skate (Dipturus spp.), a Critically Endangered Species listed in the IUCN Red list, are afforded more explicit/directed management measures to ensure that the current bycatch levels resulting from longline, bottom trawl and Danish seine fisheries in Icelandic waters do not negatively affect the recovery of this species.

**Recommendation #3 (relating to clause 3.1.1 and 3.1.2).** Several fisheries management plans (e.g. those for cod, haddock, saithe and redfish) state that it is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs). VMEs of particular importance within Iceland include cold water coral communities and hydrothermal vent areas, but also deep-sea sponge aggregations (a threatened and declining habitat, according to OSPAR[452]) and sea-pen fields[453]. 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.

**Recommendation #4 (relating to clause 3.2.2.3)**
The assessment team recommends that the population and status of harbour porpoise (*Phocoena phocoena)* in Iceland is appropriately monitored and quantified due to conflicting abundance estimates (e.g. resulting from absolute and relative survey abundance indexes[454] and recent modelling efforts[455]) due to the potential risk of significant depletion to its population, specifically in regard to performance against proposed thresholds

[452] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/Ecosystem_overview-Icelandic_Waters_ecoregion.pdf
[453] https://novasarc.hafogvatn.is/project/
[454] https://nammco.no/wp-content/uploads/2019/11/final-report_aewg-20192.pdf
[455] https://www.ascobans.org/sites/default/files/document/ascobans_ac25_inf.4.3a_joint-imr-nammco-ws-harbour-porpoise.pdf

  

(e.g. ASCOBANS annual replacement potential of 1.7% for harbour porpoises[456], or 2018 PBR limit of 3500 porpoises[5]).

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

[456] http://www.ascobans.org/en/document/ospar-background-document-harbour-porpoise-phocoena-phocoena

  

# 13. Recommendation and Determination

**The assessment team determines that the management system of the applicant fishery, the Icelandic cod (*Gadus morhua*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by demersal trawl, long-line, gill net, Danish seine net, (and hook and line by small vessel gear) and indirectly by Nephrops trawls, shrimp trawls, pelagic trawls and purse seines within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), be granted re-certification to the Icelandic Responsible Fisheries Certification Programme.**

  

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# 15. Appendix 1. Assessment Team Bios

Based on the technical expertise required to carry out the above fishery assessment, SAI Global is pleased to confirm the Assessment team members for the fishery as follows.

**Vito Romito (Lead Assessor)**
Vito has almost 10 years of expertise in fisheries certification. He's 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 fisheries assessments in the Baltic Sea, Canada, Iceland, Alaska and Louisiana.

**Conor Donnelly**
Conor is an experienced marine ecologist and environmental manager with a background of over 17 years at the UK statutory nature conservation body, Natural England, where he was Senior Marine Adviser responsible for marine delivery across the East Midlands, Norfolk and Suffolk. He has a BSc. in Environmental Science from King's College, University of London and an M.Res. in Marine and Coastal Ecology and Environmental Management from the University of York. Conor is also an MSC approved Fisheries Team Leader. Conor has extensive experience of working with fisheries managers, the fishing sector, local communities and eNGOs, particularly from assessing the environmental impacts of mussel, cockle and shrimp fisheries in The Wash, UK and providing advice on their management. He was Natural England's representative on the Eastern Inshore Fisheries and Conservation Authority and its predecessor. He also advised and supported the UK's Department for Environment, Food and Rural Affairs (Defra) on fisheries casework in the southern North Sea under the Common Fisheries Policy (CFP) including meetings with other member states. Other experience includes Marine Protected Area designation, conservation advice and condition assessment; conservation legislation and policy; and working with partners and stakeholders to deliver positive environmental outcomes. Conor is certified as a Fisheries Team Leader under MSC FCR versions 1.3 and 2 and a fisheries assessor under the IFFO RS Standard.

**Dankert Skagen, (Assessor)**
Dankert has recently retired from the Institute of Marine Research (IMR), Bergen, where he worked for 22 years. His responsibilities included stock assessment, multispecies work, in particular in the North Sea, work connected to the introduction of the precautionary approach in fisheries and recently, on development of harvest control rules and management strategies. He was leader of the IMR research program for population dynamics and multispecies investigations in 1996-97 and for the development of new assessment tools for North-East arctic cod in 1998-99 and the assessment package TASACS in 2007-08. In addition, he has developed several programs for simulating harvest control rules that are commonly used in fisheries management today. Within ICES, he has participated in a wide range of working groups and been chairman of

  

several of them, including the Study Group of Management Strategies. He was chairman of the Resource Management Committee for 3 years and member of ACFM for 7 years.

**Gisli Svan Eirnasson, (Assessor)**

Gísli Svan Einarsson has in depth knowledge of the management system and operational management of Icelandic ground fish fisheries during his previous employment as a Fleet Manager of FISK Seafood for 18 years. Specialist assessor skills stem from his knowledge of quota setting, allocation and monitoring and compliance. Local knowledge of fishery management concerns, current knowledge, fleets, organizations, fleet structure and supply chains. Gísli Svan has been a Project Manager of many Projects concerning the Fishing Industry and a specialist in fish traceability. Gisli is currently employed as Manager by VERID Science Park, Iceland. Qualifications include a BA from the University of Bifröst and Diploma in Administration in Fishing Industry from “Tækniskóli Íslands” now the University of Reykjavík.

  

# 16. Appendix 2. Peer Review Team Bios

**Dr. Lisa Borges**

Lisa Borges earned her PhD in Zoology from the National University of Ireland – University College Cork. Since 2010 she works as a Consultant for FishFix (Brussels) where she focuses on the biological and ecological sustainability of specific fisheries and aquacultures by providing expertise in the areas of bycatch and discards. She has experience in auditing fisheries for sustainability, coordinating the involvement of various stakeholders, providing technical advice on data collection, drafting and generating policy, and contract development in fisheries management. She worked as Fisheries Scientist for Wageningen IMARES and as Policy Officer for the European Commission DG MARE. In addition, Lisa has a multitude of publications on discard policy and procedures and has been the Chair/Co-Chair in several international conferences, workshops and working groups.

**Dr. Geir Hønneland**

Dr. Geir Hønneland is Director at the Fridtjof Nansen Institute in Oslo, Norway, and adjunct professor at the University of Tromsø, Norway. He holds a PhD in political science from the University of Oslo and has studied international fisheries management (with main emphasis on compliance issues), international environmental politics and international Arctic politics. Among his recent books are Arctic Politics, the Law of the Sea and Russian Identity(Palgrave, 2014), Making Fishery Agreements Work (Edward Elgar, 2012), International Environmental Agreements (Routledge, 2011), Arctic Politics and International Cooperation (Routledge, 2007) and Law and Politics in Ocean Governance: the UN Fish Stocks Agreement and Regional Fisheries Management Regimes (Martinus Nijhoff,2006). He worked in the Norwegian Coast Guard from 1988 to 1994, where he was certified as a fisheries inspector. Geir also has a wide range of evaluation and consultancy experience, e.g. for the FAO and OECD, relating to responsible fisheries management. He has been involved in MSC assessments since 2009 (covering cod, blue whiting, haddock, herring, mackerel and shrimp fisheries in the Northeast Atlantic and krill in the Southern Ocean) and was certified as MSC Team Leader in 2014. Geir has also been involved in IRFM demersal/pelagic fisheries assessments since 2019.

**Deirdre Hoare**

Deirdre Hoare is an independent fisheries consultant with more than 10 years of experience working in a wide range of projects associated with marine biodiversity and the sustainable use of living aquatic resources. Her principal area of expertise is in relation to stock assessment and ecosystem impacts of both artisanal and commercial fisheries. Her work currently involves evaluation and verification of fisheries management and sustainability against international standards. She also performs fish stock assessments, evaluates data and outlines the limitations. From 2005 to 2010 she worked as a Fisheries Assessment Analyst and as a Scientific and Technical Officer for the Marine Institute in Ireland. This work involved fisheries research and stock assessment for ICES working groups. The work also involved coordination and management of a Fisher Self sampling program in the Irish Sea, with particular emphasis on spatial and temporal discard measurement tools. As well as having worked as a researcher, she completed many trips on commercial fishing vessels in the capacity of scientific observer in the NAFO area, North West Atlantic and Irish Coast. She has also experience on finfish and shellfish aquaculture that she gained working in Scotland. She has been involved with FAO Responsible Fisheries Management and Marine Stewardship Council assessments in both Iceland, Alaska and Ireland.

  