ICELAND RESPONSIBLE FISHERIES MANAGEMENT (IRF) CERTIFICATION PROGRAMME

Full Assessment Report and Determination

For The

Icelandic Ling Commercial Fisheries

Facilitated By

Iceland Responsible Fisheries Foundation (IRFF)

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ICELAND RESPONSIBLE FISHERIES
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Glossary

AIS	Automatic Identification System
$B_{75\ cm+}$	Biomass of fish of ≥75 cm in length
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 designed 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
IMA	Icelandic Maritime Administration
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 $B_{trigger}$	Parameter in the ICES MSY framework which 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	ICES North-Western Working Group
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.

Table of Contents

List of Figures

List of Tables

i. Summary and Recommendations

The Iceland Responsible Fisheries Foundation (IRFF) on behalf of Fisheries Iceland and the National Association of Small Boat Owners, Iceland (NASBO) requested that the conformity of Icelandic commercial fisheries targeting common ling (*Molva molva*) to the FAO-based Icelandic Responsible Fisheries Management (IRFM) Certification Programme be assessed.

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

The Certification Programme is accredited to the international standard ISO/IEC 17065, confirming that consistent, competent and independent certification practices are applied. Formal ISO/IEC 17065 accreditation by an IAF (International Accreditation Forum) Accreditation body gives the Programme formal recognition (since September 2014), credibility in the International marketplace and ensures that products certified under the Programme are identified at a recognised level of assurance.

The unit of assessment in this report, which represents the proposed unit of certification, is comprised of all Icelandic vessels using a variety of legal fishing gears to fish for common ling within the Icelandic EEZ and managed by the Icelandic Ministry of Industries and Innovation. The proposed unit of certification was deemed appropriate and practical for the purpose of full assessment.

Based on the evidence reviewed the Assessment Team during this Assessment, the majority of areas score highly against the IRFF Standard v2.0. However, one area (essentially related to potential non-compliance with reporting requirements for non-commercial bycatch species) scored less than full conformance to the IRFF Standard v2.0.

The key outcomes of this Assessment have been summarized in the Summary of Assessment Outcomes.

ii. Schedule of Key Assessment Activities

Month and Year	Assessment Activity
18th January 2018	Assessment Announced
18th January 2018	Notice of Assessment Team
13th – 15th February 2018	On-site meetings
August 2018	Provisional scoring by Assessment Team
24th August 2018	Requests for Clarification Issued
20th December 2018	Non-conformance #1 issued
14th January 2019	Request for extension to deadline for providing Corrective Action Plan (CAP)
25th January 2019	Request for further extension to deadline for providing CAP
15th February 2019	Corrective Action Plan submitted
April 2019	Report sent for Peer Review
20th and 22nd August 2019	Certification Committee and Determination
23rd August 2019	Final Assessment Report and Determination

iii. Assessment Team Details

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1. Introduction

This assessment of Icelandic common ling (*Molva molva*) fulfils part of the procedure for the certification of the fishery to the Iceland Responsible Fisheries Foundation (IRFF) Responsible Fisheries Management (RFM) Certification Programme (hereafter IRFM Programme). The IRFM Programme is a voluntary program for Icelandic fisheries initially established by the Fisheries Association of Iceland (FAI) and now owned and administered by the 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 assessment utilizes the FAO-based Icelandic Responsible Fisheries Management (IRFM) Certification Programme Standard Revision 2.0 (July, 2016) which in turn is based on the 1995 FAO Code of Conduct for Responsible Fisheries (CCRF) and FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries adopted in 2005 and amended/extended in 2009. The assessment process constitutes an assessment of the applicant fisheries' management systems against the FAO-based IRFM conformance criteria outlined in IRFM Standard Revision 2.0 (July, 2016).

Available evidence has been analysed with respect to each and every scoring element of the IRFM Standard and whether or not the fishery meets applicable requirements outlined in Revision 2.0 of the IRFM Standard.

The Assessment is based on the 3 major Sections of responsible fisheries management:

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

1.1. Recommendations of the Assessment Team

The assessment team recommends that the management system of the applicant fisheries, Icelandic common ling (*Molva molva*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished with longlines, demersal otter trawls (also known as bottom trawls), gillnets, Nephrops trawls, Danish seine nets, hook-and-line by small vessels and gears from other Icelandic fisheries also legally landing common ling within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), be granted certification.

2. Fishery Applicant Details

Table 1. Fishery applicant details.

Applicant Contact Information	
Organisation/Company Name:	Fisheries Iceland
Date:	8 February 2010
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:	8th February 2010
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

3. Background to the Fishery

3.1. Target Species – Common ling (Molva molva) (Icelandic: Langa)

The common ling (*Molva molva*) (Icelandic: Langa), hereafter ling, is the largest fish of the cod family, growing up to 200 cm in length and 30 kg in weight. A second ling species, blue ling (*Molva dypterygia*) (Icelandic: Blálanga), is also fished commercially in Icelandic waters; this species will be referred to as blue ling throughout this report

Ling have a comparatively small head and eyes and an upper jaw that projects beyond a lower jaw that bears a distinct sensory barbel (Figure 1). Unlike most other cod species, *Ling* have two instead of three dorsal fins, a short first dorsal fin with 14- – 15 fin rays and a considerably longer second dorsal fin with 61 – 68 fin rays. The anal fin is also elongate with 58 – 64 fin rays. The caudal peduncle and pelvic fins are short with the latter not extending beyond the pectoral fins. In terms of colouration Ling are countershaded, being a dark marbled greenish-brown on the upper side and becoming lighter on its flanks and underside. The anal and dorsal fins have a distinct white edge and bear a dark spot at the rear which is particularly conspicuous on the first dorsal fin. Juveniles tend to be generally lighter in colour.

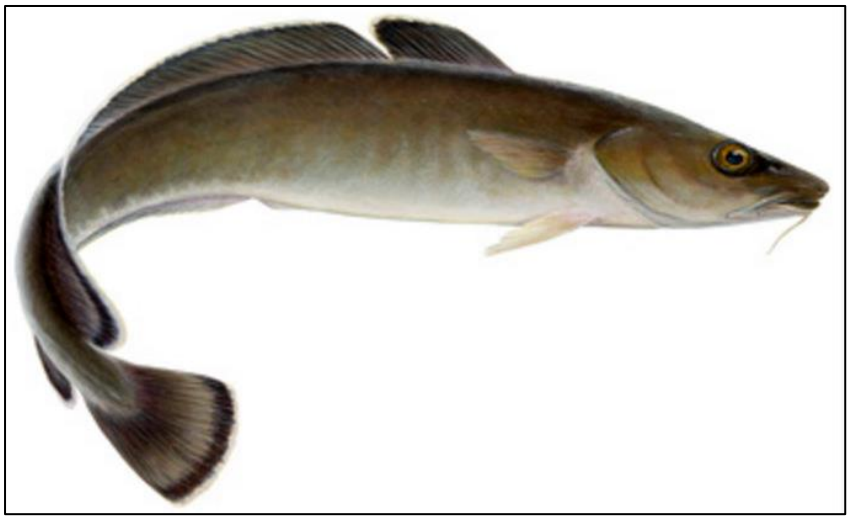

Figure 1. Common ling (*Molva molva*) (Source: http://www.fisheries.is).

Icelandic ling spawn offshore along the continental shelf break off south and west Iceland in May and June with each female producing up to 60 million pelagic eggs. During development eggs remain near the water's surface before hatching after approx. 10 days. Juvenile ling stay in coastal waters for the first 2 – 3 years. Growth is initially rapid with annual growth of between 8 and 10 cm until the ninth year but this slows as the fish ages. Females, reaching maturity at 90 – 100 cm or 6 – 8 years of age and living up to 14 years, are faster growing and longer lived than males which reach maturity at ca. 80 cm and rarely live for more than 10 years. The maximum reported age for a ling is 25 years.

Ling are a demersal fish, found over a wide range of depths from 15 m to 1,000 m; however, they occur most frequently at depths of between 100 m and 400 m, with younger fish generally being found in shallower waters. Ling have a large mouth with sharp teeth and feed on other fish such herring, flatfishes, and other codfishes; invertebrates such as crustaceans and starfish may also be consumed, but more likely by the inshore juveniles. Ling are widely distributed in European waters of the Northeast Atlantic and can be found from Norway to the Mediterranean Sea. Ling are also found off southern Greenland and in the Northwest Atlantic off Canada. (Figure 2). Ling appears to be sufficiently isolated on separate fishing grounds and can be considered as individual assessment units.

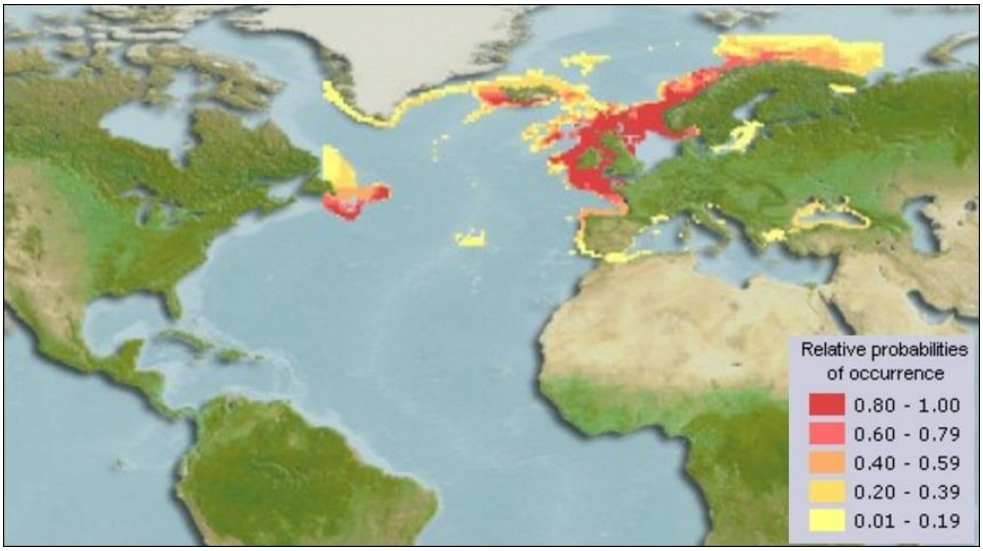

Figure 2. Common ling (*Molva molva*) range (Source: FishBase).

3.2. Fishery Location

The stock structure for ling is poorly known, and there is no firm evidence to identify separate stocks in the North Atlantic. The pragmatic attitude, shared by ICES, is that when there are wide gaps between areas, their stocks may be assumed to be sufficiently isolated to be managed separately. Accordingly, ling in Icelandic waters (ICES Division 5a) is managed as a separate stock.

For demersal fisheries the scope of the IRFF Standard is limited to Icelandic vessels fishing in Icelandic waters, as such only those areas within the boundaries of the Icelandic EEZ (i.e. the area in green in Figure 3) are covered in detail in this assessment and ultimately only catches from this area would be eligible for Certification.

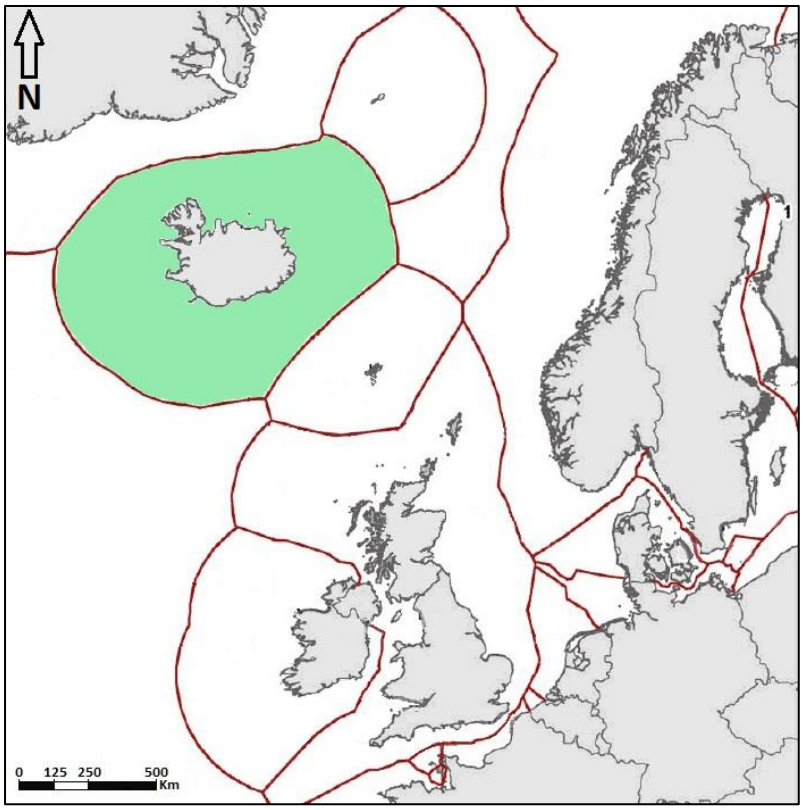

Figure 3. Icelandic EEZ from which catches would ultimately be eligible for Certification.

Directed fishing for ling occurs mainly off south and west coasts of Iceland, with the most important fishing grounds being close to the Westman Islands (Vestmannaeyjar) (Figure 4).

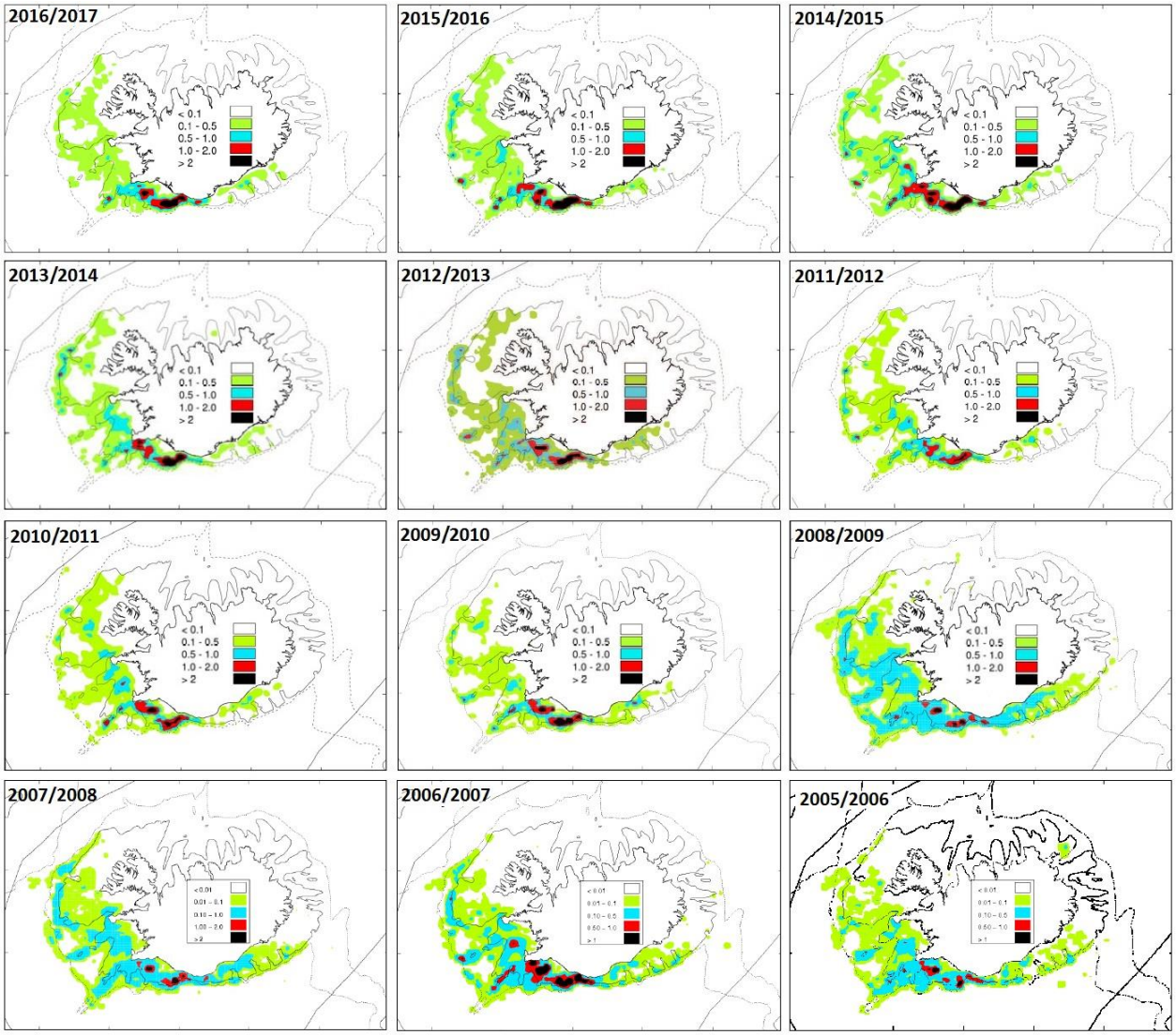

Figure 4. Spatial distribution of ling catches (t/nmi^2) (2005/2006 to 2016/2017). Dark areas indicate highest catch. (Source: MRI reports).

3.3. Fishing Gears used in the Fishery

The directed fishery for ling is prosecuted mainly with longlines, bottom trawls and gillnets by Icelandic vessels. Ling are also landed as a by-product of directed trawl fishing for *Nephrops norvegicus* to the south and west of Iceland and more generally as a component of mixed fisheries around Iceland, including landings by Norwegian and Faroese vessels. According to ICES (WGDEEP 2016), catches were reported by 159 longliners, 58 trawlers and 44 gillnetters in 2015.

The relative contribution to total landings by each fishing gear has changed substantially in recent years. Longline landings have increased from ca. 11% from 1982 – 1989 to 65% in 2015 (Figure 5). In contrast, the % of landings from gillnets has decreased substantially in line with a more general decline in the use of gillnets in Icelandic fisheries from 24% from 2000 – 2002 to 7.5% in the 2015/2016 fishing season. Bottom trawls accounted for 18.2% of ling landings in 2015/2016 with Nephrops trawls and Danish seines contributing 6.3% and 2.4% respectively; handlines and monkfish nets combined to contributed the remain 0.2%. Longline catches of ling generally take place at depths of less than 300m while trawl catches occur in waters less than 500 m deep.

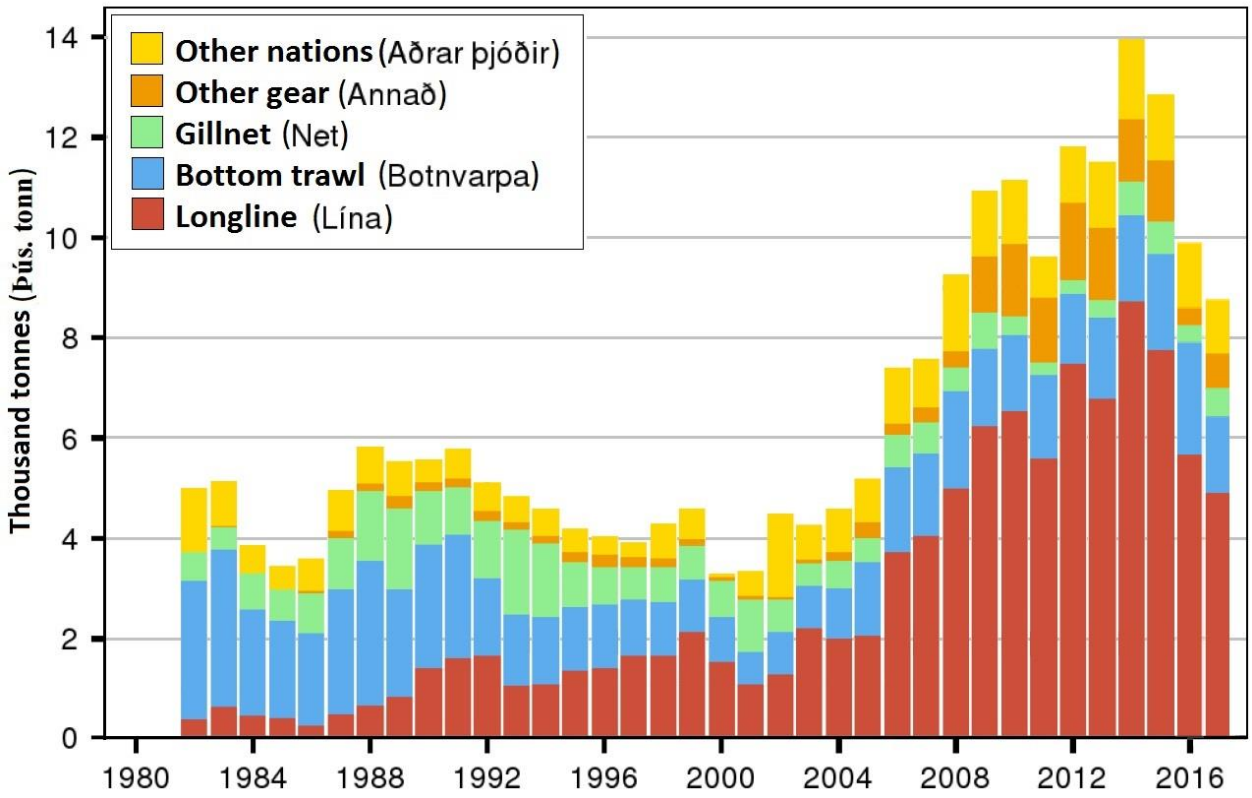

Figure 5. Landings by gear type since 1982 – 2017 (Source: MRI).

3.3.1. Longline

In longline fishing, vessels known as longliners, use longlines to catch primarily demersal species of fish. A longline is made up of a mainline ("groundline"), with anchors on both ends from which lines run to the surface where they are marked with a buoy and flag (Figure 6). The groundline is made up of multiple strings connected end to end each consisting of a main line with attached branch lines and baited hooks. The overall length of the longline varies depending on the number of strings making up the groundline but lines may be up to 20 km long and have 16,000 hooks.

A longline vessel may fishes several lines simultaneously. In Icelandic longline fisheries lines are usually left on the bottom for one to four hours. The bait is most often herring, mackerel, capelin or squid pieces and lately artificial bait.

Longlines have a number of benefits in that they can be used on rough ground where other types of fishing gear cannot be operated. In addition, fish are usually alive when the line is hauled meaning longline caught fish often have a reputation for freshness. Longline fisheries have become increasingly mechanised in recent year with baiting and other parts of the longlining process commonly carried out automatically at sea. In some species quota uplifts are awarded to vessels fishing with longlines ("longline discount") and where lines are baited onshore using traditional methods.

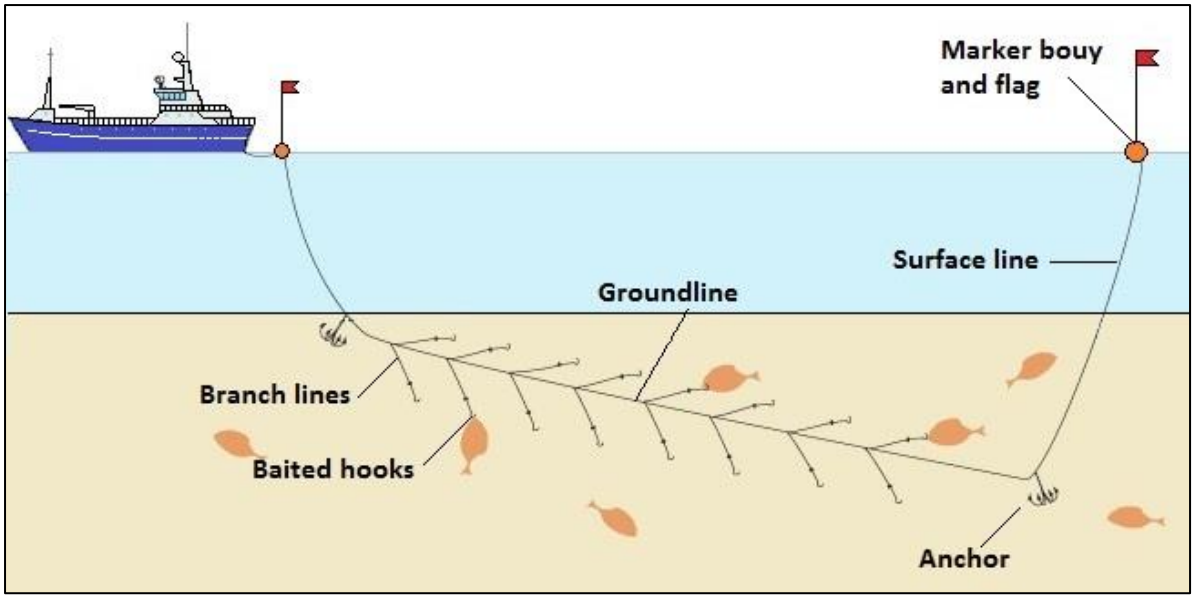

Figure 6. Schematic of a benthic longline.

3.3.2. Bottom trawl/Demersal trawl

Bottom trawls are funnel shaped bags of nets that are towed long the ocean floor to catch demersal species. If the trawl uses specialised pieces of equipment called otter boards to spread the opening of the trawl horizontally then these trawls are known as otter trawls. Otter trawls use the hydrodynamic forces generated by otter boards to spread the net opening horizontally while vertical spread is achieved with the use of floats attached to the upper edge of the net mouth (headrope) to provide vertical lift and weights distributed along the lower edge (footrope/groundrope) to hold it down (Figure 7). Depending on the bottom conditions where the gear is to be fished, the footrope may also be fitted with rubber discs (known as bobbins or rockhoppers) to help prevent the net from snagging on the bottom. Bottom trawls may be further categorised by species they have been adapted to catch such groundfish trawls, shrimp trawls or Nephrops trawls. Throughout this report bottom trawl will refer to demersal otter trawls.

Bottom trawls are the most important gear in use in Icelandic fisheries and have been variously adapted to fish different target species. Around Iceland bottom trawls are used at depths of between 80 and 1500 m. Bottom trawls are primarily used to target cod, demersal redfish, haddock, saithe and Greenland halibut but also catch large amounts of plaice, Atlantic catfish, spotted catfish, ling, blue ling, tusk, great silver smelt and lemon sole. In Icelandic groundfish fisheries, there is a minimum mesh size of 135 mm and selectivity devices are also required when fishing in certain areas.

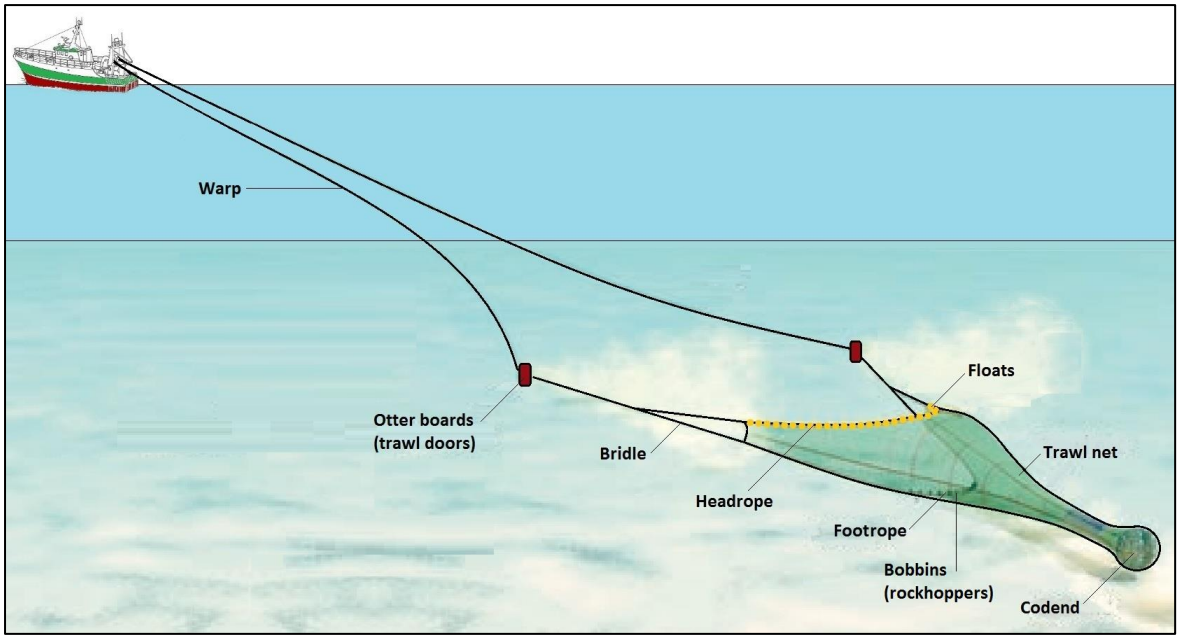

Figure 7. Schematic of a demersal otter trawl.

3.3.3. Gillnet

Gillnets are long walls of netting, anchored on both ends and kept vertical in the water column by floats on top and lead-weight on the bottoms (Figure 8). Fishing is based on the fish swimming into the net since they are not able to see it and getting entangled by the gills (a process known as gilling). Gillnets are similar to entangling nets except for the fact that net is much more tightly hung to ensure fish are gilled and in this way they are much more size selective. Netting is mostly woven from fine nylon twine, which is practically invisible underwater under most conditions.

Demersal gillnets generally measure between 1.5 m and 6 m from the top to the bottom of the net and each net is generally around 50 m long; multiple gillnets (often around 10) are then strung together to form each set. A vessel will usually fish multiple gillnet sets simultaneously with each set being fished for no more than 24 hours to ensure the quality of the catch does not suffer. Gillnets are mainly used by small to intermediate sized boats, similar in size to longliners.

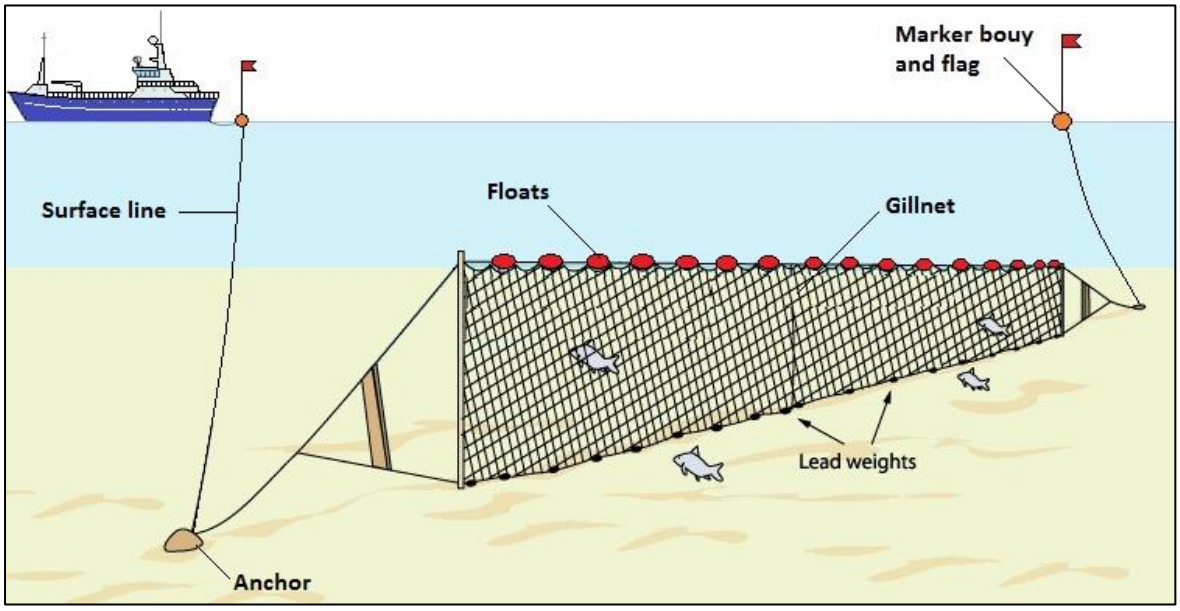

Figure 8. Schematic of a demersal gillnet.

3.3.4. Nephrops trawl

A Nephrops trawl is a type of demersal otter trawl specifically adapted to catch *Nephrops norvegicus*. Nephrops trawls differ very little from groundfish trawls (see Figure 7) apart from their being generally more lightly rigged and subject to a smaller regulation minimum mesh size. In Icelandic Nephrops fisheries there is a minimum mesh size of 135 mm in the square (the fore part of the upper panel of the trawl after the wings) and 80 mm in all other sections of the trawl. Nephrops trawls also differ from groundfish trawls in that the groundrope is generally not fitted with bobbins. While this means that Nephrops trawls cannot be used over rough ground this is not so much of an issue as Nephrops are primarily found in areas with muddy substrates. Another important benefit of not fitting bobbins is that the trawl fishes closer to the bottom which increases the catchability of lobster.

In Icelandic fisheries sorting grids are not required in Nephrops trawls and as a consequence they may catch significant amounts of demersal fish species as non-target bycatch.

3.3.5. Danish seine (Demersal seine)

Danish seines has resemble demersal trawls in appearance with wings, a net belly, and a codend (Figure 9); however, a Danish seine does not use otter boards and they are operated quite differently. Danish seining (also sometimes called Scottish seining or fly-dragging) relies on long lengths of warp, as much as 3 km per side, which herd fish into the path of the net as the gear is hauled.

The first step of Danish seining is to set out the end of one of the warps (warp 1) on a marker buoy and to which the vessel returns to complete the set. The vessel then steams in either a circular, pear shaped, or triangular pattern while shooting the remainder of warp 1, followed by wing 1 of the seine, the net bag, wing 2 of the seine and finally warp 2 as the vessel heads back to the marker buoy to retrieve the end of warp 1. Once the marker buoy has been taken retrieved the vessel begins to haul the gear. As the gear is hauled, the warps are gradually pulled closer together, all the time herding any fish present towards the centre of the set. At the same time the seine moves over the bottom, capturing the fish herded into its path by the warps. Once the warps have come together, the gear is retrieved in a similar manner to a trawl culminating with the seine being taken aboard with a power block.

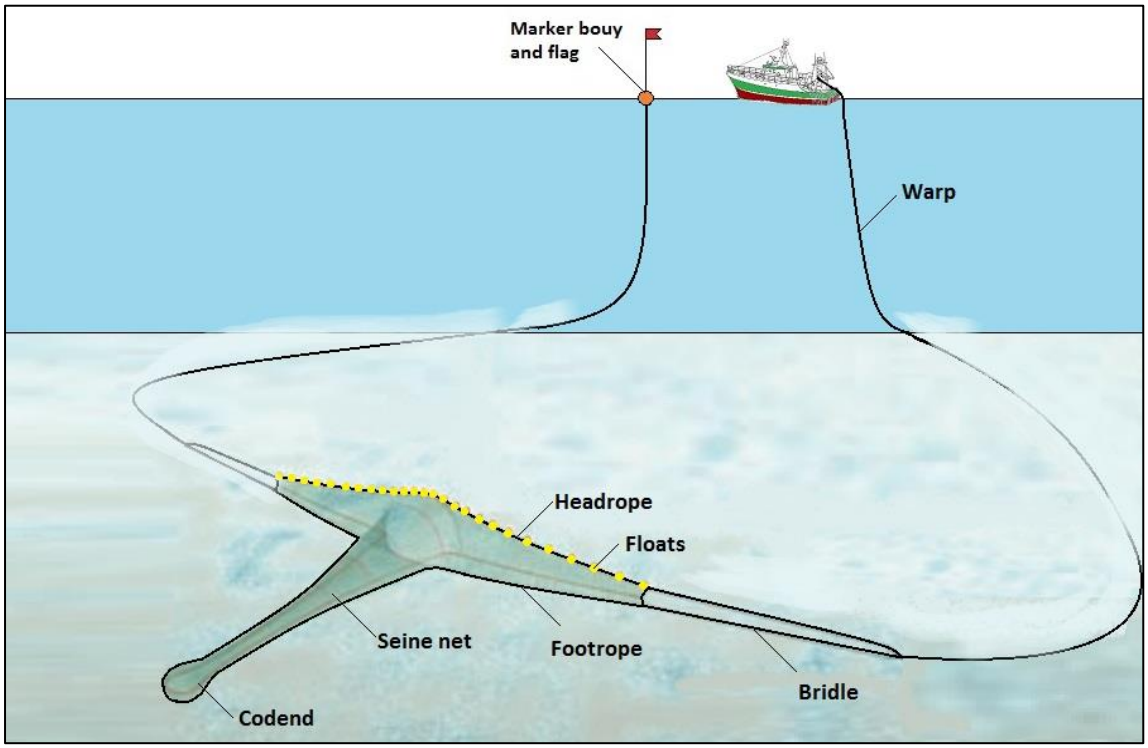

Figure 9. Schematic of a Danish seine.

3.4. Fisheries Management System

Ling in Icelandic waters are regarded as a separate stock and as such the stock is managed solely by the Icelandic authorities; however, scientific advices is also provided externally by ICES. Iceland has a well-established fisheries management, supported by legislation where appropriate. There are four major entities involved in the day to day management of Icelandic fisheries:

- The Ministry of Industries and Innovation is the principal management organization responsible for Icelandic fisheries
- The Directorate of Fisheries implements fishery regulations on a day to day on behalf of the Ministry
- The Icelandic Coast Guard monitors fishing within the Icelandic zone, while also performing search and rescue, operating the Icelandic Maritime Traffic Service and undertakes hydrographic surveys
- The Marine Research Institute (MRI) conducts a wide range of marine research and provides the Ministry with scientific advice.

At present, there is no formal management plan in place for Icelandic ling. Since the 2001/2002 fishing season, ling in Icelandic waters has been managed as part of the overall ITQ system. Presently, the overall TAC is set according to $F_{MSY.}$ Over the years, actual catches have deviated from the TAC – in both directions.

The Minister of Fisheries and Agriculture determines the Total Allowable Catch (TAC) of Icelandic ling for each fishing season considering scientific advice from the MRI. MRI advice is based both on work done in-house and through external collaboration with ICES. The main management measures in place in Icelandic fisheries include TACs in an ITQ system, a prohibition on discarding, spatial and temporal closures and technical regulations such as minimum mesh sizes.

Icelandic TACs for ling apply from 1st September to 31st August the following year. As previously discussed, the overall TAC is apportioned according to a system of Individual Transferable Quotas (ITQs) which has been in place since the 2001/2002 fishing season. The ITQ system includes a variety of flexibility provisions designed to facilitate the matching of catch composition and quota portfolios and to reduce incentives for discarding of catch. Current quota share and allocations are publically available on the Directorates website. The system is very transparent, rules are enforced by the Directorate and the MRI and there are penalties for serious infractions.

3.5. Historical Background to the Fishery

While not one of the main groundfish species in terms of landings or commercial value, ling has long been a species of commercial interest in Iceland. Ling in Icelandic waters are primarily fished by Icelandic vessels, although Norwegian and Faroese vessels also fish some ling in mixed fisheries around Iceland (Figure 10). As previously discussed, ling are mainly fished with longlines, bottom trawls and gillnets off south and west of Iceland. In recent years ling have moved to the west and north of Iceland as sea temperatures have increased and ling are now caught in multispecies fisheries around the country rather than only off the south coast as was the case historically.

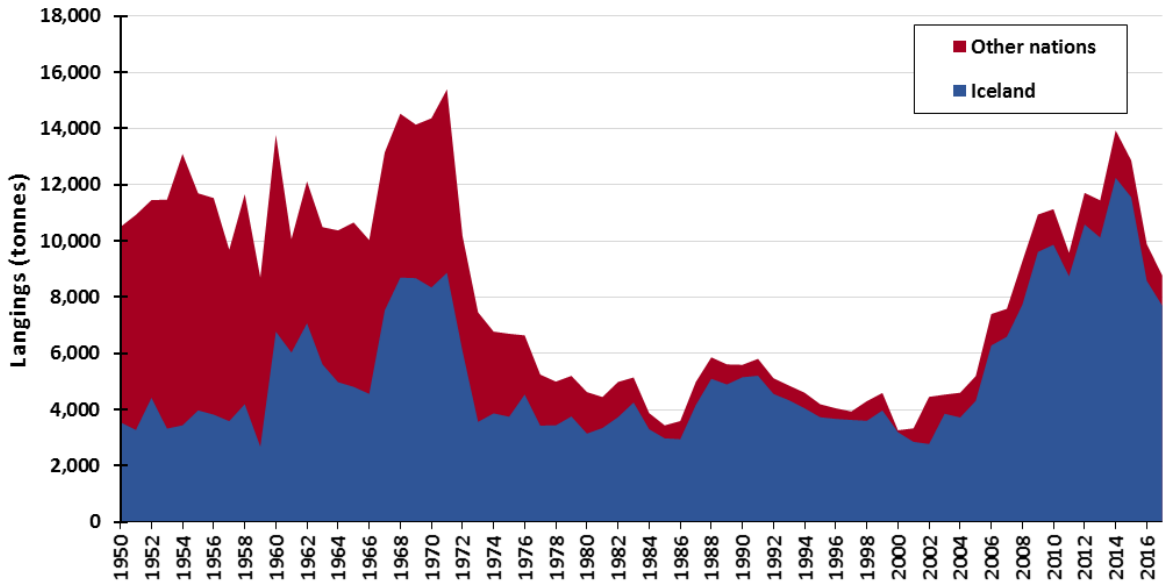

Figure 10. History of ling catches from Icelandic fishing grounds (ICES division 5a) (1950 to 2017) as estimated by ICES (Source: ICES, 2016).

3.6. Stock Assessment Methods and Practices

Ling in Iceland is regarded as a local stock. A comprehensive survey of available data in 2007 led ICES to conclude that ling in Icelandic waters is separate from ling further to the South and in the Norwegian and Barents seas. A more recent comprehensive genetic study of ling stock structure had a similar conclusion.

The state of the stock is assessed by the ICES WGDEEP annually. Based on that, ICES provides advice that is used by MFRI to advice Icelandic authorities. The data that go into the assessment is catch numbers at length (and to some extent at age), and a survey in the spring which is one of the major Icelandic bottom trawl surveys.

Icelandic ling catch in tonnes by month, area and gear are obtained from Statistical Iceland and Directorate of Fisheries. Catches are only landed in authorized ports where all catches are weighed and recorded. Logbook statistics are available since 1991. They are not used directly for assessment, but provide information on i.a. the distribution of catches. Landings by Norwegian and Faroese vessels are provided by the Icelandic Coast Guard and reported to the Directorate of Fisheries.

Discard is banned in the Icelandic fishery. Based on limited data, discard rates in the Icelandic longline fishery for ling have been estimated to be very low (<1% in either numbers or weight). Measures in the management system such as converting quota share from one species to another are used by the fleet to a large extent and this is thought to discourage discards in mixed fisheries.

Biological data from the commercial longline and trawl catch are collected from landings by scientists and technicians of the MFRI). The biological data collected are length (to the nearest cm), sex and maturity stage (if possible, since most ling is landed gutted), and otoliths for age reading. Most of the fish from which otoliths were collected were also weighed (to the nearest gramme). Biological sampling is also collected directly on board on the commercial vessels during trips by personnel of the Directorate of Fisheries in Iceland or from landings (at harbour). These are only length samples. The sampling is done according to a detailed protocol. The sampling is regarded as satisfactory by MFRI (Confirmed at site visit, 13 Feb. 2018)

Substantial progress has been made on age reading and by now, aged otoliths are available from the 2000 onwards. Most of the ling caught in the Icelandic spring survey is between age 5 and 8 but from longlines the age is between 6 and 9.

Iceland has two major bottom trawl surveys, in the spring and in the autumn. Only the spring survey is used for ling, as the coverage is more relevant for this species. The trends in abundance in the two surveys is fairly similar.

The assessment is done with the Gadget tool[1], which is a forward projecting age-length based population model fitted to catch and survey data. The method fits modelled age-length distributions, length distributions, maturity data and survey indices by length class to corresponding observed values. The fit is optimized by minimizing a likelihood function which is a weighted sum of contributions from the data sources, listed in the Table 2 below. The method is used for several Icelandic species. The method was first applied to ling in 2014, and was amended and approved by ICES in a benchmark workshop in 2017, where also the present reference points and harvest rule were approved.

Table 2. Data sources used in the ling stock assessment.

Origin	Time-span	Length group size	Num. data-points	Likelihood function	Weight group
	Age–length distributions:				
Commercial catches	All quarters, 2001–2016	4 cm	946	See eq. 2.16	comm
Commercial catches	All quarters, 2001–2016	4 cm	449	See eq. 2.16	comm
March Survey	2nd, 2001–2016	4 cm	935	See eq. 2.16	aldist.igfs
Commercial catches	All quarters, 2001–2016	4 cm	1291	See eq. 2.16	aldist.lln
	Length distributions:				
Commercial catches	All quarters, 1982–2016	4 cm	1440	See eq. 2.15	comm
Commercial catches	All quarters, 1982–2016	4 cm	693	See eq. 2.15	comm
March Survey	2nd, 1985–2016	4 cm	928	See eq. 2.15	ldist.igfs
Commercial catches	All quarters, 1994–2016	4 cm	2129	See eq. 2.15	ldist.lln
	Ratio of immature:mature by length group:				
March Survey	2nd, 1990–2016	8 cm	680	See eq. 2.17	matp.igfs
	Survey indices:				
March Survey	1st, 1985–2016	20 – 52 cm	32	See eq. 2.14	sind1
March Survey	1st, 1985–2016	52 – 60 cm	32	See eq. 2.14	sind1
March Survey	1st, 1985–2016	60 – 72 cm	32	See eq. 2.14	sind1
March Survey	1st, 1985–2016	72 – 80 cm	32	See eq. 2.14	sind2
March Survey	1st, 1985–2016	80 – 92 cm	32	See eq. 2.14	sind2
March Survey	1st, 1985–2016	92 – 100 cm	32	See eq. 2.14	sind2
March Survey	1st, 1985–2016	100 – 160 cm	32	See eq. 2.14	sind2

The assessment has a retrospective error that may cause some concern. It was taken into account as an additional uncertainty in the evaluation of the harvest rule (Figure 11).

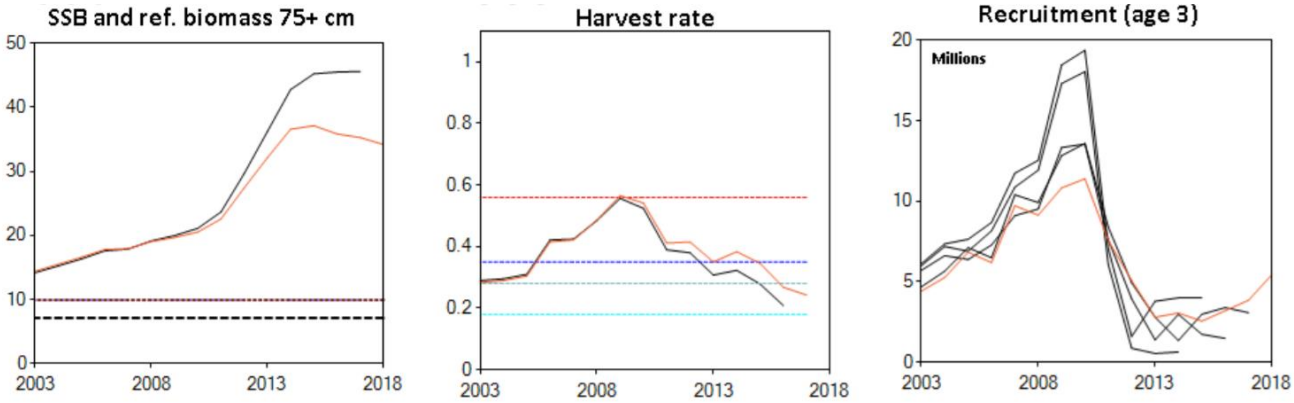

Figure 11. Historic estimates of SSB, harvest rate and recruitment. Only the last two assessments are comparable, as the settings in the assessment method changed in 2017.

1 See: www.hafro.is/gadget; https://github.com/Hafro/gadget

Biological reference points were defined and approved by ICES at the benchmark/harvest rule evaluation in 2017. The key reference is the lowest observed biomass which is taken as a precautionary biomass B_{pa}. The limit biomass B_{lim} is derived from that assuming a safety margin of 40% ($B_{lim} = B_{pa}/1.4$). F-reference points are derived from B_{lim}: F_{lim} has a 50% probability of leading to B_{lim}, and F_{pa} has a 5% probability of leading to B_{lim}.

The preferred measure of exploitation is the harvest rate, which for ling is defined as the catch relative to the biomass of ling >75 cm. The F and harvest rate associated with MSY have been derived by stochastic simulations. In the adopted harvest rule, the harvest rate (0.18) is in the low part of the range leading to near MSY and safely away from the precautionary limits.

3.7. Biomass, Landings and Stock Development

The fishery for ling expanded in the 1950s and was intensive until about 1970, when the fishery by foreign fleets was reduced (Figure 12). Since then catches have been relatively stable in the order of 5,000 tonnes, except for a period around 2010 – 2015, where the occurrence of some unusually large year classes triggered an increase in the catches. Since 1973, for which there is detailed data readily at hand, foreign catches were by Faroese, and in some periods Norwegian vessels, and up till 1978, also by British and German vessels.

The fishery for ling is mostly by long-line (approximately 65%) and trawl (approximately 20%). The proportion by long line is increasing. Previously, some 20-30% was taken by gillnets, this percentage is now reduced to about 5%. Most of the catch in Iceland waters is by Iceland, the rest is by Faroes and Norway, who have an agreement with Iceland on long line fishing.

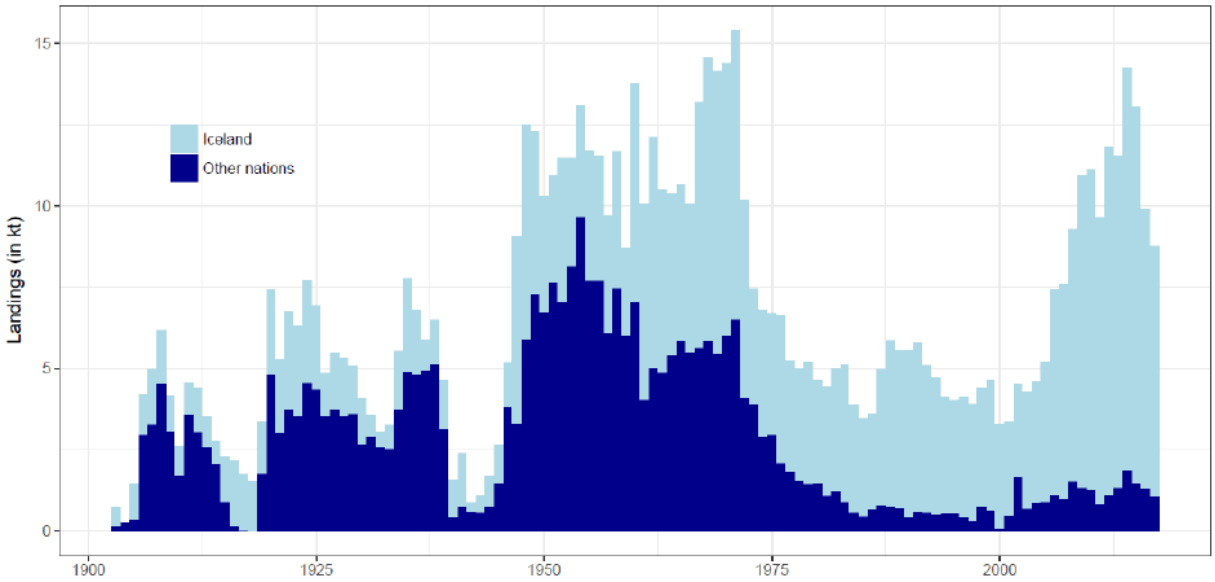

Figure 12. Long term history of catches of ling in Icelandic waters.

Most of the catches are taken on the Western and South Western shelf. In the surveys, the ling is most abundant in the same areas.

The stock biomass is at historical high at present, thanks to a series of exceptionally large year classes that were born in 2006 – 2009, and by now are mature. A similar high recruitment period has been observed for several species that are mostly confined to Southern Iceland, and has been attributed to a period with warmer water. Since then, year classes have been like the past average. Accordingly, the biomass will be reduced in the coming years. The harvest rate has fluctuated, mostly between 0.3 and 0.5, highest in periods with good recruitment. The SSB has been more stable than the harvest rate in the past, i.e. the fishery has taken the surplus after periods with relatively good recruitment (Figure 13).

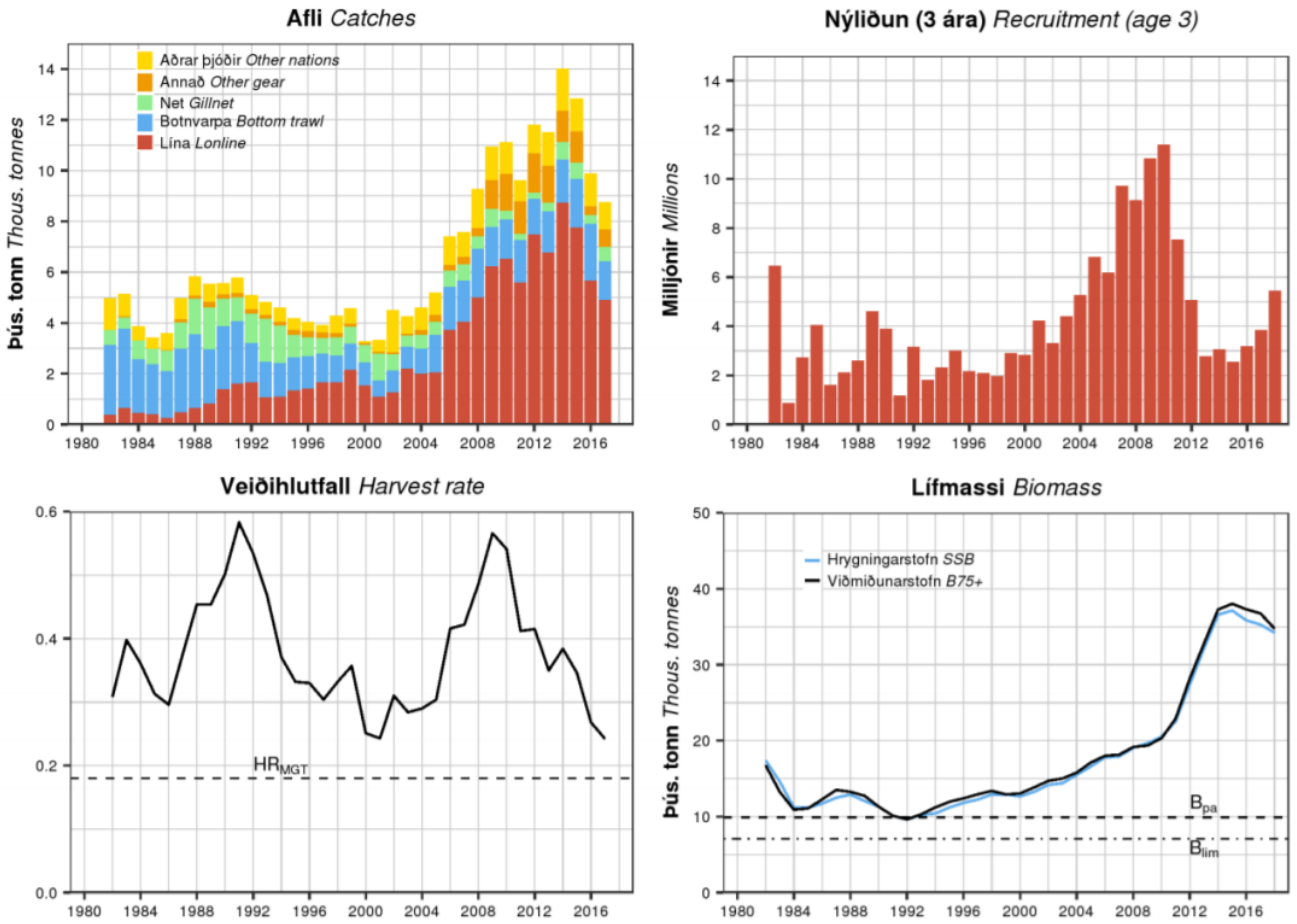

Figure 13. Ling – catches by gear type, recruitment at Age 3, harvest rate and SSB and reference biomass (B75+).

The fluctuations in catches reflect to a large extent fluctuations in the stock, but also variations in fishing mortality. The fishing mortality or harvest rate have been relatively stable most of the time, but with some peaks. The level has been higher than the target HR in the new management plan, but never excessively high. Until around 2000, the stock biomass was relatively stable. Since then, the stock has been increasing, first because of a series of good year classes, and lately because of low mortality.

From 2002/2003 to 2012/2013, landings exceeded both the advice given by MRI and the set TAC. The reasons for the implementation errors are transfers of quota share between fishing years, conversion of TAC from one species to another and catches by Norway and the Faroe Islands by bilateral agreement. The quota to foreign fleets has only recently been taken into account when setting the national TAC. In the more recent years, catches have been close to or below both the advised catch and the Icelandic TAC. In 2015/2016, when the catch was far below the TAC, a substantial part of the national quota was transferred to other species or to next year, and some of it not used.

Under the quota management system TAC overshoots should be balanced in the medium term. Quota balancing mechanisms are discussed further in relevant clause of Section 8.

Table 3. Catches and quotas for ling. From the MFRI presentation of the WGDEEP report: https://www.hafogvatn.is/static/extras/images/Ling_Molva_molva_2018_06729173.pdf.

FISHING YEAR	ADVICE	NATIONAL-TAC	LANDINGS
1999/2000			**3 961**
2000/2001			**3 451**
2001/2002	3 000	3 000	**2 968**
2002/2003	3 000	3 000	**3 715**
2003/2004	3 000	3 000	**4 608**
2004/2005	4 000	4 000	**5 238**
2005/2006	4 500	5 000	**6 961**
2006/2007	5 000	5 000	**7 617**
2007/2008	6 000	7 000	**8 560**
2008/2009	6 000	7 000	**10 489**
2009/2010	6 000	7 000	**10 713**
2010/2011	7 500	7 500	**10 095**
2011/2012	8 800	9 000	**11 133**
2012/2013	12 000	11 500	**12 445**
2013/2014	14 000	13 500	**14 983**
2014/2015	14 300	13 800	**13 166**
2015/2016	16 200	15 000	**11 229**
2016/2017	9 343	8 143	**8 426**
2017/2018	8 598	7 598	
2018/2019	6 255		

4. Proposed Unit(s) of Assessment and Certification

The proposed Units of Certification (UoCs) submitted at the time of Application were reviewed during an initial Validation Assessment to determine their appropriateness. Having reviewed the proposed UoCs, the Assessment Team have determined that they are appropriate. Therefore, the proposed UoCs are as listed in Table 4 below.

Table 4. Unit of Certification.

Common across all UoCs			Unique to each UoC	
Species	**Location of Fishery**	**Principal Management Authority**	**UoC**	**Gear Type**
Common ling (*Molva molva*) Icelandic stock	Iceland 200nm EEZ within FAO Major Fishing Area 27	Ministry of Industries and Innovation (Iceland)	1	Longline
			2	Demersal trawl
			3	Nephrops trawl
			4	Gillnet
			5	Danish seine
			6	Hook-and-line by small vessels
			7	Gears from other Icelandic fisheries also legally landing ling

5. Consultation Meetings

5.1. On-Site Assessment and Consultation Meetings

The objectives of the on-site assessment and consultation meetings were to support information gathering and understanding of the role, functions and activities of organisations responsible for the management of Icelandic fisheries; these meetings covered several stocks so some issues were more general while others were stock specific.

Consultation meetings were planned based on an initial review conducted during the Validation Assessment of the fishery which identified the key management organizations and participants. Meetings were not designed to be inclusive of all organizations involved in the fisheries under assessment; however, the consultation plan was designed to capture sufficient information to ensure understanding and confidence with respect to validation reporting.

All consultation meetings were conducted by Sam Dignan, Lead Assessor, Conor Donnelly, Assessor, Dankert Skagen, Assessor and Gísli Svan Einarsson, Assessor.

Overview of Meeting Plan:
Meetings were held between the 13th and 15th of February 2018, in Reykjavik, Grindavík and Hafnarfjörður, Iceland.

Summary of Consultation Meetings:
Each meeting served to allow the Assessment Team to gather sufficient information about the fishery to score the fishery against the requirements of the IRF Standard and to identify any areas of potential concern within the fishery management system. Table 5 provides a summary of the on-site meetings and a description of the key items discussed at each.

Table 5. Summary of Meetings, Icelandic Ling Commercial Fishery site visits, February 2018.

Meeting Date and Location	Personnel	Areas of discussion
Date: 13/02/2018 **Time** 10:00 **Location:** Reykjavik	**Marine and Freshwater Research Institute (MFRI)** Guðmundur Þórðarson, Head of Demersal Division Þorsteinn Sigurðsson, Head of Pelagic Division **Assessment Team Members:** Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor	**Topics Discussed:** **General on recent developments:** ▪ Recent development of assessment and HCRs, MFRI satisfied, unsolved problems etc. ▪ Important developments in other fields for these stocks. **Assessment data:** Discussion and confirmation of methods of catch sampling including who does what, procedures to ensure representative samples and information on discards for tusk, ling and herring. **International cooperation:** Arrangements for these stocks. General and on stock identity in particular. **Ling and tusk specific:** ***Stock identity:*** ▪ Re. Ling: Population studies (e.g. using molecular genetics), new data, results, other studies etc. ▪ Tusk is shared with Greenland, Ling is a domestic stock. Reasons for this difference. Agreements with other parties on these species and inclusion of other parties catches in assessments/management.

Meeting Date and Location	Personnel	Areas of discussion
		▪ Re tusk: Iceland - Faroe ridge issue. Allocation of tusk on the ridge to particular stocks and links across the ridge. ***Recruitment:*** Dip in recruitment for both stocks around 2013-14 and the big ling year classes around 2010. Reasons for this. Driving forces for recruitment for these stocks. Expectations regarding future recruitment and justifications for the 6 year blocks used in the simulations. **Non-target species information** ▪ Information on status of non-quota species. ▪ Discard prohibition, information on its success, implementation, compliance and enforcement **ETP species information** ▪ 4 vulnerable species identified: Atlantic halibut, common skate, spiny dogfish spurdog, Greenland shark, bycatch data collected on them, e.g. eLogbook, observer records. ▪ Latest information on ETP stock status (or proxies where not available). ***Seabirds, Marine Mammals and ETP impact mitigation*** ▪ For ISS herring fishery, extent to which any measures to address impacts on ETP species (if any) have been considered. ▪ Seal catches in Icelandic fisheries. Significance of this mortality in relation to total seal catches and health of the seal populations, measures that may exist to avoid, minimise and mitigate these impacts. **Habitats** ▪ Identification of spawning and nursery habitats and temporal, spatial closures in place to protect. ▪ Information on stony coral areas and thermal vent structures and closures to protect them/any other Marine Protected Areas. ▪ New information/research on sponge communities. ▪ Exposure of VMEs (corals, hydrothermal vents etc.) to gears, swept area analysis from VMS. **Foodweb** ▪ MFRI research into ecosystem based management, understanding relationships between stocks/species, information on predator-prey relationships. ▪ Role of herring in Icelandic ecosystem. Role as prey/forage.
Date: 13/02/2018 **Time** 13:00 **Location:** Reykjavik	**HB Grandi** Ingimundur Ingimundarson, Pelagic Fleet Manager **Assessment Team Members:** Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor	**Topics Discussed:** **(This meeting related primarily to the concurrent assessment of the ISS herring fishery)** ▪ Fishing practices, pelagic trawls Vs purse seines etc. ▪ Interspecies transfers and herring fishery comparisons with and differences to groundfish. ▪ Industry issues/initiatives particular to these fisheries.

Meeting Date and Location	Personnel	Areas of discussion
	Gísli Svan Einarsson, Assessor	▪ Herring fishery, interactions with marine mammals, recording, measures to avoid etc. ▪ Mixing of herring stocks and accounting for this in quota setting (i.e. Icelandic summer spawning/Atlanto-Scandian herring).
Date: 13/02/2018 **Time** 15:00 **Location:** Reykjavik	**Iceland Responsible Fisheries Foundation (IRFF)** Finnur Garðarsson **Assessment Team Members:** Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor	**Topics Discussed:** ▪ Development of the IRF Programme. ▪ Development of formal FMPs. ▪ Role of Iceland Responsible Fisheries Foundation in these fisheries. ▪ Particular Industry initiatives for these stocks.
Date: 14/02/2018 **Time** 10:00 **Location:** Hafnarfjörður	**Fisheries Directorate** Þorsteinn Hilmarsson, Head of Services and information Áslaug Eir Hólmgeirsdóttir, Head of Surveillance **Assessment Team Members:** Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor	**Topics Discussed:** ***Management:*** ▪ Quotas for Faroes and Norway, accounting for these when setting Icelandic quotas, utilization of these quotas. ▪ Herring, mixture with spring spawners, impacts with regards to quotas. ▪ Arrangements with other nations who are permitted to fish in Icelandic waters. ***Management plan documentation:*** ▪ Formal documentation of FMPs, web addresses for official versions of the management plans. ***Transparency:*** ▪ Use of relevant traditional, fisher and/or community information and/or knowledge. ▪ Ensuring transparency, channels for communication formal and informal. **Loss of gear/ghost fishing and discarding** ▪ Information and steps taken to avoid. ▪ Discard prohibition, information on its success, implementation, compliance and enforcement. **Reporting** ▪ E-logbook reporting of non-target catches, is a requirement and the Trackwell system has the facility but is it being used/policed? **Seabirds, Marine Mammals and ETP impact mitigation** ▪ Information on protection of ETP species in Icelandic law and international conventions that apply. List of protected species; halibut and…?). ▪ Icelandic seal catches, lumpsucker gillnet fishery, significance of this mortality, measures that may exist to avoid, minimise, mitigate these impacts. **Habitats**

Meeting Date and Location	Personnel	Areas of discussion
		▪ Temporal and spatial closures in place to protect spawning and nursery habitats, stony coral areas and thermal vents. ▪ Legal basis for closures and any evaluations of the success of these measures. ▪ Protection of sponge communities. ▪ Government policy on protection of VMEs and regulations put in place.
Date: 14/02/2018 **Time** 13:00 **Location:** Reykjavik	**Coastguard** Björgólfur H. Ingason, Chief controller, Icelandic Coast Guard **Assessment Team Members:** Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor	**Topics Discussed:** ▪ Intro to Icelandic Monitoring, Control and Surveillance (MCS) systems. ▪ Enforcement Laws and Regulations. Amendments or changes to the Icelandic enforcement laws. ▪ Changes to e-reporting system (bilateral agreement with Norway). Anything from Faroes yet? ▪ Monitoring the herring fishery. ▪ Boardings and violations (as well as type) have been carried out by the ICG during 2017. ▪ Policing of foreign vessels fishing in Icelandic waters. ▪ Significant violations which undermined directly the management of the Icelandic fisheries. ▪ Prosecutions and reprimands against skippers/vessels. ▪ Changes in 2017 in the systems or patrolling vessels used for enforcement.
Date: 14/02/2018 **Time** 15:00 **Location:** Reykjavik	**Fisheries Iceland** Kristján Þórarinsson **Assessment Team Members:** Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor	**Topics Discussed:** ▪ Formal FMPs in place including how are these documented and whether they are publically available. ▪ Role of Fisheries Iceland in these fisheries. ▪ Particular Industry initiatives for these stocks. ▪ Research into technical measures to reduce bycatch. ▪ Tusk's treatments as an Icelandic and not a shared stock. ▪ Accounting for foreign vessels within ling quota.
Date: 15/02/2018 **Time** 10:00 **Location:** Grindavík	**Vísir hf.** Pétur Hafsteinn Pálsson, Manager Erla Ósk Pétursdóttir, HR and Development Manager **Assessment Team Members:** Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor	**Topics Discussed:** ▪ Fishing practices in these fisheries. ▪ Are ling/tusk primarily longline fisheries? ▪ Industry issues particular to these fisheries. Mitigation of bycatch, tori lines, night setting etc. ▪ Particular Industry initiatives for these stocks. ▪ Interactions with marine mammals, recording, measures to avoid etc. (primarily in gillnets). ▪ Consistent undershooting of ling quota in recent years.
Date: 15/02/2018 **Time** 13:00 **Location:** Reykjavik	**National Association of Small Boat Owners** Örn Pálsson, Manager Axel Helgason, Chairman of the Board **Assessment Team Members:** Sam Dignan, Lead Assessor	**Topics Discussed:** ▪ There was a lot of discussion around lumpfish that was not particularly relevant to this assessment. ▪ Management (Differences in small boat rules and regulations, compared to larger vessels). ▪ Small boats involvement in these fisheries. ▪ Longline discount for these species. ▪ Allocation of quotas to small boats.

Meeting Date and Location	Personnel	Areas of discussion
	Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor	▪ Gear restrictions/technical measures applicable to these species for small boats (Mesh sizes, sorting grids). ▪ Particular issues regarding small boats and these stocks. ▪ Particular Industry initiatives for these stocks.

6. Assessment Outcome Summary

The Assessment Team has documented the available evidence that addresses each of the clauses of the IRF Standard and the available evidence from each section shall be assigned a confidence based rating (high, medium or low) which signifies the confidence of the Assessment Team in the level of information that demonstrates conformity of the fishery at meeting a particular clause.

Confidence Ratings are defined as follows:

- **Low Confidence Rating (resulting in a Critical Non-Conformance)**
  - Information/evidence is completely absent or contradictive to demonstrating compliance of a fishery to the requirements of a clause.
- **Medium Confidence Rating (resulting in a Major Non-Conformance)**
  - Information/evidence is limited that demonstrates conformance of a fishery to the requirements of a clause.
- **Medium Confidence Rating (resulting in a Minor Non-Conformance)**
  - Information/evidence is broadly available that demonstrates conformity to a clause although there are some gaps in information that if available would clarify aspects of conformity and allow the Assessment Team to assign a higher level of confidence.
- **High Level of Confidence (resulting in a Full Conformance)**
  - Sufficient information/evidence is available to demonstrate conformance to a given supporting clause, a high level of confidence can be assigned.

A critical non-conformance essentially stops an assessment (not allowing for certification) unless or until the applicant is able to provide additional information/evidence that supports a higher confidence level; therefore, a Certification Body (CB) shall not certify a fishery unit of certification with an open Critical Non-Conformance. In addition a CB shall not certify a unit of certification with one or more outstanding Major and/or Minor Non- which have not been addressed by an accepted Corrective Action Plan.

6.1. Assessment Outcome by Section

The scoring outcomes for each section of the IRF Standard are presented in Table 6 below.

Table 6. Conformance levels for each section of the IRF Standard assigned during this assessment.

Section	Critical	Major	Minor	Full	Outcome
1. Fisheries Management	0	0	0	58	Pass
2. Compliance and Monitoring	0	0	1	37	Pass – Corrective Action Plan Required
3. Ecosystem Considerations	0	0	0	15	Pass
Overall	***0***	***0***	***1***	***110***	***Pass with Corrective Action Plan***

6.2. Assessment Outcome by Scoring element

The scoring outcomes for each scoring element of the IRF Standard are presented in Table 7 below.

Table 7. Conformance levels for each scoring element of the IRF Standard assigned during this assessment.

Section	Clause (Scoring Element)				Applicable	Low	Medium		High	Conformance level	NC No.
						Critical	Major	Minor	Full		
1	1.1	1.1.1			Yes				x	Full	
		1.1.2			Yes				x	Full	
		1.1.3			Yes				x	Full	
		1.1.4			Yes				x	Full	
		1.1.5			Yes				x	Full	
		1.1.6			Yes				x	Full	
		1.1.7			Yes				x	Full	
		1.1.8	1.1.8.1		Yes				x	Full	
			1.1.8.2		Yes				x	Full	

Section	Clause (Scoring Element)				Applicable	Low	Medium		High	Conformance level	NC No.
						Critical	Major	Minor	Full		
			1.1.8.3		Yes				x	Full	
			1.1.8.4		Yes				x	Full	
		1.1.9	1.1.9.1		Yes				x	Full	
			1.1.9.2		Yes				x	Full	
			1.1.9.3		Yes				x	Full	
			1.1.9.4		Yes				x	Full	
		1.1.10	1.1.10.1		Yes				x	Full	
			1.1.10.2		Yes				x	Full	
			1.1.10.3		Yes				x	Full	
			1.1.10.4		Yes				x	Full	
			1.1.10.5		Yes				x	Full	
			1.1.10.6		Yes				x	Full	
			1.1.10.7		Yes				x	Full	
	1.2	1.2.1			Yes				x	Full	
		1.2.2			Yes				x	Full	
		1.2.3			Yes				x	Full	
		1.2.4	1.2.4.1		Yes				x	Full	
			1.2.4.2		Yes				x	Full	
			1.2.4.3		Yes				x	Full	
		1.2.5			Yes				x	Full	
		1.2.6			Yes				x	Full	
		1.2.7			Yes				x	Full	
	1.3	1.3.1	1.3.1.1		Yes				x	Full	
			1.3.1.2		Yes				x	Full	
			1.3.1.3		Yes				x	Full	
			1.3.1.4		Yes				x	Full	
			1.3.1.5		Yes				x	Full	
			1.3.1.6		Yes				x	Full	
		1.3.2	1.3.2.1	1.3.2.1.1	Yes				x	Full	
				1.3.2.1.2	Yes				x	Full	
			1.3.2.2	1.3.2.2.1	Yes				x	Full	
				1.3.2.2.2	Yes				x	Full	
				1.3.2.2.3	Yes				x	Full	
				1.3.2.2.4	Yes				x	Full	
			1.3.2.3	1.3.2.3.1	Yes				x	Full	
				1.3.2.3.2	Yes				x	Full	
				1.3.2.3.3	Yes				x	Full	
	1.4	1.4.1			Yes				x	Full	
		1.4.2			Yes				x	Full	
	1.5	1.5.1			Yes				x	Full	
		1.5.2			Yes				x	Full	
		1.5.3			Yes				x	Full	
		1.5.4			Yes				x	Full	
		1.5.5			Yes				x	Full	
		1.5.6			Yes				x	Full	
		1.5.7			Yes				x	Full	
		1.5.8			Yes				x	Full	
		1.5.9			Yes				x	Full	
		1.5.10			Yes				x	Full	
2	2.1	2.1.1			Yes				x	Full	
		2.1.2			Yes				x	Full	
	2.2	2.2.1			Yes				x	Full	

Section	Clause (Scoring Element)				Applicable	Low	Medium		High	Conformance level	NC No.
						Critical	Major	Minor	Full		
		2.2.2			Yes				x	Full	
		2.2.3			Yes				x	Full	
		2.2.4	2.2.4.1		Yes				x	Full	
			2.2.4.2		Yes				x	Full	
			2.2.4.3		Yes				x	Full	
	2.3	2.3.1	2.3.1.1		Yes				x	Full	
			2.3.1.2		Yes				x	Full	
			2.3.1.3		Yes				x	Full	
			2.3.1.4		Yes				x	Full	
		2.3.2	2.3.2.1		Yes				x	Full	
			2.3.2.2		Yes				x	Full	
			2.3.2.3		Yes				x	Full	
			2.3.2.4		Yes			x		Minor	1
			2.3.2.5		Yes				x	Full	
			2.3.2.6		Yes				x	Full	
			2.3.2.7		Yes				x	Full	
			2.3.2.8		Yes				x	Full	
			2.3.2.9		Yes				x	Full	
			2.3.2.10		Yes				x	Full	
			2.3.2.11		Yes				x	Full	
			2.3.2.12		Yes				x	Full	
			2.3.2.13		Yes				x	Full	
			2.3.2.14		Yes				x	Full	
			2.3.2.15		Yes				x	Full	
			2.3.2.16		Yes				x	Full	
			2.3.2.17		Yes				x	Full	
		2.3.3	2.3.3.1		Yes				x	Full	
			2.3.3.2		Yes				x	Full	
			2.3.3.3		Yes				x	Full	
			2.3.3.4		Yes				x	Full	
			2.3.3.5		Yes				x	Full	
		2.3.4	2.3.4.1		Yes				x	Full	
		2.3.5	2.3.5.1		Yes				x	Full	
			2.3.5.2		Yes				x	Full	
			2.3.5.3		Yes				x	Full	
3	3.1	3.1.1			Yes				x	Full	
		3.1.2			Yes				x	Full	
	3.2	3.2.1	3.2.1.1		Yes				x	Full	
			3.2.1.2		Yes				x	Full	
		3.2.2	3.2.2.1		Yes				x	Full	
			3.2.2.2		Yes				x	Full	
			3.2.2.3		Yes				x	Full	
			3.2.2.4		Yes				x	Full	
			3.2.2.5		Yes				x	Full	
		3.2.3	3.2.3.1		Yes				x	Full	
			3.2.3.2		Yes				x	Full	
			3.2.3.3		Yes				x	Full	
			3.2.3.4		Yes				x	Full	
		3.2.4	3.2.4.1		Yes				x	Full	
		3.2.5	3.2.5.1		Yes				x	Full	

7. Conformity statement

The assessment team recommends that the management system of the applicant fisheries, Icelandic common ling (*Molva molva*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished with longlines, demersal otter trawls (also known as bottom trawls), gillnets, Nephrops trawls, Danish seine nets, hook-and-line by small vessels and gears from other Icelandic fisheries also legally landing common ling within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), be granted certification.

8. Fishery Assessment Evidence

8.1. Section 1: Fishery Management

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

The Fisheries Management System

8.1.1.1. 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, including ling. 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 stock is managed according to a publicly available management system. The main management measures include TACs in an ITQ system, set according to a harvest rule approved by ICES, area closures to protect undersized and spawning fish and mesh size regulations.

Evidence:

Iceland has a structured management system that covers all commercial species, including ling. There is a principal Act (Lög um stjórn fiskveiða, nr. 116; 10. August 2006[2]) and a number of supporting Acts and Regulations for the management of the fishery[3].

Article 1 in the principal act states the overall objective for Icelandic fisheries management: *Nytjastofnar á Íslandsmiðum eru sameign íslensku þjóðarinnar. Markmið laga þessara er að stuðla að verndun og hagkvæmri nýtingu þeirra og tryggja með því trausta atvinnu og byggð í landinu. (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[4])* Policies incorporate a number of International Agreements, including; UN Convention of the Law of the Sea, Agenda 21 of the Rio Declaration, FAO Code of Conduct for Responsible Fisheries and the International Plan of Action to prevent, deter and eliminate Illegal, Unregulated and Unreported Fishing.

There are a number of inter-related government agencies within the system under the direction of the Ministry of Industries and Innovation (MMI)[5]. The Ministry acts according to law issued by the parliament (Alþingi), and according to advice from the Marine and Freshwater Research Institute (MFRI)[6]. The executive body is the Fisheries Directorate (Fiskistofa)[7]. The coast guard[8] is responsible for control at sea, both of the catches and the quality of the vessels.

The Ministry of Industries and Innovation (MMI) was established 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. The MII covers all sectors of ordinary business and economic activity and including the ultimate responsibility for fisheries management (Figure 14). It is led by two ministers, one of which is responsible *inter alia* for the fisheries management.

2 http://www.althingi.is/lagas/148a/2006116.html
3 http://www.althingi.is/lagasafn/kaflar/nuna/33.html; https://www.stjornarradid.is/verkefni/atvinnuvegir/sjavarutvegur-og-fiskeldi/
4 This translation was provided in the web-pages of the Ministry, but has disappeared as the webpages have been re-organized earlier this year. The Icelandic version is the only official one.
5 http://www.responsiblefisheries.is/seafood-industry/management-and-control-system/
6 https://www.hafogvatn.is/en
7 http://www.fiskistofa.is/
8 http://www.lhg.is/english

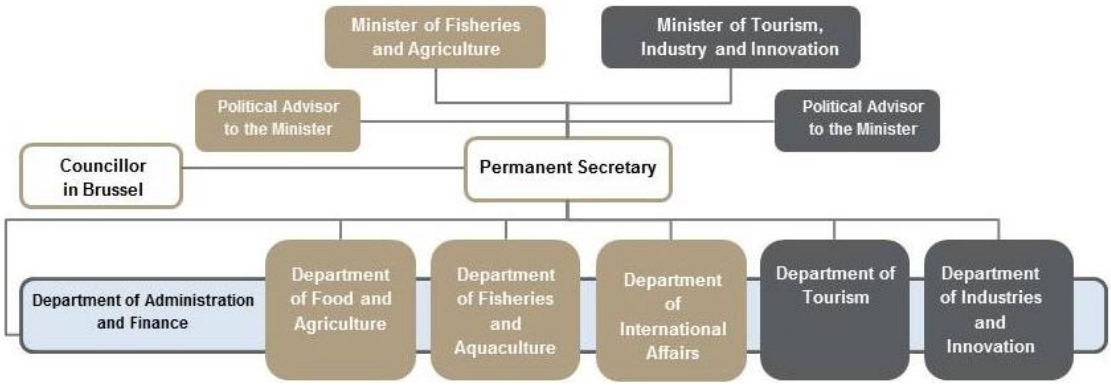

Figure 14. Organisational chart of the Ministry of Industries and Innovation.

The **Directorate of Fisheries (Fiskistofa)** has its HQ in Akureyri and offices at 6 locations in the country including Hafnarfjörður just outside of Reykjavik. The Directorate notes (in consultation meetings) that the strategy of having local offices based in the fishing regions provides the best form of intelligence, support from industry to respect and follow the control rules and provide a conduit for information from fishers' to government on the performance of fishing at any point in time.

Operationally, the Directorate of Fisheries is responsible for the implementation of Fishery Regulations on behalf of the Ministry. A large part of the at sea surveillance falls directly under the responsibility of the Icelandic Coast Guard. Key functions of the Directorate of Fisheries include:

- Implementation of regulations
- Collection and collation of fishery catch data
- Supporting research, survey work
- Supporting Coastguard and surveillance activities
- Managing and policing the Icelandic ITQ system

The Icelandic Coast Guard

The Icelandic Coast Guard (ICG) is a civilian law enforcement agency that is responsible for search and rescue, maritime safety and security surveillance, and law enforcement in the seas surrounding Iceland. 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 Defence 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 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 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, southwest, and east of Iceland.

The Coast Guard is also responsible for maritime rescue operations in the Icelandic Search and Rescue Region which is an area of 1.9 million square kilometres, or more than twice the area of the EEZ. The Coast Guard operates the Joint Rescue and Coordination Centre (JRCC), which is a combined centre and a single point of contact for all the ICG's activities. There is a 24-hour watch in order to react to emergency calls as quickly as possible. At the centre all information on maritime traffic is collected and used jointly for Safety, Security, Fisheries Enforcement and general policing of the ocean. It is necessary for the ICG to maintain thorough information on the location of ships and boats. Accordingly, if the tracking of vessels indicates irregularities, the first response will be to call up the vessel to see if it has problems, and to mobilize assistance, typically from vessels in the vicinity.

In 2011 the Coast Guard received a new flagship vessel named Thor that became active in November. Thor was specially designed for Icelandic conditions, particularly for protection of resources, fisheries monitoring, law enforcement and search & rescue. The Coast Guard also operates rescue helicopters and a maritime surveillance aircraft

The Marine and Freshwater Research Institute (MFRI) 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 (Law 112-2015[9]) and its remit was recently extended to include inland waters. The MFRI has a staff of about 130 with sections for demersal resources, pelagic resources, aquaculture, freshwater resources and the marine environment, as well as supporting sections, including sampling and computing. The three main tasks related to marine resources carried out by the MFRI are:

- To conduct research on the marine environment around Iceland and its living resources
- To provide advice to the government on catch levels and conservation measures.
- To inform the government, the fishery sector and the public about the sea and its living resources.

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[10].

The management system.

The backbone of Icelandic fish stock management is catch quotas (TACs) that are distributed on the participating vessels through an ITQ (transferable individual quotas) system. In addition, management includes technical measures, area closures, and reporting obligations through log-books, monitoring of landings and satellite tracking of the vessels (VMS). The overall TAC is set by the Ministry taking advice from MFRI which again gets internationally approved advice from ICES where Iceland participates.

Since 2017, advice from ICES and MFRI is given according to an adopted management plan. Unless there are very strong reasons for not doing so, MFRI will follow the advice from ICES and the Ministry will follow the advice from MFRI, but neither of them is formally bound by the advice they receive. The ITQ system is managed by the Directorate. That includes distributing the annual TAC on vessels, monitoring the catches vs. TACs and organizing exchange of quotas. The Coast Guard performs surveillance and control at sea and monitoring of VMS information. It also approves and controls the technical state of vessels and the qualifications of the crew, and coordinates search and rescue operations.

References:	See footnotes.

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

8.1.1.2. 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 key management tool is TACs, distributed on the fleet in an ITQ system. The overall TAC is set according to a harvest control rule, as 18% of the standing biomass of ling above 75 cm. There is some flexibility to transfer quotas between species and between years. Discards is prohibited. Ling can only be landed in designated ports, where they are weighed and reported by authorized personnel. 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 to land undersized fish for a reduced price.

Evidence:

There is a suite of monitoring and control measures in place, to keep catches in conformity with allowed amounts. [11] These are noted below and also described in further detail in Clause 1.5.8 and Section 2.

9 https://www.althingi.is/lagas/nuna/2015112.html
10 http://www.hafro.is/undir_eng.php?ID=20&REF=3
11 http://www.responsiblefisheries.is/seafood-industry/management-and-control-system/

The key element in the management of Iceland's commercial fish stocks, including ling, is output control through a total allowable catch (TAC) that is distributed on the participating vessels by an ITQ system. ITQs for ling were introduced in 1984.

The overall TAC is set by the Ministry **of Industries and Innovation**, according to advice from the MFRI. The overall TAC is derived according to an adopted harvest rule that is applied to the estimate of stock abundance coming from an analytic stock assessment. The assessment and primary advice on the TAC is done by ICES, where both Icelandic scientists and scientists from other nations participate. **The Ministry** bases its policy decisions on annual total allowable catch on the recommendations of the MFRI as well as consultation with stakeholders. In practice the Ministry follows almost all recommendation by the MFRI and very compelling and concrete arguments have been needed in the few instances in later years when the Ministry has allowed bigger total allowable catches than recommended by the Institute[12].

After the overall annual TAC is decided, the detailed catch limitation (output control) is through individual transferable quotas (ITQs)[13];

- 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. Quota transfer is mainly intended to promote rationalisation and thus increase profitability in the industry.
- Exceptions include: Community quotas (not based on vessels‘s quota share, all other provisions apply; limited amount); summer inshore handline (jigging) fishery (limited amount).

Altogether, there is strong emphasis on making the system flexible and to reduce incentives for violations, while maintaining a firm control.

To ensure correct catch reporting, it is mandatory to land catches of all species, including ling, in authorized ports, where they are weighed by officially licensed weighers. These weights are reported online to the Directorate and are the primary source of catch statistics to be used in stock assessments. 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. The data is processed in the Directorate´s database and catches are subtracted from the vessel´s quotas. The information is publicly available in real-time[14]. The system is designed so that the Directorate can act quickly if vessels have overfished their quotas. Excess catches can result in a revocation of fishing licenses.

There are several arrangements in place to reduce the incentive for discarding and black landings. To legally land fish, the vessel needs a quota, and if it does not have one, it will have to buy it. There is a very efficient system for buying and selling quotas on-line. There is also some opportunities to transfer quotas between years and to some extent between species (including ling). Undersized fish shall also be landed. It can be sold, but the vessel only gets a fraction of the price, the rest goes to a fund that is used to promote research. The fisheries directorate can have inspectors on board, and the movements and operations of all vessels are closely monitored by the Coast guard, both for control and for security purposes.

Discards is prohibited in Icelandic fisheries. Estimates of discards have been provided regularly for cod and haddock. For ling, an estimate was made in 2011[15]. Apart from that, surveillance by inspectors from the Directorate of Fisheries during each fishing season is considered adequate in verifying if a discard is ongoing.[16]

12 http://www.fiskistofa.is/english/fisheries-management/
13 http://www.responsiblefisheries.is/seafood-industry/management-and-control-system/
14 http://www.fiskistofa.is/english/quotas-and-catches/
15 Thordarson, G. (2011) Estimates of tusk and ling discards in the Icelandic longline fishery. WGDEEP-2011:WD02; pages 10-18: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2011/WGDEEP/wgdeep_Annex02_WorkingDocuments_2011.pdf
16 Discussions at site visit at MFRI 13 Feb. 2018

Table 8 below shows the recent historical record of adherence to the quotas, according to the MFRI advice[17]. The deviations go in both directions. Deviations can be caused by transfer between years and between species. Except for the most recent years, catches allowed by foreign vessels were not accounted for when setting Icelandic quotas. Still, the agreement with Faroes and Norway does not specify quotas on species level, hence accounting for their share of the ling quota is based on experience.

Table 8. TAC and catch in recent history. From MFRI Assessment Reports 2018[18].

FISHING YEAR	ADVICE	NATIONAL-TAC	LANDINGS
1999/2000			**3 961**
2000/2001			**3 451**
2001/2002	3 000	3 000	**2 968**
2002/2003	3 000	3 000	**3 715**
2003/2004	3 000	3 000	**4 608**
2004/2005	4 000	4 000	**5 238**
2005/2006	4 500	5 000	**6 961**
2006/2007	5 000	5 000	**7 617**
2007/2008	6 000	7 000	**8 560**
2008/2009	6 000	7 000	**10 489**
2009/2010	6 000	7 000	**10 713**
2010/2011	7 500	7 500	**10 095**
2011/2012	8 800	9 000	**11 133**
2012/2013	12 000	11 500	**12 445**
2013/2014	14 000	13 500	**14 983**
2014/2015	14 300	13 800	**13 166**
2015/2016	16 200	15 000	**11 229**
2016/2017	9 343	8 143	**8 426**
2017/2018	8 598	7 598	
2018/2019	6 255		

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

8.1.1.3. 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 main measure for conservation and sustainable use is an overall TAC, distributed in an ITQ system. In addition, area closures, both temporary and permanent, are used to protect juveniles and discards is banned.

Evidence:
The main instrument for the conservation and sustainable use of the ling resource is quotas, as described under Clause 1.1.2. The overall quota is distributed to individual vessels as ITQs. In addition, there is a suite of measures to support the adherence to the quotas and to reduce adverse impact of the fishery on the environment. These include area closures and a discard ban.

The fishery for ling is conducted mostly with long line, and to a lesser extent with trawl. Gill net was commonly used previously, but now takes only about 6-8% of the catches. Most of the fishery takes place in the South-West (Figure 15). In the trawl fishery, the general mesh size regulations apply (135 mm, or 150 mm when using 'Polish cover').

17 https://www.hafogvatn.is/static/extras/images/Keila_2018729226.pdf
18 https://www.hafogvatn.is/static/extras/images/Ling_Molva_molva_2018_06729173.pdf

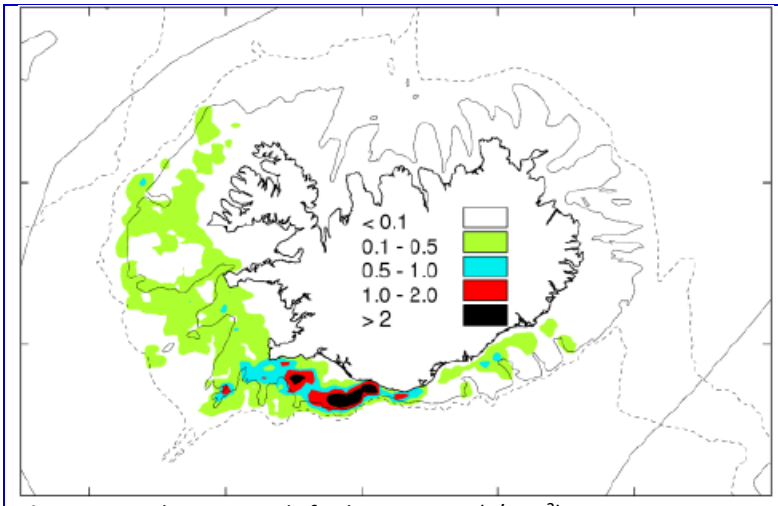

Figure 15. Fishing grounds for ling in 2017 (t/nmi^2).

A system of instant area closures is in place for many species, if the amount of juveniles becomes too high including ling. This system is managed by MFRI. There is no minimum landing size for ling since all catch has to be landed. Because of repeated instant area closures off the south and southeast coast of Iceland in 2003, four areas were closed permanently by the Ministry for longline fisheries, primarily to protect juvenile tusk (Figure 16).

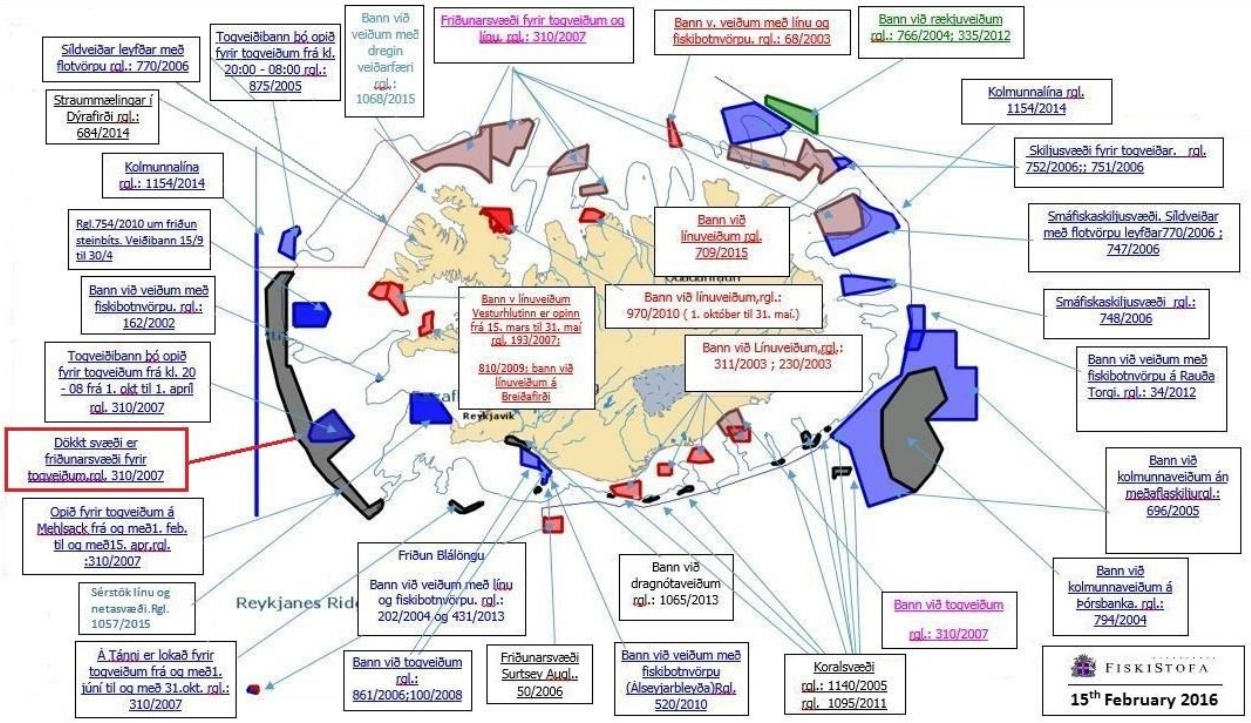

Figure 16. Overview of Marine protected areas in Icelandic waters. Four areas marked red in the south and southeast of Iceland are permanently closed for longline fisheries in order to protect juvenile tusk. Trawling does not occur within these areas (Source: Directorate of Fisheries).

Discard are prohibited in Icelandic fisheries, as noted in clause 1.1.2. Surveillance by inspectors from the Directorate of Fisheries during each fishing season is considered adequate in verifying if a discard is ongoing.[19]

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

19 http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2017/her.27.5a_SA.pdf; Section B1.2

8.1.1.4. 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: Legal Instruments are in force which specify 'legal gears' for each method of fishing (Act 57/1996)[20]. It also requires the regulation of fishing gear so as to reduce damage to catch and also to allow confiscation of gear not retrieved in a proper manner, found in closed areas, fishing illegally or being illegal. Also Article 9 of Act No. 79/1997[21] 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.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.1.5. 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: **The assessment and advice of ling by ICES is documented in the WGDEEP report and the ICES advice. This advice is taken over by MFRI, who provides the formal Icelandic TAC advice to the Ministry. Both the ICES assessment, the ICES advice and the MFRI advice are accessible on internet. This advice is adopted by the Ministry, and implemented as individual quotas by the Directorate. The quota status both overall and for individual vessels is very transparent, being published almost in real-rime on the Directorate website.**				
Evidence: The ling is managed according to the general arrangements for managing fish resources in Iceland. The general legal framework covers the general management policy (Law nr 116) and a suite of laws and regulations covering all aspects of fisheries management. Specific to ling is a harvest rule which was adopted in 2017[22] after being evaluated by ICES[23] and found to be in accordance with the precautionary approach. According to this rule, the TAC is set at 18% of the fishable biomass 75 cm and larger. This percentage is reduced linearly with SSB towards the origin if SSB is below 9930 tonnes. It can be noted that the top of yield curve is rather flat, so the loss in expected yield by applying a harvest rate of 0.18 rather than the MSY harvest rate of 0.24 is only about 2% The assessment and advice by ICES is documented in the WGDEEP report and the ICES advice. This advice is taken over by MFRI, who provides the formal Icelandic TAC advice to the Ministry. Both the ICES assessment[24], the ICES advice[25] and the MFRI advice[26] are accessible on internet. This advice is adopted by the Ministry, and implemented as individual quotas by the Directorate. The total TAC is partitioned by the Directorate into individual quotas (ITQs) according to quota shares attached to each vessel. Transferable quota shares have been distributed to individual fishing vessels on				

20 http://www.althingi.is/lagas/148b/1996057.html
21 http://www.althingi.is/lagas/148b/1997079.html
22 https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2017/07/03/Aflaregla-fyrir-keilu-og-longu/
23 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/Iceland.2017.09.pdf
24 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGDEEP/05%20WGDEEP%20Report%20-%20Sec%2004%20Ling%20(Molva%20molva)%20in%20the%20Northeast%20Atlantic.pdf; Section 4.4
25 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/lin.27.5a.pdf
26 https://www.hafogvatn.is/static/extras/images/Langa_2018729172.pdf

the basis of their catches during the three years prior to the introduction of the stock into the quota system. The individually transferable quota shares and catch quotas are the cornerstone of the Icelandic fisheries management system. The system is intended to limit the total catch and to ensure that catches are in line with total allowable catch. The system is sufficiently flexible to allow a vessel to design its quota portfolio by selling quotas that it does not need and buying those that it wants. Likewise, since it is prohibited to land fish without a quota and discarding is prohibited, the vessel will have to buy the necessary quota. There is an auction system for such trading. The quota status both overall and for individual vessels is very transparent, being published almost in real-rime on the Directorate website[27]. Here, both available quotas and recorded landings can be followed for every vessel and for every harbour.

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

8.1.1.6. 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:
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.

Evidence:
The Ministry can close areas for certain gears. 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.

The Icelandic system of Individual Transferable Quotas (ITQs), includes provisions for allocations of quota to be reserved for local fisheries. This has the added benefit of serving to avoid potential tensions/conflicts between fishing sectors.

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

27 Options can be selected at http://www.fiskistofa.is/english/quotas-and-catches/

The Fisheries Management Plan

8.1.1.7. 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.[28]

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **The management of ling is part of the general fisheries management in Iceland, and rules and regulations that apply in general apply to ling as well. Some elements are specific to ling, in particular the recently introduced harvest rule. Taken together, this set of rules and regulations can be regarded as a fisheries management plan. The elements are in place, documented and publicly available.**				
Evidence: The management of ling is part of the general fisheries management in Iceland, and rules and regulations that apply in general apply to ling 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, a bottom trawl survey, 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 ling, in particular the harvest rule. Taken together, these elements can be regarded as a fisheries management plan. These elements are in place, documented and publicly available.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.1.8. 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 management unit is the ling in Icelandic waters. This is regarded as a separate stock and is managed by Iceland as such. The long-term harvesting policy is to harvest the stock according to a harvest rule which leads to a near maximum long-term yield and is consistent with the precautionary approach.**				
Evidence: The management unit is ling (*Molva molva*) in Icelandic waters. This is regarded as a separate stock. Ling is widespread in the whole North Atlantic, and the stock structure is poorly known, but substantial migrations between the main				

28 FAO Code of Conduct, art. 7 .3.3.

areas of occurrence is regarded as quite unlikely[29]. More recent genetic studies support the perception of Icelandic ling as a separate management unit[30].

The general long term management objective of fisheries management in Iceland is stated in Article 1 in the principal act (Act number 116/2006): *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[31].*

In a common policy statement[32] the Ministry, Directorate and MRFI declare: *Icelanders have structured a fisheries management system to ensure responsible fisheries, focusing on the sustainable utilization of the fish stocks and good treatment of the marine ecosystem. The fisheries management in Iceland is primarily based on extensive research on the fish stocks and the marine ecosystem, decisions made on the conduct of fisheries and allowable catches on the basis of scientific advice, and effective monitoring and enforcement of the fisheries and the total catch. These are the main pillars of the Icelandic fisheries management intended to ensure responsible fisheries and the sustainability of the ocean's natural resources.*

Consistency with the precautionary approach is achieved by output regulation in terms of quota regulation, where the quotas are set according to a rule that has been evaluated to be in accordance with the precautionary approach. The HCR is designed to provide a near maximum long term yield while maintaining a high SSB.

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

8.1.1.9. 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.)[33], 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 main instrument for ensuring sustainable exploitation is output control through quotas. The quotas are set according to an agreed harvest control rule. The rule has a target value (18%) for the harvest rate (TAC in percent of the fishable (75+ cm) biomass). There is no explicit stock biomass target, but the target harvest rate is reduced if the SSB is below 9,930 tonnes.

Evidence:

The main instrument for ensuring sustainable exploitation is output control through quotas. The quotas are set according to an agreed target harvest rate, that has been shown in simulations to imply a low risk of depleting the stock through recruitment failure, and to lead to a near maximum long-term yield. This exploitation regime has been approved by ICES as precautionary. In addition, there is a suite of supportive measures in particular to avoid exploitation of juveniles, and to reduce adverse effects on the ecosystem. There is an extensive system in place to ensure adherence to the decided quotas.

29 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2007/WGDEEP/Sec-04-%20Stock%20Identity.pdf

30 Blanco et al., (2015). Genetic analyses of ling (Molva molva) in the Northeast Atlantic reveal patterns relevant to stock assessments and management advice. ICES Journal of Marine Science, 72: 635 – 641.

31 This translation was previously provided in the web-pages of the Ministry. The Icelandic version is the only official one.

32 http://www.responsiblefisheries.is/seafood-industry/management-and-control-system/statement-on-responsible-fisheries/

33 Flim can be explicit, or implicit in cases where harvest rate is set annually to a precautionary Flim (or its proxy)].

A harvest control rule (HCR) for ling was evaluated, approved[34] and adopted in 2017[35] It has a target value (18%) for the harvest rate (TAC in percent of the fishable (75+ cm) biomass), which is a proxy for a target fishing mortality. A biomass target is considered redundant, and is not defined. The HCR has a breakpoint for the spawning stock biomass at 9930 tonnes, below which the harvest rate is reduced linearly towards the origin. If SSB falls below that level, the harvest rate is reduced to 0.18*SSB/9,930.

A limit reference point Blim for the spawning stock biomass (SSB) is established at 7,090 tonnes. Simulations show a low (<5%) risk of bringing the SSB below the limit when harvesting at the target harvest rate (18%). (Figure 17). The target harvest rate is somewhat below H_{MSY}. This is done to be on the safe side and avoid surprising reductions in yield due to assessment uncertainty. The loss in long term yield compared to fishing at H_{MSY} is about 4%.

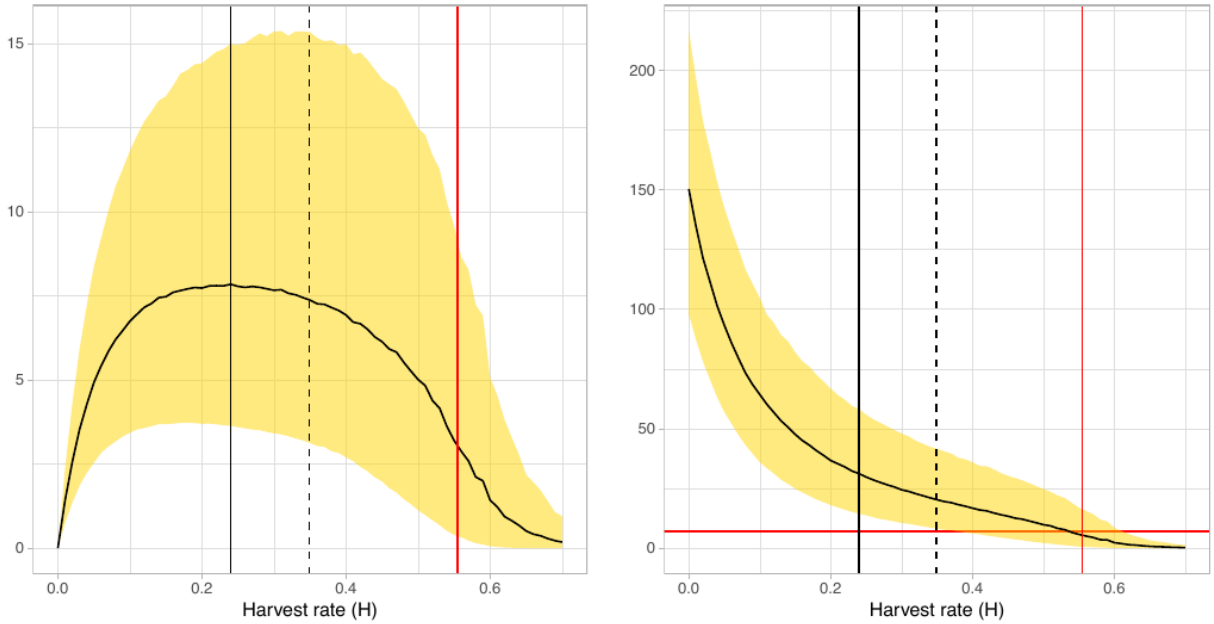

Figure 17. Equilibrium catch (left) and SSB (right) curves as a function of harvest rate H, from the WKICEMSE report 2017[36]. The black solid curves indicate the median projected catch and SSB and the shaded yellow region the 5% – 95% percentiles. Vertical lines indicate H_{lim} (red), H_{pa} (dashed) and H_{MSY}. The horizontal red line indicates B_{lim}. The harvest rate in the rule (0.18) is to the left of the H_{MSY} line.

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

34 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/Iceland.2017.09.pdf
35 https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2017/07/03/Aflaregla-fyrir-keilu-og-longu/
36 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/wkicemse_2017.pdf

8.1.1.10. 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 output control by quota regulation. There is an extensive system for monitoring the fishery, by the Directorate that is the executive branch of the management, and the Coast Guard, that does surveillance and control at sea. There is a set of general technical regulations for the fisheries. The quota is set by applying an agreed HCR to biomass estimates obtained by a stock assessment. The assessment is supported by a well-organised system for collection of fisheries data, as well as by a bottom trawl survey.

Evidence:
The primary management method is output control by quota regulation. The quota is set by applying an agreed HCR to biomass estimates obtained by a stock assessment. The quota is distributed on the fishing fleet in an ITQ system. The management of Icelandic ling is entirely by Iceland.

The assessment is supported by a well-organised system for collection of fisheries data, as well as by a bottom trawl survey of the stock, as described in detail in clauses 1.2. The assessment work is done in ICES by the WGDEEP. This group has members from all involved countries, including Iceland. The preparatory work is done by the MFRI. This includes sampling from the fishery, analysis of samples and performing an annual bottom trawl survey. ICES provide advice based on the assessment. This advice is taken up by MFRI that is the formal advisor to the Ministry. The Ministry makes the ultimate decisions on management. It has the authority to deviate from the advice but will only do so if there is strong reasons for that.

Both the Ministry and MFRI have regular consultations with the industry which are further described in supporting rationales for Clauses 1.2.5, 1.5.5 and 3.1.1. In brief there are regular formal and informal communications between scientists, mangers and industry as well as specific consultation groups that allow industry to describe their experiences of the fishing year in the context of past seasons. MFRI also publishes short newsletters regularly providing up-dates on stock analysis and related research outcomes. There appears to now be a general consensus that following the scientific advice and applying the precautionary approach is preferable in the long-term.

There is an extensive system for monitoring the fishery, by the Directorate that is the executive branch of the management, and the Coast Guard, that does surveillance and control at sea. This is further described in Clauses 2.2

While objectives and management measures directed towards ecosystem effects of the herring fishery are not specifically stated in the management plan they are effectively covered elsewhere by both the general technical framework for the fisheries[37] and by specific technical regulations aimed at protecting juvenile herring, and other parts of the ecosystem (e.g. a ban on pelagic trawling within 12nm)[38].

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

37 http://www.althingi.is/lagas/148b/1996057.html
38 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553

8.1.2. Clause 1.2. Research and Assessment

8.1.2.1. 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) 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.

Evidence:

The Marine and Freshwater Research Institute (MFRI)[39] 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[40] and its remit was recently changed to include inland waters. 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's 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.

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 further described in Clause 1.2.2.

MFRI has wide international cooperation in all major fields of marine science, as indicated by its publication record[41]. MFRI participates in providing annual stock assessment and international advice by ICES, which for the ling is done by the ICES Working Group on the Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP). MFRI issues advice on individual stocks on the web once it is ready[42]. 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[43].

References:	See footnotes.

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

39 www.hafro.is, www.hafogvatn.is/en
40 www.althingi.is/lagas/148a/2015112.html
41 http://www.hafro.is/undir_eng.php?ID=20&REF=3
42 https://www.hafogvatn.is/en/harvesting-advice
43 http://www.ices.dk/publications/library/Pages/default.aspx

8.1.2.2. 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 Icelandic ling stock is assessed by ICES WGDEEP using data provided by MFRI. The main data are catch statistics, including catch in numbers by length and age, life history data from the fisheries, and survey abundance measurements. All catches of ling (as well as all other commercial fish) have to be landed in authorized ports and weighed by authorized weighers. These landings are reported to the Directorate and are the primary source of catch data. Landings are assumed to be equal to catches as discards is prohibited and probably small. The survey is the bottom trawl survey in the spring, which is used for a wide range of species. Log-books are compulsory and provide supplementary information but are not used directly for catch statistics. Biological samples from the catch are analysed by MFRI. The information from the samples is used along with the total landings data to estimate catch-in-weight, catch-at-age and length in numbers, weight-at-age-in-the-catch, and length composition in the catch. The assessment is done with the Gadget assessment tool. The quality of the assessment is regarded as satisfactory. There is some retrospective error, but generally within the confidence intervals. Since most detailed information covers only the most recent years, the retrospective error is more prominent than usual also in the past.

Evidence:

The Icelandic ling stock is assessed by ICES (WGDEEP)[44] using data provided by MFRI. The main data are catch statistics, including catch in numbers by length and age, life history data from the fisheries, and stock abundance measurement by a bottom trawl survey in the spring.

The fishery for ling is conducted mostly with long line (65%), mostly at depths less than 300 m (Figure 18), and trawl (20%), mostly at depths less than 500 meters. The area of distribution of the fishery (Figure 18) largely reflects the distribution of the stock as seen in the spring survey.

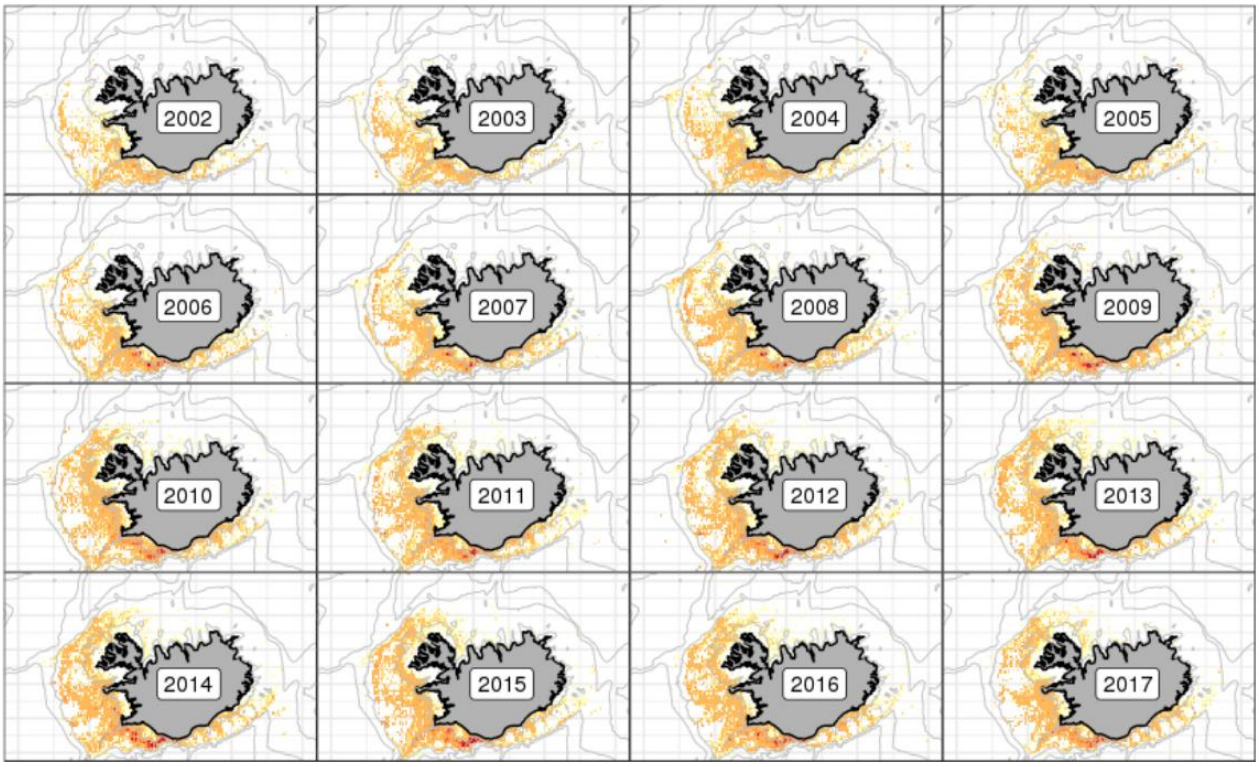

Figure 18. Distribution of catches (mt/square mile) of ling by long-line, according to log-books.

44 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGDEEP/05%20WGDEEP%20Report%20-%20Sec%2004%20Ling%20(Molva%20molva)%20in%20the%20Northeast%20Atlantic.pdf; Section 4.4

All catches of ling has to be landed in authorized ports and weighed by authorized weighers[45] These landings are reported to the Directorate and are the primary source of catch data. Landings are assumed to be equal to catches as discards is prohibited. Studies by MRI indicate that discards of ling are very small (<1% by number, <0.5% by weight)[46]. Log-books are compulsory and provide supplementary information, but are not used directly for catch statistics.

Biological samples from the catch are taken at sea by the fishermen or in the harbours by people from MFRI and/or inspectors from the Directorate of Fisheries. The samples are analysed by MFRI. The general process of the sampling strategy is to take one sample of ling, each consisting of 150 fish, for every 180 t landed; this means that between 30–40 samples are taken from the commercial longline catch each year. Otoliths are extracted from 50 fish which are also length measured and weighed gutted. In most cases ling are landed gutted so it not possible to determine sex and maturity, but if a sample is ungutted, sex and maturity is recorded. The information from the samples is then used along with the total landings data to estimate catch-in-weight, catch-at-age-in numbers, weight-at-age-in-the-catch, and length composition in the catch.

The other source of information in the assessment is results of a bottom trawl survey, which has been ongoing annually since 1985. There are two major bottom trawl surveys, in the spring and in the autumn. Only the spring surveys is used for assessing ling, as the coverage of this survey is the most suitable. The general trends are similar in both surveys. The ridge from Iceland towards the Faroes was only surveyed regularly and included in the surveys index from 2011 onwards. The stations in the spring survey is shown in Figure 19. An extensive survey protocol is available[47].

The assessment is done with the Gadget assessment tool. This is a statistical catch at length and age procedure that fits a modelled population to catch and survey data by length and age. These data are all readily available from the Icelandic sampling programme. The method can use numbers at length as the main source of information, while the age disaggregated data are used as a supplement. This provides an opportunity to assess even stocks with no or sparse data at age. Ling (and several other Icelandic stocks where ageing has been problematic, like tusk, wolffish and golden redfish) are typical representatives of stocks with that data problem. For ling, some samples with age data are now available for all years since 2001, except from some quarters in 2002 and 2003. The assessment method was approved at a benchmark 2014, and again after some revisions in 2017[48]

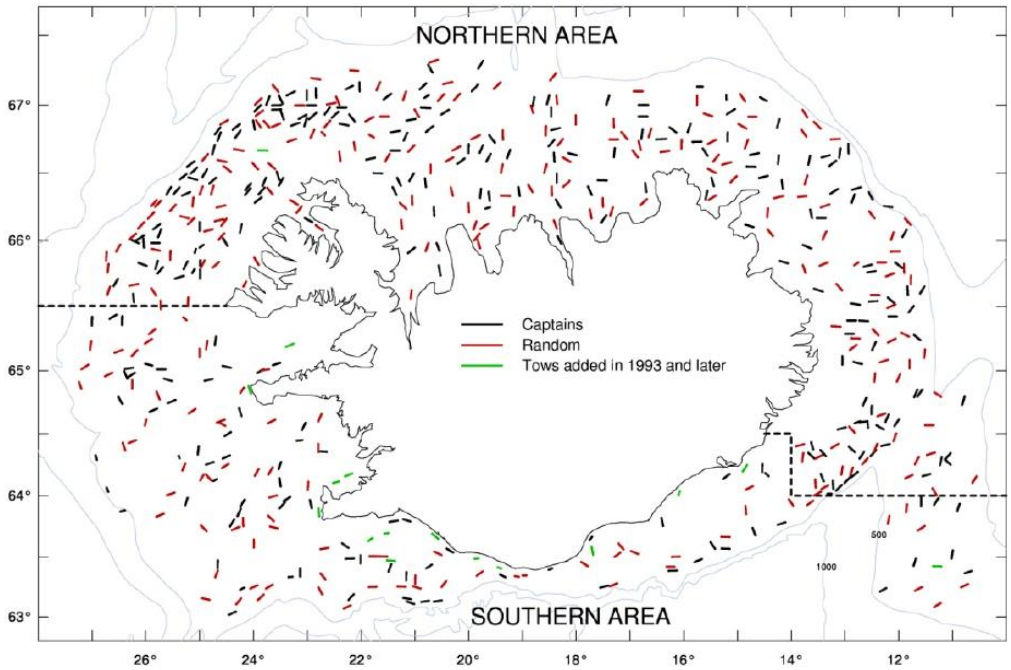

Figure 19. Trawl stations in the spring bottom trawl survey.

45 https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/3842

46 Thordarson, G. (2011) Estimates of tusk and ling discards in the Icelandic longline fishery. WGDEEP-2011:WD02: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2011/WGDEEP/wgdeep_Annex02_WorkingDocuments_2011.pdf; pages 10-18

47 https://www.hafogvatn.is/is/midlun/utgafa/fjolrit-1952-1956-1972-2016/manuals-for-the-icelandic-bottom-trawl-surveys-in-spring-and-autumn-enskar-utgafur-handboka-stofnmaelinga-med-botnvorpu-ad-vori-og-hausti

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

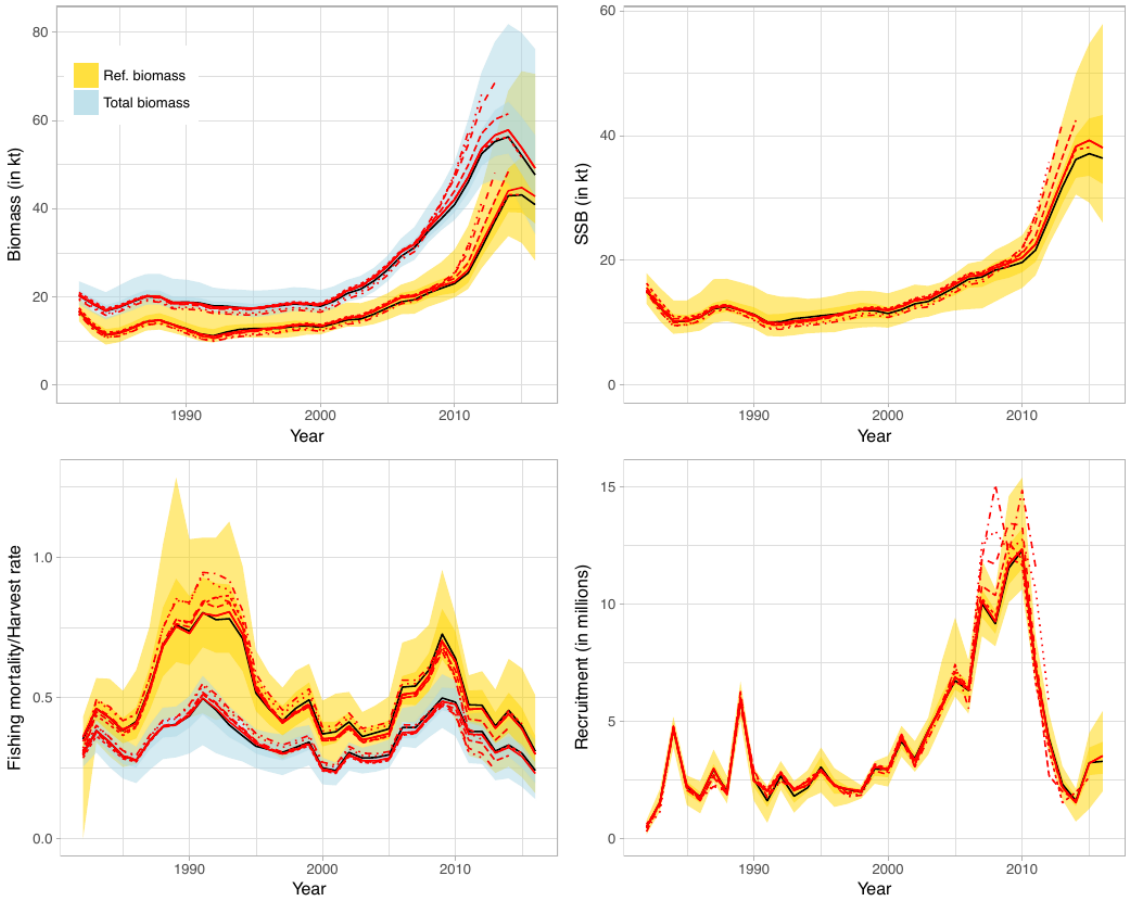

Figure 20. Analytic retrospective assessment error. From the Benchmark report.

The quality of the assessment is regarded as satisfactory. There is some retrospective error, but generally within the confidence intervals (Figure 20). Since most detailed information covers only the most recent years, the retrospective error is more prominent than usual also in the past.

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

8.1.2.3. 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: **Estimates of stock size and productivity of the stock is obtained through annual stock assessments. The stock assessment for ling is based on landings data and results of a bottom trawl survey, as well as life history data. There is no clear dependence of recruitment on stock abundance within the range that has been observed. With the current harvest rate, the expected yield is near the maximum and the stock biomass safely above the limit.**				
Evidence: The stock assessment is based on catch data, a bottom trawl survey and natural mortality that is assumed. The assessment reflects the stock abundance needed to cover the reported catches when natural mortality is taken into account, and the trends in abundance according to the survey is reproduced. The handling of these data and their role in the assessment is described in detail in clause 1.2.2.				

There is no clear dependence of recruitment on stock abundance within the range that has been observed (Figure 21). Rather, the recruitment seems to fluctuate independently of SSB, with a large peak in 2005-2010, which led to a marked rise in the SSB. Accordingly, the yield and biomass per recruit is a fair measure of the productivity at the experienced mortality levels. The yield per recruit curve (Figure 22) is very flat-topped with a maximum around a harvest rate of 0.24. The selected harvest rate of 0.18 is on the low side of the maximum, which implies a very slight loss of median catch but a larger SSB, which reduces the risk of SSB approaching the limit.

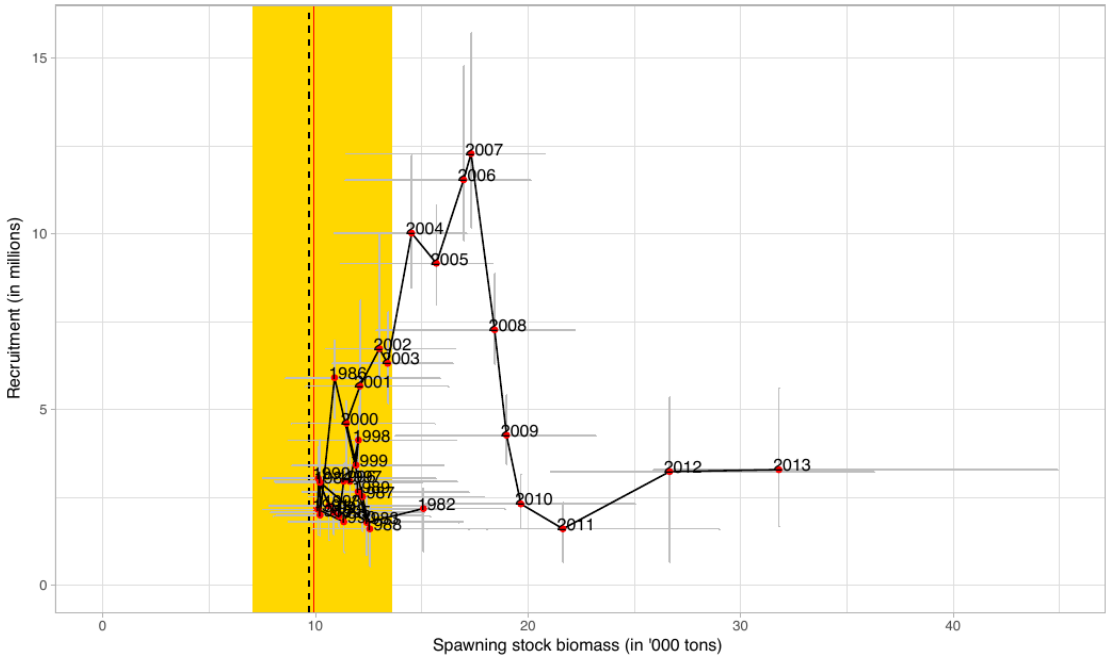

Figure 21. Spawning stock biomass recruitment relationship for ling in 5a. Uncertainty in recruitment and SSB is indicated with 95% quantile intervals. The yellow vertical bar represents the distribution of B_{loss}.

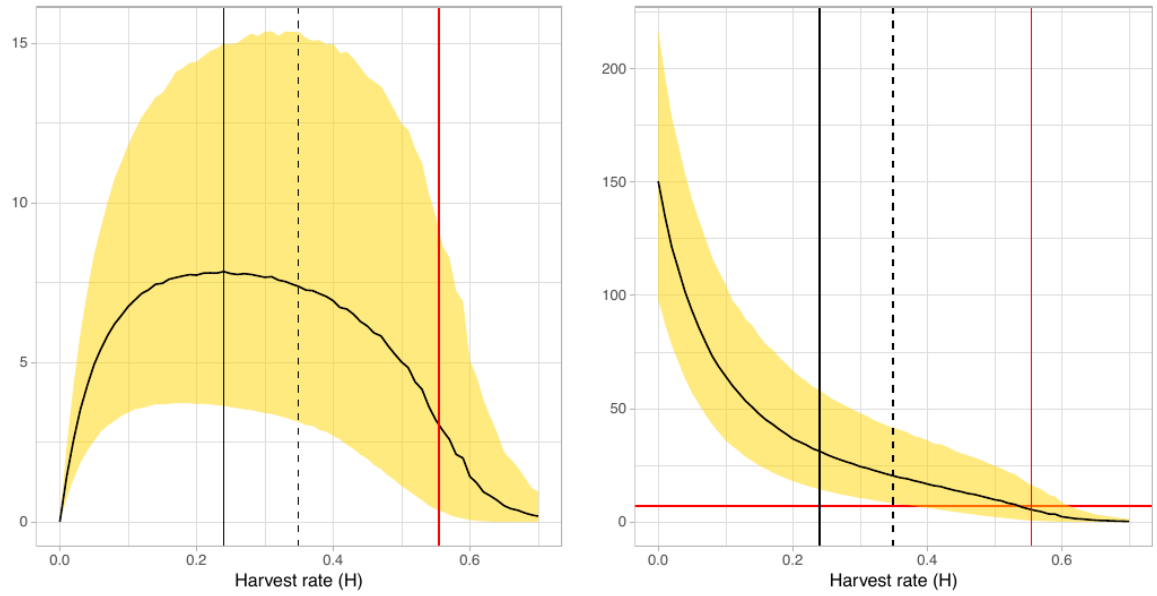

Figure 22. Equilibrium catch (left) and SSB (right) curves as a function of harvest rate H, from the WKICEMSE report 2017[49]. A hockey-stick stock-recruit function is applied, assuming that the recruitment is reduced linearly towards the origin at SSB < Blim. The black solid curves indicate the median projected catch and SSB and the shaded yellow region the 5% – 95% percentiles. Vertical lines indicate H_{lim} (red), H_{pa} (dashed) and H_{MSY}. The horizontal red line indicates B_{lim}. The harvest rate in the rule (0.18) is to the left of the H_{MSY} line at 0.24.

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

Weight at age is only modelled with fixed parameters. Hence, density dependence cannot be inferred from the assessment results and observed weights at age are not available.	
References:	See footnotes.
Non-Conformance Number (if relevant)	**NA**

8.1.2.4. 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: **Discarding is illegal and studies by MRI indicate that discards that discards of ling are very small (<1% by number, <0.5% by weight). Other sources of unobserved and incidental mortality are not known. Misreporting of catches and fishing in closed areas or without quotas is not likely. There is extensive monitoring of the fishery by the Coast Guard and Directorate. Local knowledge and small communities contribute to transparency in fishing operations and makes it difficult to conceal misbehaving.**				
Evidence: The assessment is based on reported catches and assumed natural mortality. With the applied method, fishing mortality is calculated by fitting model results to observed catches and survey indices at length and age and an assumed natural mortality. Discarding is illegal and studies by MRI indicate that discards that discards of ling are very small (<1% by number, <0.5% by weight)[50]. Other sources of unobserved and incidental mortality are not known. Misreporting of catches and fishing in closed areas or without quotas is not likely. There is extensive monitoring of the fishery by the Coast Guard and Directorate. If the Coast Guard discovers suspicious behaviour, it will first of all contact the vessel, and if needed, vessels in the neighbourhood, primarily to ensure that the vessel is not in danger. If violations of the rules are discovered, appropriate action is taken. The Coast Guard does regular inspections, partly directed towards vessels that are suspected of irregularities. In addition to direct surveillance, local knowledge and small communities contribute to transparency in fishing operations and makes it difficult to conceal misbehaving.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.2.5. 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.**				

50 Thordarson, G. (2011) Estimates of tusk and ling discards in the Icelandic longline fishery. WGDEEP-2011:WD02: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2011/WGDEEP/wgdeep_Annex02_WorkingDocuments_2011.pdf; pages 10-18.

Evidence: There is close communication between scientists and the fishing industry, both in formal meetings and through informal contact. There are specific consultation groups 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.	
References:	
Non-Conformance Number (if relevant)	**NA**

8.1.2.6. 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 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.**				
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 ling. • 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 MRI clearly shows broad international cooperation on published scientific work.[51] 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. 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)[52]				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.2.7. 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: **The stock unit as defined by ICES includes only Iceland.**				

51 http://www.hafro.is/undir_eng.php?ID=20&REF=3 (not updated since 2015)
52 http://www.fiskistofa.is/english/international-cooperation/

Evidence: The stock unit as presently defined by ICES includes only Iceland. The stock structure is poorly known, but substantial migrations between the main areas of occurrence is regarded as quite unlikely[53]. More recent genetic studies support the perception of Icelandic ling as a separate management unit[54].	
References:	See footnotes.
Non-Conformance Number (if relevant)	**NA**

53 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2007/WGDEEP/Sec-04-%20Stock%20Identity.pdf

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

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

8.1.3.1. Clause 1.3.1. The Precautionary Approach

8.1.3.1.1. Clause 1.3.1.1.

The precautionary approach[55] 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. It has been tested and found precautionary by ICES.**				
Evidence: 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. The precautionary management of Icelandic ling is further detailed in the clauses below.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.3.1.2. Clause 1.3.1.2.

The stock under consideration shall not be overfished to a level causing recruitment overfishing[56].

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **There is a limit biomass reference point above which there is no indication of recruitment failure. Recruitment has fluctuated over the years, but apparently independently spawning biomass. The harvest rule implies a low risk of reaching that biomass.**				
Evidence: There is a limit biomass reference point above which there is no indication of recruitment failure (see Clause 1.3.1.4). Recruitment has fluctuated over the years, but apparently independently spawning biomass. There is a harvest rule with a harvest rate = 0.18, which is reduced if SSB < 9930 t, which is 1.4 times the limit SSB. Simulations have demonstrated a low risk of bringing SSB below the limit with the harvest rule.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.3.1.3. 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 method of risk assessment is stochastic simulations of the harvest rule, by which the risk to unwanted stock development is quantified. This is standard procedure in such evaluations.**				
Evidence:				

55 Referring to clause 29.6 of the FAO Eco-labelling Guidelines for Fish and Fishery Products from Marine Capture Fisheries
56 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.

The method of risk assessment is stochastic simulations of the harvest rule, by which the risk to unwanted stock development is quantified. This is standard procedure in such evaluations.	
References:	
Non-Conformance Number (if relevant)	**NA**

8.1.3.1.4. 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[57].

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

Summary Evidence:

Precautionary and MSY reference points have been defined by ICES and adopted by MFRI in their advice. As part of the harvest rule a trigger biomass has been defined below which the harvest rate is reduced. Other actions to be taken if reference points are approached or exceeded have not been specified.

Evidence:

A full set of reference points was defined by ICES together with the evaluation of the current harvest rule and revision of the assessment by WKICEMSE in 2017[58]. There is no indication of recruitment failure in the brief history, and no clear dependence of recruitment on SSB (Figure 23 and Figure 24). However, the range of SSB in the assessed history is narrow, apart from a rise since about 2012 after a period with very high recruitment around 2010.

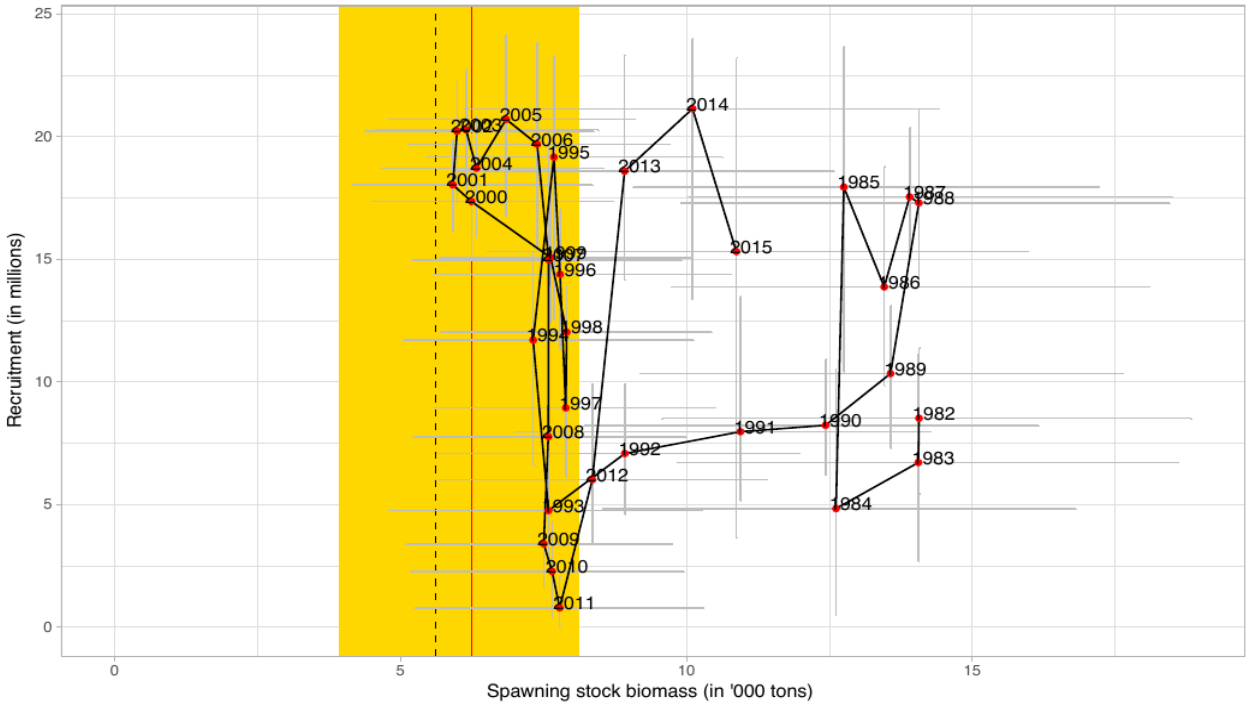

Figure 23. Spawning stock biomass recruitment relationship for ling in 5a. Uncertainty in recruitment and SSB is indicated with 90% quantile intervals as grey bars. Red point indicate the median estimate and black solid line the chronological order. The yellow vertical bar represents the distribution of B_{loss}.

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

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

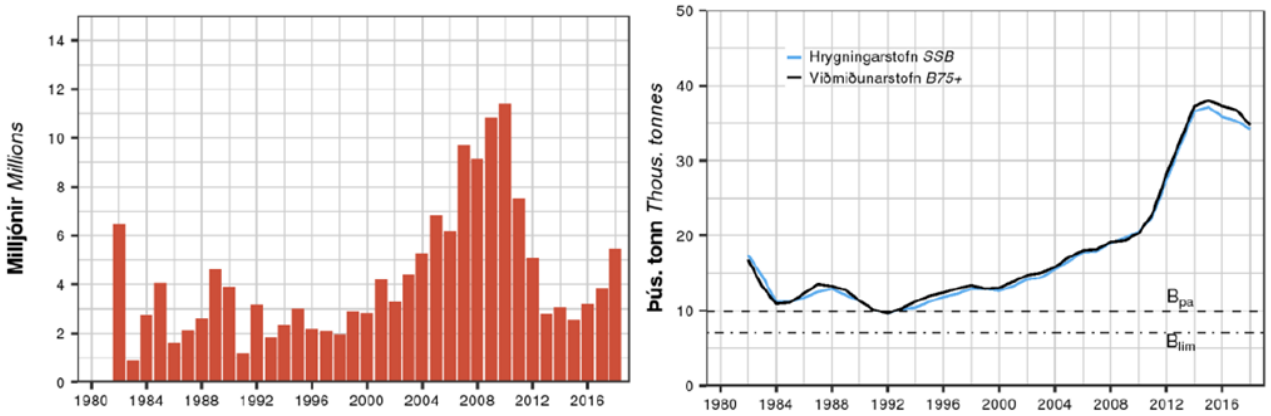

Figure 24. Time series of recruitment (Age 3) (millions) (left) and biomass (thousand tonnes) (right).

The harvest rate, and implicitly the fishing mortality, has been moderate in most of this period, except for a peak around 1990 and one around 2008 - 2010. (Figure 25). With a narrow range of SSB historically and a moderate exploitation, setting B_{lim} at the lowest observed SSB (B_{loss}) would be unduly restrictive. Following ICES guidelines for this situation, the lowest observed SSB (9,930 t) was used for B_{pa}, and B_{lim} was derived based on the inverse of the standard factor used for calculating Bpa from B_{lim}, i.e. B_{lim} = 9,930/1.4 = 7,090 t.

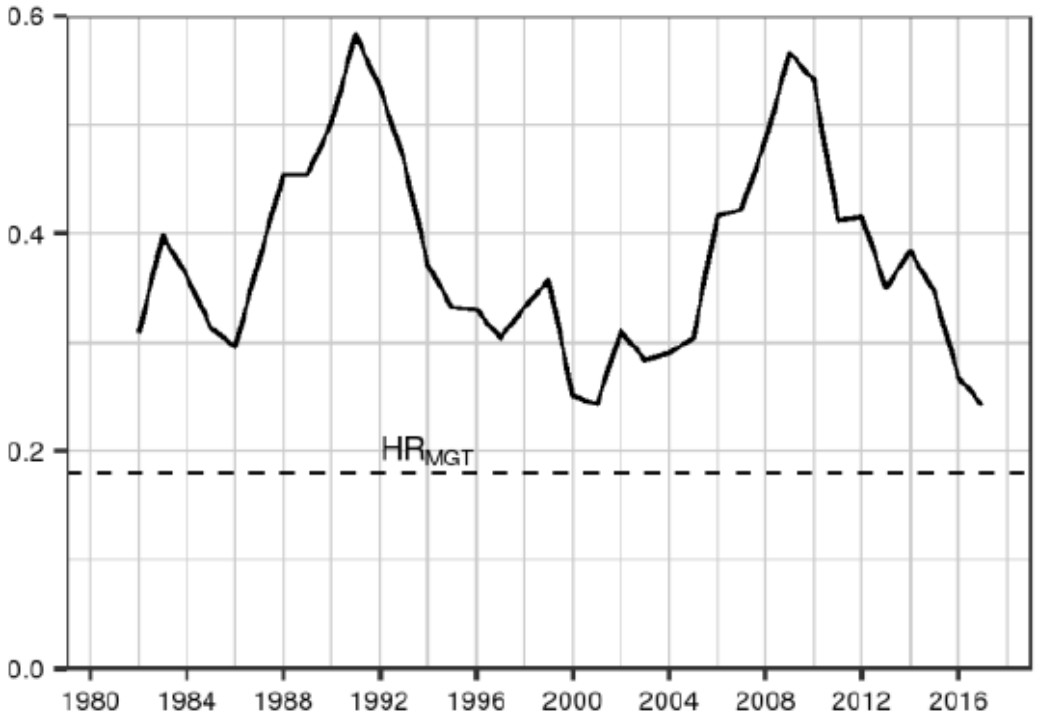

Figure 25. Time course of harvest rate. The harvest rate (=0.18) in the agreed harvest rule is marked.

The current harvest rule was tested by simulations to ensure a low (<5%) probability that it would lead SSB below B_{lim}. The testing tool was a forward projecting bootstrap procedure, without assessment feedback but taking into account uncertainty in process, in particular in recruitment, and assessment uncertainty, both including autocorrelations. No implementation error was assumed. This tool has been used for several Icelandic stocks, first for cod in 2009.

According to these simulations, the harvest rate leading to maximum long term yield (H_{MSY}) is 0 .24 and the harvest rate with 50% probability of SSB < B_{lim} is 0.56, corresponding to a F_{lim} = 0.70. For the harvest rule, a harvest rate = 0.18 was decided, which is on the safe side of the HMSY but leading to almost the same long term yield. In-line with ICES technical guidelines the MSY $B_{trigger}$ is set as B_{pa}, as the stock has not been managed according to F_{MSY}, or equivalents thereof, for more than 5 years. The rule is to reduce the HR linearly towards the origin for SSB below $B_{trigger}$.

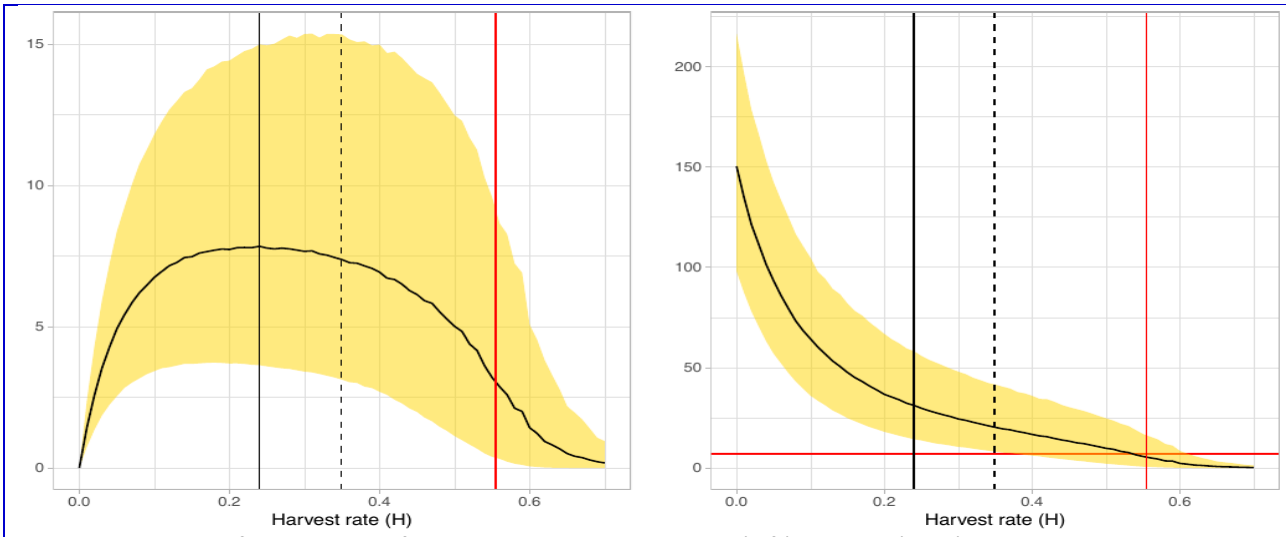

Figure 26. Results of simulations of harvest rule. Long term yield (left) and SSB (right). The vertical black line is the harvest rate corresponding to MSY. The decided harvest rate for the rule (=0.18) is to the left of the MSY. The red line corresponds to the limit harvest rate, leading to B_{lim} with 50% probability.

The whole set of precautionary and MSY reference points, as proposed by WKICEMSE and adopted by ICES and MFRI is presented in Table 9 below.

Table 9. Precautionary and MSY reference points for ling in 5a, proposed by WKICEMSE and adopted by ICES and MFRI.

Nálgun *Framework*	Gátmörk *Reference point*	Gildi *Value*	Grundvöllur *Basis*
Aflaregla *Management plan*	SSB_{MGT}	9930	B_{pa}
	HR_{MGT}	0.18	Veiðihlutfall af viðmiðunarstofni (B_{75+}), leiðir til langtíma hámarksafraksturs. Vænt gildi veiðihlutfalls, þegar veitt er samkvæmt aflareglu, er milli 0.12 og 0.28. *Percentage of biomass 75+ cm. Leads to long-term MSY. Realized HR can range from 0.12-0.28.*
MSY	MSY-$B_{trigger}$	9930 t	B_{pa}
	HR_{MSY}	0.24	Slembireikningar innan Gadget líkans *Stochastic projections*
	F_{MSY}	0.284	Slembireikningar innan Gadget líkans *Stochastic projections*
Varúðarnálgun *Precautionary approach*	B_{lim}	7090 t	$B_{pa}/1.4$
	B_{pa}	9930 t	B_{loss}
	F_{lim}	0.7	Veiðidánartala sem leiðir til þess að hrygningarstofn er yfir B_{lim} með 50% líkum *Equilibrium F which will maintain the stock above B_{lim} with a 50% probability*
	F_{pa}	0.41	95% líkur á að veiðidánartala sé undir F_{lim} *95% probability that true F is below F_{lim}.*
	HR_{lim}	0.56	Veiðihlutfall sem leiðir til þess að hrygningarstofn er yfir B_{lim} með 50% líkum *Equilibrium HR which will maintain the stock above B_{lim} with a 50% probability*
	HR_{pa}	0.35	95% líkur á að veiðihlutfall sé undir HR_{lim} *95% probability that true HR is below HR_{lim}.*

As part of the harvest rule a $B_{trigger}$ biomass of 9,930 tonnes has been defined below which the harvest rate is reduced. Other remedial actions to be taken if reference points are approached or exceeded have not been specified. This is very unlikely unless something unexpected happens, and if so, the relevant action would depend on the cause.

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

8.1.3.1.5. 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: **In line with the intentions in the basic fisheries law (116/2006), keeping the stock within safe limits, maintaining catches close to the maximum sustainable yield and maintaining stability are cornerstones in Icelandic management policy.**				
Evidence: In a formal statement presented by several responsible parties in the Icelandic fishing industry: The Minister of Fisheries, the Marine and Freshwater Research Institute, the Directorate of Fisheries and the Fisheries Association of Iceland it is stated that in line with the intentions in the basic fisheries law (116/2006), keeping the stock within safe limits, maintaining catches close to the maximum sustainable yield and maintaining stability are cornerstones in Icelandic management policy[59], as implemented in the formulation and adoption of the current harvest rule also for ling.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.3.1.6. 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 precautionary approach is implemented by applying a harvest rate in the harvest rule that is low enough to make a decline in SSB below the limit very unlikely.**				
Evidence: The precautionary approach is implemented by applying a harvest rate in the harvest rule that is low enough to make a decline in SSB below the limit very unlikely. The limit is set to represent a biomass above which recruitment failure is unlikely. Accordingly, recruitment failure due to low stock biomass should not occur unless the productivity of the stock changes in an unexpected way.				
References:				
Non-Conformance Number (if relevant)				**NA**

59 https://www.responsiblefisheries.is/seafood-industry/management-and-control-system/statement-on-responsible-fisheries/

8.1.3.2. Clause 1.3.2. Management targets and limits

8.1.3.2.1. Clause 1.3.2.1. Harvesting rate and fishing mortality

8.1.3.2.1.1 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[60].

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **The management target for the fishing mortality is a harvest rate at 0.18, which is a proxy for a target fishing mortality. It shall be reduced if SSB falls below a trigger level of 9,930 mt. ICES has defined a limit harvest rate (=0.56) which corresponds to more than 3 times the target harvest rate.**				
Evidence: The management target for the fishing mortality is a harvest rate (fraction of Biomass of 75 cm+) at 0.18, which is a proxy for a target fishing mortality. According to the rule, the HR shall be reduced linearly towards the origin if SSB in the assessment year is estimated below B_{pa} = 9,930 mt. A limit fishing mortality has been set at 0.70. That corresponds to a harvest rate of 0.56 which is more than three times the harvest rate in the harvest rule.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.3.2.1.2 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[61].

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **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: There are no measures planned for the event that fishing mortality shall exceed the F 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 ling management. The government has the authority to do so.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

60 Flim can be explicit or implicit in cases where harvest rate is set annually to a precautionary Ftarget (or its proxy)

61 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.

8.1.3.2.2. Clause 1.3.2.2. Stock Biomass

8.1.3.2.2.1 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: **A long-term target for the stock size is considered redundant and not defined.**				
Evidence: A long-term target for the stock size is not defined. It is considered redundant as the management target is to maintain a harvest rate expected to lead to a biomass fluctuating safely above the precautionary biomass limit. The target harvest rate has been demonstrated to provide a long term yield close to the MSY; the loss in expected yield by applying a harvest rate of 0.18 rather than the MSY harvest rate of 0.24 is only ≈2%.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.3.2.2.2 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: **A precautionary limit biomass has been defined as SSB = 7,090 mt, above which there is no indications of impaired recruitment**				
Evidence: A precautionary limit biomass has been defined as SSB = 7,090 mt, and a trigger point in the harvest rule as SSB = 9,930 mt. The trigger value is the lowest SSB observed, and there has been no 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 Clause 1.3.1.4.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.3.2.2.3 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: **The procedure applied when setting reference points follows ICES standards and the results were accepted by ICES.**				
Evidence: The background for B_{lim} is described in detail in Clause 1.3.1.4. This procedure follows ICES standards and the result was accepted by ICES.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.3.2.2.4 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: **If SSB falls below the trigger at 9,930 mt, the harvest rate according to the rule is reduced linearly towards the origin**				
Evidence: If SSB falls below the trigger point at 9,930 mt, the harvest rate according to the rule is reduced linearly towards the origin. According to the simulations done when evaluating the harvest rule, approaching B_{lim} 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:				
Non-Conformance Number (if relevant)				**NA**

8.1.3.2.3. 1.3.2.3. Stock biology and life-cycle (structure and resilience)

8.1.3.2.3.1 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[62].

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **The harvest rule was designed to provide a near maximum long term yield and a stock abundance safely away from the limit. The target harvest rate is set on the low side of the plateau associated with maximum yield, which provides a buffer biomass against natural variations in productivity**				
Evidence: The harvest rule was designed to provide a near maximum long term yield and a stock abundance safely away from the limit. The target harvest rate is set on the low side of the plateau associated with maximum yield, which provides a buffer biomass against natural variations in productivity, and ensures near maximum yield with a minimum fishing pressure. The loss in expected yield by applying a harvest rate of 0.18 rather than the MSY harvest rate of 0.24 is only about 2%. This lower harvest rate also promotes stability as the stock gets a broader age composition which makes it less sensitive to fluctuating recruitment.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.3.2.3.2 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})[63].

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

62 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.

63 FAO Guidelines (2009), par. 30.3.

There are no specific measures to protect spawning fish. Stock structure is largely unknown, but some concern has been expressed that local components may become depleted if the fishery is concentrated in limited areas.	
Evidence: There are no specific measures at present to protect spawning ling The stock structure of ling is largely unknown. That includes spawning grounds and nursery areas. Ling is mostly found in the deeper waters south and west off Iceland, where it probably also spawns and grows up. Genetically, ling in the North-East Atlantic is not a homogeneous stock, and mixing seems to be weak between components.	
References:	See footnotes.
Non-Conformance Number (if relevant)	**NA**

8.1.3.2.3.3 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:
Some areas are permanently closed to protect juvenile tusk, which potentially may be beneficial for ling as well.

Evidence:
There are no specific measures to protect juvenile ling. At 60 cm around 10% of ling in 5.a is mature, at 75 cm 50% of ling is mature and at 100 cm more or less every ling is mature. Mean length in catch is around 80 cm which according to available ageing means that it is approximately eight years old. Estimates of selectivity (Figure 27) indicate that the fishery is not directed towards juveniles meaning small ling do not appear in catches.

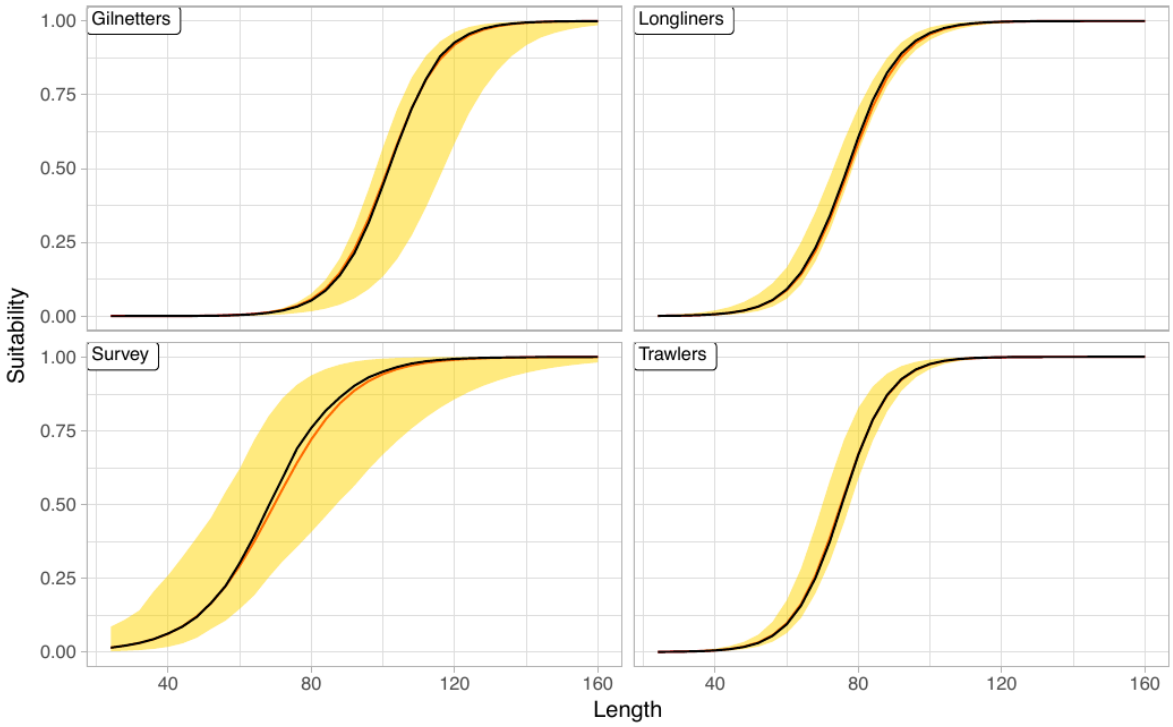

Figure 27. Bootstrap estimates of selection curves from the fleets in the Gadget model. Black lines is the median and shaded area the 5% – 95% interquantile range.

While there are no specific measures to protect juvenile ling, the provision exists for short term closures to invoked if there were too much small ling in catches.

References:	

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

8.1.4. Clause 1.4. External Scientific Review

8.1.4.1. 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: **ICES is considered to be the appropriate international scientific body. The annual stock assessments and short term predictions are performed by the ICES WGDEEP, and reviewed routinely as part of the ICES advisory process. ICES also performs in-depth review of assessment methods (benchmarks) and evaluation of harvest rules. For ling, this was done in 2017 where the present assessment and rule were approved.**				
Evidence: ICES[64] is considered to be the appropriate international scientific body. The annual stock assessments and short term predictions are performed by the ICES WGDEEP, and reviewed routinely as part of the ICES advisory process. This is done according to the Memorandum of Understanding between ICES and NEAFC. ICES has developed routines for more in-depth review of assessment methods and data that go into the assessment (benchmark assessments). Ideally, this should be done approximately every 5 years, or if there are reasons to alter the assessment practices. Iceland ling was benchmarked in 2017[65] in conjunction with the evaluation of the management plan. Here, the assessment method with the Gadget tool was approved after some amendment. There is no formal revision clause in the ling management plan. Normal practice would be to review the rule about every 5 years, or if the assumptions made when evaluating the rule do not hold any more.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.4.2. 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: **The harvest rule development was requested by the Ministry and done by MFRI. Their proposal was presented to ICES and endorsed after a review process there. The final result was then adopted by the Ministry.**				
Evidence: The harvest rule development was requested by the Ministry and done by MFRI. Their proposal was presented to ICES and endorsed after a review process there. The final result was then adopted by the Ministry[66].				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

64 http://www.ices.dk
65 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/wkicemse_2017.pdf
66 https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2017/07/03/Aflaregla-fyrir-keilu-og-longu/

8.1.5. Clause 1.5. Advice and Decisions on TAC

8.1.5.1. 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: **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: The stock assessment and advice for the TAC in the coming year is provided annually by ICES. 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, but it can deviate if there is good reasons for that. ICES advice is published on the ICES website and MFRI advice is published on the MFRI website when ready.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.5.2. 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 and ICES has reference points tabulated:**				

Evidence:

Advice published by the MFRI[67] has reference points tabulated (Table 10). These are identical to those defined by ICES and include the reference values in the harvest rule in the management plan.

Table 10. Reference points for ling in 5a, included in the latest scientific advice.

Framework	Reference point	Value	Basis
Management plan	SSB_{MGT}	9,930 mt	B_{pa}
	HR_{MGT}	0.18	Percentage of biomass 75+ cm. Leads to long-term MSY. Realized HR can range from 0.12-0.28.
MSY	MSY-$B_{trigger}$	9,930 mt	B_{pa}
	HR_{MSY}	0.24	Stochastic projections
	F_{MSY}	0.284	Stochastic projections
Precautionary approach	B_{lim}	7,090	$B_{pa}/1.4$
	B_{pa}	9,930	B_{loss}
	F_{lim}	0.7	Equilibrium F with a 50% probability of maintaining the stock above B_{lim}.
	F_{pa}	0.41	95% probability that true F is below F_{lim}.
	HR_{lim}	0.56	Equilibrium HR with a 50% probability of maintaining the stock above B_{lim}
	HR_{pa}	0.35	95% probability that true HR is below HR_{lim}.

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

67 Advice published June 2018: https://www.hafogvatn.is/static/extras/images/Langa_2018729172.pdf

8.1.5.3. 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: **Ling in Icelandic waters is regarded as a domestic stock, and the Icelandic Ministry is the competent authority.**				
Evidence: Ling in Icelandic waters is regarded as a domestic stock with the Icelandic Ministry being the competent authority.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.5.4. 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: **Iceland manages ling in Icelandic waters as a domestic stock. There is general cooperation within e.g. ICES and NEAFC, but no specific cooperation for ling.**				
Evidence: Iceland manages ling in Icelandic waters as a domestic stock. There is general cooperation within e.g. ICES and NEAFC, but no specific cooperation for ling.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.5.5. 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: **The TAC for the fishing year 2017/2018 and 2018/2019 was set by the Ministry according to the new HCR.**				
Evidence: 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 is 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. The TAC for ling for 2017/2018 and 2018/2019 were set according to the new harvest rule.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.5.6. 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: **Laws and regulations for conservation and sustainable use of the fish stocks around Iceland are valid also for ling.**				
Evidence: As discussed in more detail in Clause 1.1.7 - 1.1.10, there is no explicit document covering all aspects of the management plan for ling. Rather, the management of ling is part of the general fisheries management, stated in the suite of rules and regulations applicable to all commercial fisheries in Iceland. A harvest rule has been developed for ling, which states how the TAC is calculated based on stock abundance estimated in an analytic stock assessment. So far, the decision to apply the rule has been advertised in the Ministries web-pages.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.1.5.7. 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: **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 that is responsible for surveillance and enforcement at sea and the MFRI which performs assessments and provides advice.**				
Evidence: 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:				
Non-Conformance Number (if relevant)				**NA**

8.1.5.8. 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. These include a landings obligation, catch reporting by independent, authorized personnel, and close monitoring of activities at sea. However, legal transfers of quotas between species and years may lead to catches deviating from TACs; historically, catches have deviated from the TAC in both directions.**				
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. Apparently, discards of ling is a minor problem, but the control is sparse.				

- 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 may be 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. It may happen that vessels spend part of the ling quota on other species that are more valuable.
- Quotas agreed with other nations (Faroes and Norway) are for demersal species in general. The ling caught under these arrangements is subtracted before the national quota is set, but the amount can only be assumed.
- Catches that should 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.

Table 11 and Figure 28 below show the recent historical record of adherence to the quotas, according to the MFRI advice. The deviations go in both directions.

Table 11. Ling recommended TAC, national TAC and catches (mt) (2010/2011 – 2018/2019).

Fiskveiðiár *Fishing year*	Tillaga *Rec. TAC*	Aflamark *National TAC*	Afli Íslendinga *Catches Iceland*	Afli annarra þjóða *Catches other*	Afli alls *Total catch*
2010/11	7500	7500	9327	768	10095
2011/12	8800	9000	10074	1059	11133
2012/13	12000	11500	11196	1249	12445
2013/14	14000	13500	11717	1683	13400
2014/15	14300	13800	11112	1311	12423
2015/16	16200	15000	9773	1456	11229
2016/17	9343	8143	7291	1135	8426
2017/18	8598[1)]	7598			
2018/19	6255[1)]				

[1)] 18% aflaregla. *18% harvest control rule*

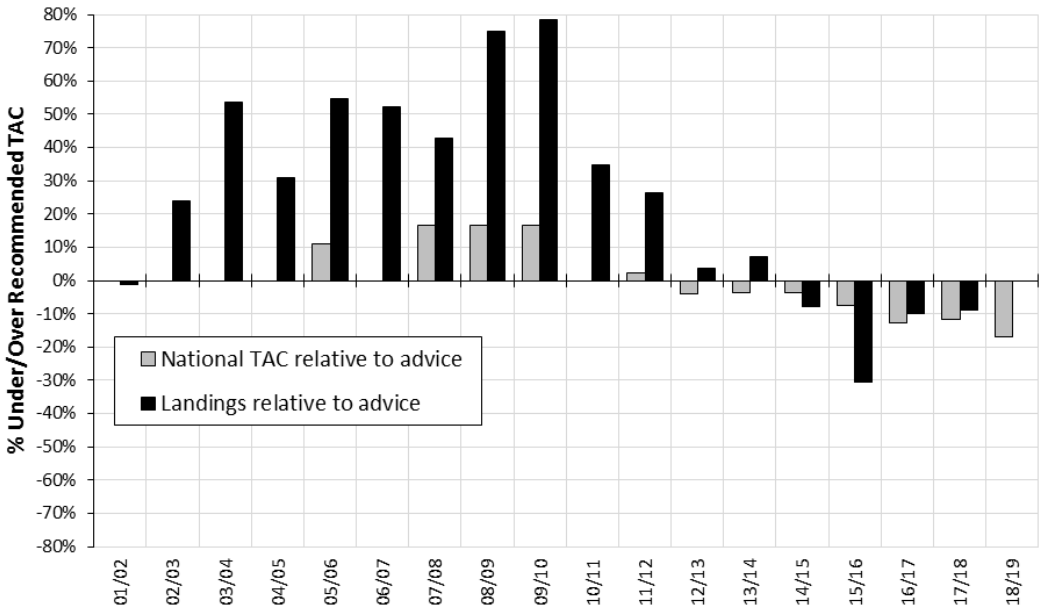

Figure 28. Catch and national TAC relative to advice in the fishing years (2001/2002 – 2018/2019).

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

8.1.5.9. 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. Ling in Icelandic waters is not a shared stock.**				
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. The advice is taken over by local authorities. In Iceland, the Ministry is advised by the MFRI, based on the ICES advice. Other nations (Faroes and Norway) have quotas for ling in Icelandic waters, by mutual agreements. Only recently, Icelandic authorities have taken those quotas into account when setting Icelandic quotas. The general legal basis that applies to all Icelandic fish stocks also apply to ling. 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. Iceland participates in fisheries and non-fisheries organisations/arrangements in the North Atlantic region such as: ▪ The North East Atlantic Fisheries Commission (NEAFC[68]) ▪ The Northwest Atlantic Fisheries Organisation (NAFO[69]) ▪ The International Council for the Exploration of the Sea (ICES[70]) ▪ The North Atlantic Marine Mammal Commission (NAMMCO[71]) Some of Iceland´s commercially important fish stocks 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. Ling is not regarded as a shared stock.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.1.5.10. 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[72].

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **Stock abundance is estimated by a full analytic assessment. Accordingly, using generic evidence is not necessary.**				
Evidence: Stock abundance is estimated by a full analytic assessment. Accordingly, using generic evidence is not necessary.				
References:				
Non-Conformance Number (if relevant)				**NA**

68 http://www.neafc.org/
69 http://www.nafo.int/
70 http://www.ices.dk/Pages/default.aspx
71 http://www.nammco.no/
72 FAO Guidelines (2009), para. 30.4.

8.2. Section 2: Compliance and Monitoring

8.2.1. Clause 2.1. Implementation, Compliance, Monitoring, Surveillance and Control

8.2.1.1. 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[73].

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). Together these provide the legal basis for the Icelandic 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 a number of 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.

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)[74], 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. 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 (see Icelandic Redfish FMP[75]), Port Authorities and the MFRI.

The Directorate has 61 staff (2017) 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 (Figure 29).

73 2005 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.

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

75 https://www.government.is/news/article/?newsid=e747dac7-fb88-11e7-9423-005056bc4d74

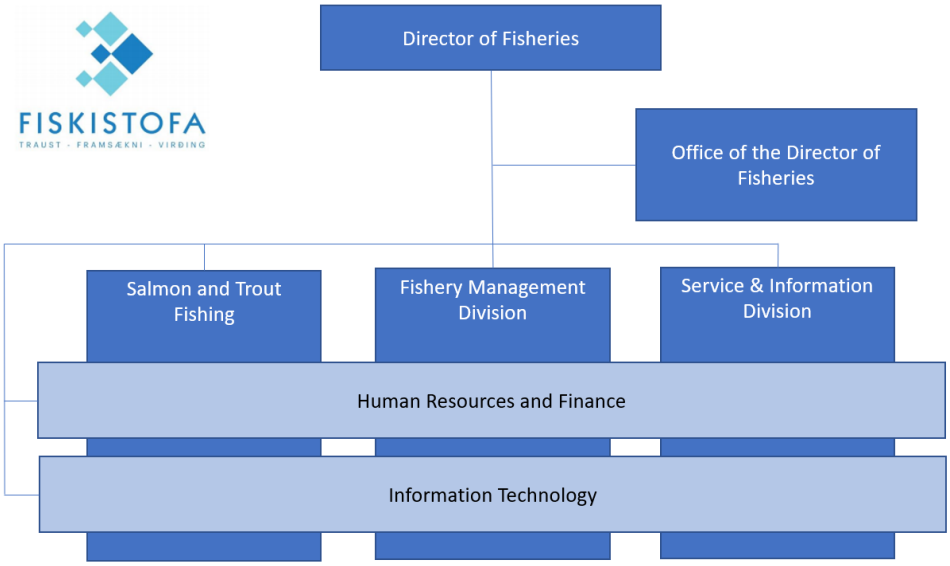

Figure 29. Directorate of Fisheries organisational chart and staff (Source: SAIG, modified from http://www.fiskistofa.is/umfiskistofu/skipurit/).

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[76]. 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. 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 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)[77].

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[78]). Provisions of the Act on a Special Fee for Illegal Marine Catch[79] are also applied as appropriate. Penalties range from the issue of reprimands by the Directorate of Fisheries and the suspension of commercial fishing permits to fines and, in cases of serious or repeated deliberate violation, imprisonment for up to six years (Article 24 and 25 of Act No. 116/2006).
The Act governing fishing activities within the Icelandic EEZ (Act No. 79/1997)[80] specifies the Icelandic EEZ and prohibits foreign vessels from fishing within Iceland's EEZ (unless by prior agreement). It sets out the areas vessels are permitted to fish within the EEZ according to fishing vessel size and power index category (Article 5 of Act No. 79/1997). 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.

[76] https://www.althingi.is/lagas/149a/2006116.html
[77] https://www.icetra.is/maritime/ships-and-cargoes/
[78] https://www.althingi.is/lagas/149a/1996057.html
[79] https://www.althingi.is/lagas/149a/1992037.html
[80] *extwprlegs1.fao.org/docs/texts/ice89476.doc*

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 (Article 5).

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[81]. 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[82,83] 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.

The scale operator has 10 minutes to enter the info before the system 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 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 vessels 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.

[81] https://www.stjornartidindi.is/Advert.aspx?RecordID=884be309-64a5-4367-9e4d-f5e7216b6f40
[82] https://www.fmis.is/blank
[83] http://www.unuftp.is/static/fellows/document/pan09prf.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. We 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[84].

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%[85] of the quota held for each individual demersal species. However, this authorisation does not apply to 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%[86] of catch quotas for each demersal species 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. 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 or 'VS Fund' (established by Act No. 37/1992), 20% going to the vessel (Article 11, Act No. 116/2006)[87]. 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. Figure 30 below shows the number of boardings undertaken by the Coast Guard since 2005.

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

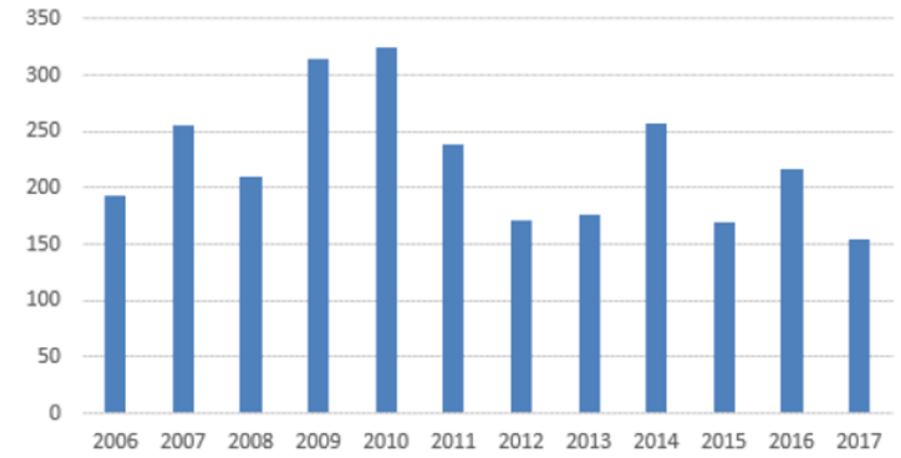

Figure 30. No. of Coast Guard inspections from 2005 (Source: Coast Guard presentation to assessment team, Dec 2018).

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 31).

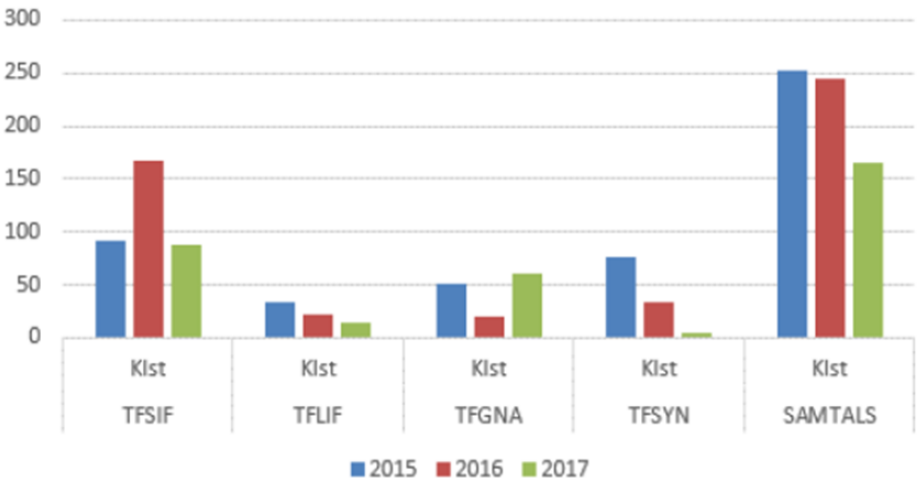

Figure 31. Air surveillance 2015-2017. The final column (Samtals) shows total hours air surveillance flown, whilst the other columns show hours by individual aircraft (Source: Coast Guard presentation to assessment team, Dec 2018).

Days spent by Fisheries Directorate inspectors at sea inspecting vessels as a proportion of total fishing effort is shown in Table 12 below.

Table 12. Directorate 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%

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 (Figure 32).

Most 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.

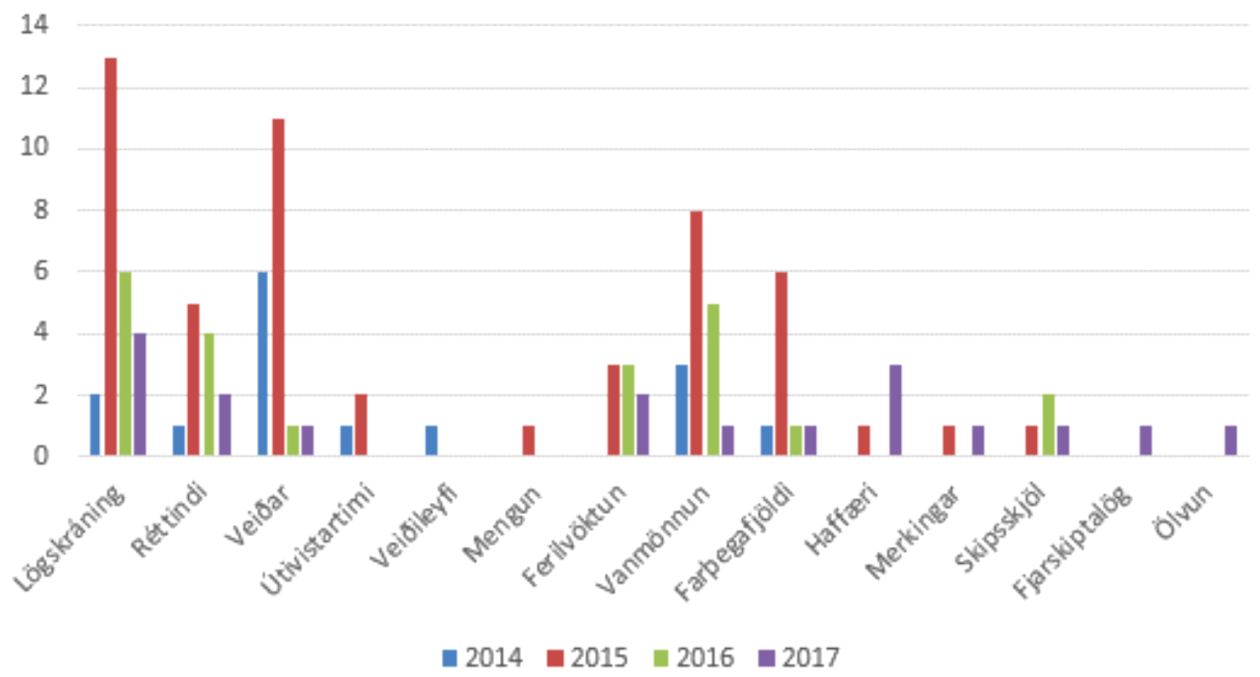

Figure 32. Reasons for the generation of remarks, by no. of remarks generated, during Coast Guard inspections in 2014-2017; Lögskráningar – Manning list, Réttindi – License, Veiðar – Fishing , Útivistartími – Time limits , Veiðileyfi – Fishing permit, Mengun – Pollution, Ferilvöktun – VMS, Vanmönnun – 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 (Table 13 and Table 14 below). A comparison of some of the enforcement action taken in recent years is shown in the Figure 33 below. By far the main suspected offenses detected relate to logbooks, specifically not submitting them in the required timeframes (674 incidences in 2017), and fishing in excess of or without quota (1,201 incidences in 2017). 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 13. Overview of suspected offenses in Icelandic fisheries (Source: Fiskistofa Annual Reports 2017[88] and 2016[89]).

Offenses recorded by Fiskistofa	**2017**	**2016**
Violation of landing rules (broken down into:)	52	60
• *Not landing fish at official landing location*	*5*	4
• *Weighing container*	*10*	13
• *Misreporting (Landing full size fish as part of catches of juveniles)*	*9*	22
• *Incorrect specification of species*	*11*	4
• *Other*	*17*	17
Discarding catch	8	4

[88] Fiskistofa 2017 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/medferd_mala_og_urskurdir.pdf
[89] Fiskistofa 2016 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/kafli8_2016.pdf

Violation of fishing license rules	36	15
Violation of lumpfish fishery rules	19	11
Violation of coastal fishery rules	10	46
Logbooks (broken down into:)	719	689
• *Not submitting logbooks on time*	*674*	657
• *Other*	*45*	31
Fishing in excess of or without quota	1201	1,060
Violation of law on salmon and trout fishing	1	2
Other violations	45	14
TOTALS	**2,080**	**1,901**

Table 14. Enforcement action taken (Source: Fiskistofa Annual Reports 2017 and 2016).

Offences	**2017**	**2016**
Violation of fishing rules	97	31
Violation of weighing and landing rules	71	50
Violation of logbook rules	45	31
Violation of processing catch rules	0	2
Case sent to Police	1	4
Reprimands issued (broken down below)	96	79
Due to violation of fishing rules	50	14
Due to violations of weighing and landing rules	12	31
Due to violation of logbook rules	33	26
Due to other violations	3	8
Suspension of fishing permit	31	14
Suspension of weighing license	4	1
Guidance letter sent	6	6
No action taken	33	20
Case sent to another authority	1	1
Procedure still in progress	46	8
Case returned to the inspectors	2	No data
Fees		
Reminder letter sent for unpaid fishing fees 2017	231	145
Resulting in suspension of fishing permits	89	85
Fees imposed for illegal catches	1201	130
Resulting in suspension of fishing permits	25	65

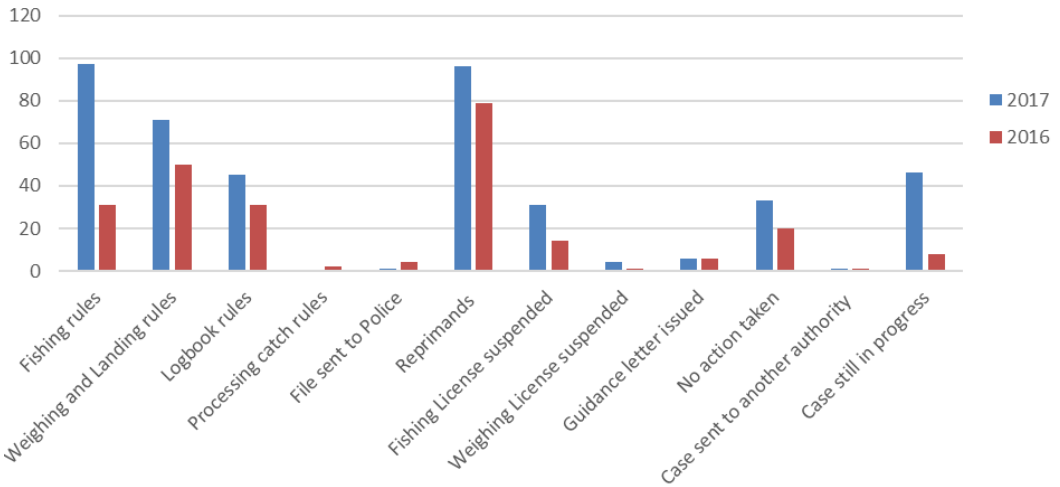

Figure 33. Comparison of some of the main areas of enforcement action taken by the Fisheries Directorate in recent years. The first four columns show the offence and the remaining columns show the enforcement action subsequently taken (Source: SAIG, based on Fiskistofa Annual Report 2017 and 2016).

References:	See footnotes.

	Acts/Laws/Regulations referenced herein may be accessed (*in Icelandic*) at http://www.althingi.is/lagasafn/ or https://www.reglugerd.is/.
Non-Conformance Number (if relevant)	**NA**

8.2.1.2. Clause 2.1.2.

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

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **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. The Fisheries Directorate website provides current information on management of the fishery including, for example, in relation to allocation of quota, opening and closure of fisheries and license revocations. Temporary and long-term fishery closures are published on-line and scientific advice on the fisheries is available on the MFRI and ICES websites.**				
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)[90]. 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.[91] All scientific advice is available online[92],[93]. Harvest control rules have been developed for Icelandic ling[94] and are scrutinised on request by an independent scientific body (ICES) with reports being published online[95]. Up-to-date maps of fisheries closures are available on-line on the Fisheries Directorate website[96]. Temporary closures are announced by the Coastguard on VHF radio on a specified wavelength and also on the radio before the news and weather (Fisheries Directorate pers. com. site visit November 2018). They are also published on the MFRI website[97] .				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

[90] http://vefbirting.oddi.is/raduneyti/fiskveidar2018/108/
[91] http://www.fiskistofa.is/
[92] ICES, 2018. ICES Advice on fishing opportunities, catch, and effort Greenland Sea and Icelandic Waters ecoregions. Ling (*Molva molva*) in Division 5.a (Iceland grounds). Published 13 June 2018. http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/lin.27.5a.pdf
[93] https://www.hafogvatn.is/en/harvesting-advice
[94] Management Strategy and Harvest Control Rules for Icelandic stocks including haddock, ling, tusk and Icelandic summer-spawning herring. https://www.government.is/news/article/2018/05/15/Haddock/
[95] ICES, 2017. Iceland request to evaluate the harvest control rule for Ling in Division 5.a. ICES Special Request Advice, Iceland Sea Ecoregion. Published 7 June 2017. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/Iceland.2017.09.pdf
[96] http://www.fiskistofa.is/fiskveidistjorn/veidibann/reglugerdarlokanir/
[97] https://www.hafogvatn.is/is/skyndilokanir

8.2.2. Clause 2.2. Concordance between actual Catch and allowable Catch

8.2.2.1. 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.[98]

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

Summary Evidence:
Concordance between the TACs and actual total catch is ensured through control, enforcement, documentation, correction and verification. Registered weights for each landing are sent to the Fisheries Directorate and the appropriate amount is subtracted from the vessel's quota. ITQ transfers are also monitored to ensure that in cases where vessels either have or source sufficient quota to cover the entirety of their catch within 3 days of landing.

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.

The Fisheries Directorate have at their disposal a number of IT based monitoring, reporting and recording systems developed and serviced by TrackWell, an Icelandic electronic systems-based service company; these include satellite Vessel Monitoring Systems (VMS), e-log systems and electronic reporting systems both of which are legal requirements and generate mandatory reports to the Directorate. Data on catches and landings is available in near real-time providing a valuable management reporting system for fleet management. The vessel log book 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) in order 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). Information from fresh fish landings is collected through the portside official weighing system which is carried out by official staff and calibrated systems.

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 days. 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)[99].

Fishing seasons in Iceland run from 1st September to 31st August the following year. Seasonal Total Allowable Catches (TACs) are set by the Minister of Fisheries and Agriculture, based on the recommendations from the Marine & Freshwater Research Institute (MFRI); the International Council for the Exploration of the Sea (ICES) also provides advice on important Icelandic stocks, such as cod, haddock, saithe and golden redfish. 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 Individual Transferrable Quotas (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.

98 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.

99 http://eng.atvinnuvegaraduneyti.is/media/reglugerdir/Regulation-224-2006-on-weighing-and-recoding-of-catch.pdf

In 2017 MFRI advised that catches of ling in Division 5a in the 2017/2018 fishing season, based on the 2017 stock assessment and in accordance with the accepted HCR, should be no more than 8,598 mt. The TAC for ling set by Icelandic authorities in the quota year 2017/2018 was 7,598 mt (Table 15). Total catches by Icelandic and non-Icelandic vessels during the 2017/2018 fishing season (information available on http://www.fiskistofa.is as of 01/11/2018) were approx. 7,825 mt or 3% over the TAC.

Table 15. Ling. Recommended TAC, national TAC set by the Ministry, and landings (tonnes) by fishing year (1st September to 31st August) (Source: modified from MFRI, 2018[100]).

FISHING YEAR	ADVICE	NATIONAL-TAC	LANDINGS
1999/2000			3961
2000/2001			3451
2001/2002	3000	3000	2968
2002/2003	3000	3000	3715
2003/2004	3000	3000	4608
2004/2005	4000	4000	5238
2005/2006	4500	5000	6961
2006/2007	5000	5000	7617
2007/2008	6000	7000	8560
2008/2009	6000	7000	10489
2009/2010	6000	7000	10713
2010/2011	7500	7500	10095
2011/2012	8800	9000	11133
2012/2013	12000	11500	12445
2013/2014	14000	13500	14983
2014/2015	14300	13800	13166
2015/2016	16200	15000	11229
2016/2017	9343	8143	8426
2017/2018	8598	7598	7825*
2018/2019	6255	5200**	

* Provisional figure (based on information available on http://www.fiskistofa.is as of 01/11/2018)
** Figure added based on info from http://www.fiskistofa.is.

As can be seen from Table 15 above and Figure 34 below, since the beginning of the time series catches of ling have generally exceed TACs; it should however be noted that the situation has improved in recent years. Since the 2012/2013 fishing season TACs have been set in line with or below recommended levels. When catches are considered relative to recommended TACs rather than actual TACs (to account for the fact that TACs have been set below recommended levels in recent years), catches of ling have been below recommended levels in each of the last four fishing seasons (Figure 34 bottom).

Note catch balancing mechanisms may contribute to TAC under/overshoots in some years. For example, an undershoot in one year or interspecies transfers may result in additional quota, over and above the initial TAC set at the beginning of the season, becoming available; over time inter-annual and inter-species transfers should balance themselves.

100 https://www.hafogvatn.is/static/extras/images/Ling_Molva_molva_2018_06729173.pdf

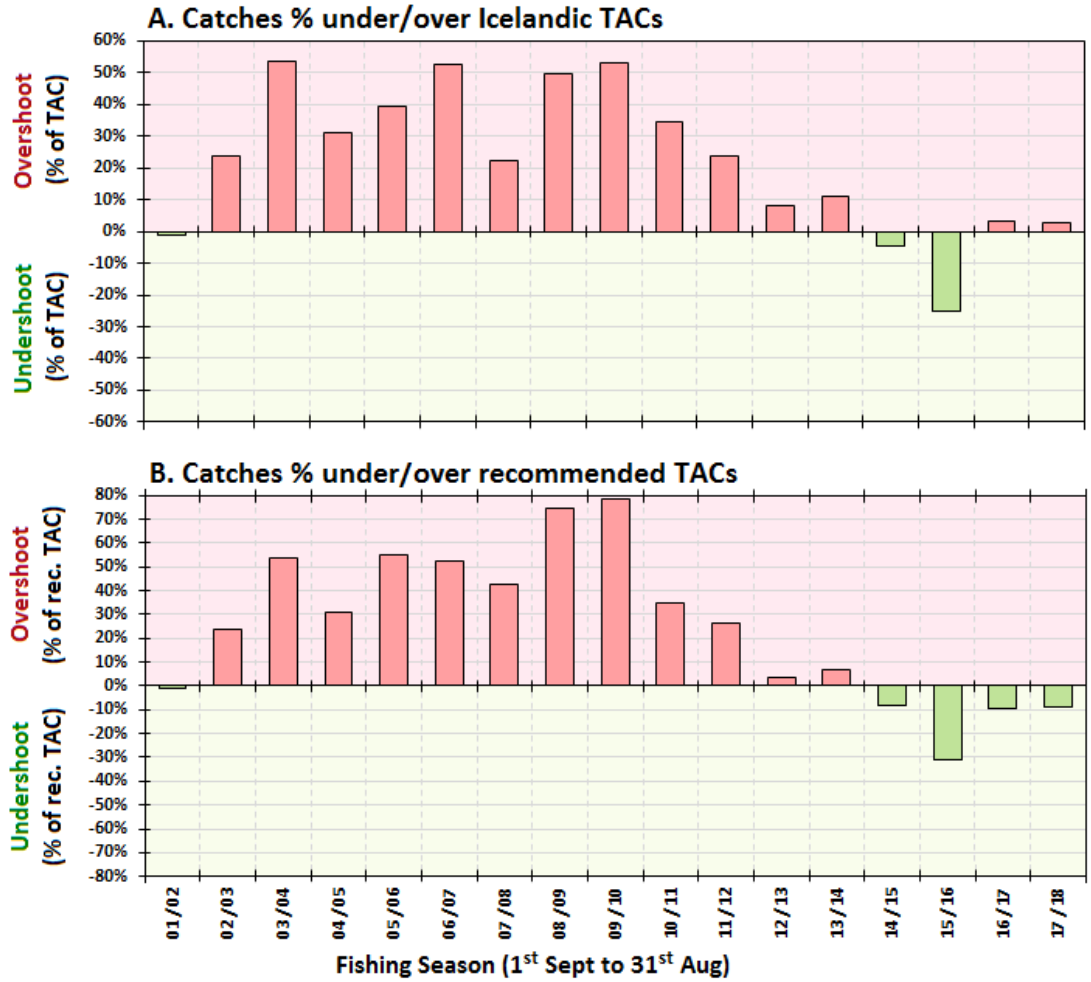

Figure 34. Total landings of ling % under/over Iceland TACs (top) and recommended TACs (bottom) (2001/2002 – 2017/2018) (Source: Data from MRI 2018[101]).

In June 2018, MFRI advised that catches of ling in the 2018/2019 fishing season, based on the 2018 stock assessment and in accordance with the accepted HCR and management plan, should be no more than 6,255 mt; the Icelandic TAC for the 2018/2019 season has been set at 5,200 mt.

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

8.2.2.2. 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 feed-back 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.**				

101 https://www.hafogvatn.is/static/extras/images/Ling_Molva_molva_2018_06729173.pdf

Evidence: The Fisheries Directorate have at their disposal a number of IT based monitoring, reporting and recording systems; these include satellite Vessel Monitoring Systems (VMS), e-log systems and electronic reporting systems. Data on catches and landings is available in near real-time providing a valuable management reporting system for fleet management. The vessel log book 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) in order 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 from fresh fish landings is collected through the portside official weighing system that is carried out by official staff and calibrated systems and which is developed to use standardised weights and tares for ice and tubs. The weight registration document for each vessel is transmitted to the Directorate which also receives the e-logbook information where the two datasets are compared before the appropriate reduction is made to the vessel's quota. In some cases, an approved in house company or auction weighing system is used which has been verified by Directorate staff. The system works for all official Icelandic weighing stations and auctions and also for foreign ports with an official designation from the Directorate. Catches processed at sea are registered as processed weights using an officially approved yield which is monitored and verified by the Directorate. Processed weights are converted to live weight equivalents for deduction from each vessels quota and management purposes by staff at the Directorate. The distribution of the various pieces of information is managed by a central server which enables secure data encryption and backup of the transmitted data. Information is also 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).
References:

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

8.2.2.3. 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 where appropriate.

Evidence:
Corrective management measures including appropriate adjustments to TACs are implemented where appropriate. Since the beginning of the time series catches of ling have generally exceeded TACs; it should however be noted that the current HCR is still in its infancy and the situation has improved markedly in recent years. One of the main reasons for ling catches continually exceeding recommended TACs was the fact that catches by non-Icelandic vessels were until recently not accounted for when setting Icelandic TACs; effectively, the entire recommended TAC was allocated to Icelandic vessels.

Recognising the issue, the Ministry has begun compensating for those excess catches by not allocating a portion of the recommended TAC to Icelandic vessels; in the last 8 fishing season Icelandic ling TACs have been set below recommended levels. This is done to account for the fact that catches by foreign vessels are not included in the TAC on the understanding that those catches will then effectively "bridge the gap" between the Icelandic TAC and recommended TAC (Figure 35). In the three fishing seasons to date in which the current HCR, Icelandic TACs for ling have been set well (12%, 16% and 20% respectively) below recommended levels. These pre-emptive adjustments to ling TACs have led to a situation where, even considering quota balancing mechanisms, catches of ling have been below recommended levels in each of the last four fishing seasons (see Figure 34).

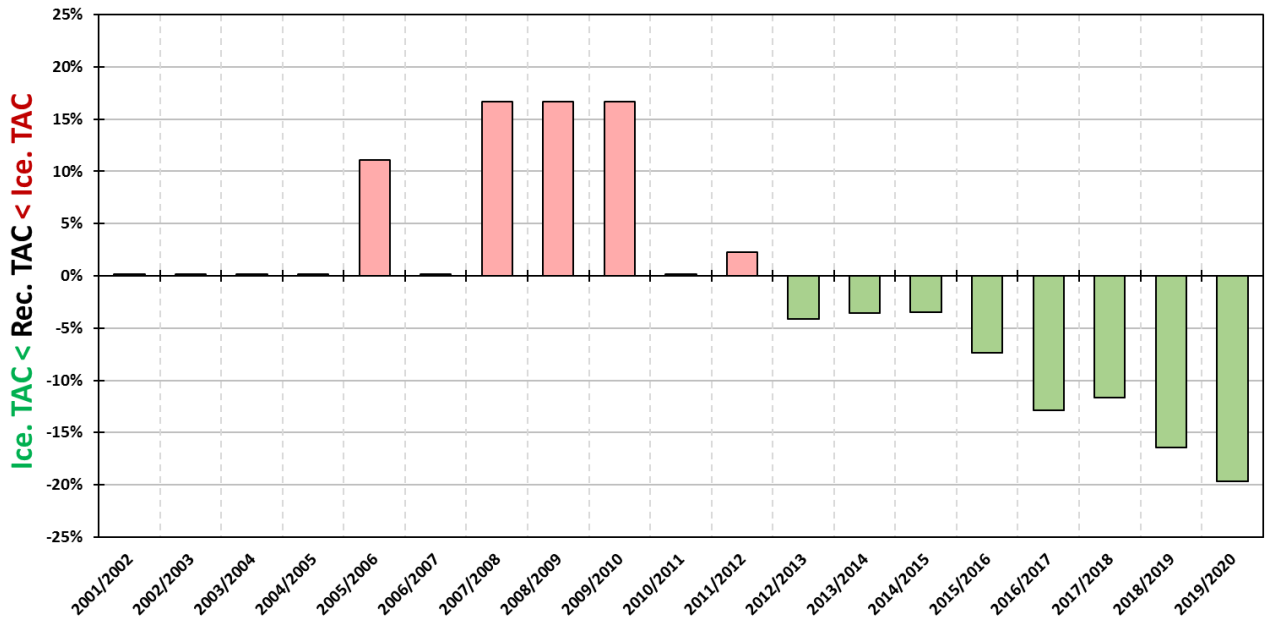

Figure 35. Icelandic TACs for ling % under/over recommended TACs (2001/2002 to 2019/2020) (Source: data from MFRI 2019[102] and IRFF, 2019[103]).

In addition to the types of adjustment outlined above, under the current management plan HR_{MGT} is set at an additionally precautionary 0.18, well below both HR_{pa} (0.35) and HR_{MSY} (0.24). The result of this increased "buffer" means that the management system for ling is inherently robust to the fact that catch-balancing mechanisms may in any year (or in a number of years) result in catches exceeding TACs.

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

8.2.2.4. 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:

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

Evidence:

Vessels 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, 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.

102 https://www.hafogvatn.is/static/extras/images/06-Ling1141517.pdf

103 https://www.responsiblefisheries.is/news-and-media/news/tac-quotas-for-2019-2020-follow-scientific-advice

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

8.2.3. Clause 2.3. Monitoring and Control

8.2.3.1. Clause 2.3.1. Vessel registration and catch quotas

8.2.3.1.1. 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 increase or decrease.**				
Evidence: Quotas conform to the overall decision on TAC, through individual vessels' quota shares 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. As previously discussed, catches by vessel are monitored and recorded in near real-time in a central database curated by the Fisheries Directorate. 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, keep 20% of the value of the overage while forfeiting the remainder 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:				
Non-Conformance Number (if relevant)				**NA**

8.2.3.1.2. 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 ling. 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. Greenland, Faroe Islands) (Act on fishing in Iceland's EEZ, No. 79/1997). 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)[77].				

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

8.2.3.1.3. 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 or vessel group for each fish species and fishing year is recorded in the official central data base and is readily accessible to stakeholders in a transparent manner.

Evidence:

Registered catches are based on information from ports of landing and information on catches exported unprocessed. Catch statistics are published by individual vessel and are readily available online[104]. 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 Table 16 shows the first 10 lines of the publicly available data on individual vessels' quota allocations of ling in the 2017/2018 fishing season.

Table 16. First 10 lines of table showing the Icelandic ling TAC allocations, transfers, balances and catches (in tonnes) for the 2016/2017 fishing season (Source: Fiskistofa[105]).

Reg. no.	Vessel	Class	Alloc. quota	Compen-sations	Trfr. prev. year	Trfr. b/t vessels	Allowed catch	Catch	Balance	Over fished
78	Ísborg ÍS 250	A	0	624	0	-624	0	0	0	0
89	Grímsnes GK 555	A	12,079	0	765	58,449	71,293	66,213	5,080	0
173	Sigurður Ólafsson SF 44	A	4,148	0	1,334	30,200	35,682	24,979	10,703	0
177	Fönix ST 177	A	0	274	0	0	274	0	274	0
182	Vestri BA 63	A	2,527	386	596	-30	3,479	2,886	593	0
233	Erling KE 140	A	35,606	1,021	4,726	-29,055	12,298	6,957	5,341	0
253	Hamar SH 224	A	14,294	302	650	25,000	40,246	27,204	13,042	0
264	Hörður Björnsson ÞH 260	A	7,464	7,404	2,375	75,481	92,724	72,829	19,895	0
288	Jökull SK 16	A	0	269	0	-269	0	0	0	0
363	Maron GK 522	A	3,169	0	23	63,003	66,195	48,071	18,124	0

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

8.2.3.1.4. 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:

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

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;[106]
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 ling for each vessel or vessel group is specified on the Fisheries Directorate website.**				
Evidence: As noted in clause 2.3.1.2 vessels participating in the fishery 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 for further information. As discussed previously, the allowed catch by species, for all quota species including the stock under consideration here, for each vessel is specified and this information is publicly available online at: http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

106 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.

8.2.3.2. Clause 2.3.2. Fishing vessel monitoring and control systems

8.2.3.2.1. 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. 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. VMS is used by the Coastguard to enforce temporary and long-term fisheries closures. 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.

Evidence:

The Icelandic Coastguard 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 (MCS) system. The purposes of the MCS 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[107]. 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 are able to 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 illegal, unreported and unregulated (IUU) fishing in the Icelandic Exclusive Economic Zone (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 when operating in Icelandic waters.

The ICG uses several different but complementary electronic vessel monitoring systems including satellite-based systems including VMS and satellite radar images, the monitoring of coastal activity through a dedicated land-based very high frequency (VHF) system and the use of the Automatic Identification System (AIS). During the February 2018 site visit, the assessment team visited the Operation Centre and witnessed these systems in use.

The VHF and AIS systems have a range of 30 – 60 nautical miles while the satellite-based VMSs can be used anywhere in the world. The use of complementary systems ensures that the limitations that arise when any one system is used in a standalone capacity are mitigated. These electronic MCS systems are further backed up by more traditional methods of surveillance such as patrol vessels and aircraft; indeed the use of electronic systems in the effective targeting of traditional surveillance methods increases the efficiency of these systems. Recently satellite imagery has been added to the list of surveillance methods (80 images are taken each month) which can be used for example in detection of the uncommon occurrence of vessels not using VMS (Coast Guard pers. comm., site visit November 2018).

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

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 below schematic outlines the inputs which make up the integrated MCS system in Iceland (Figure 36).

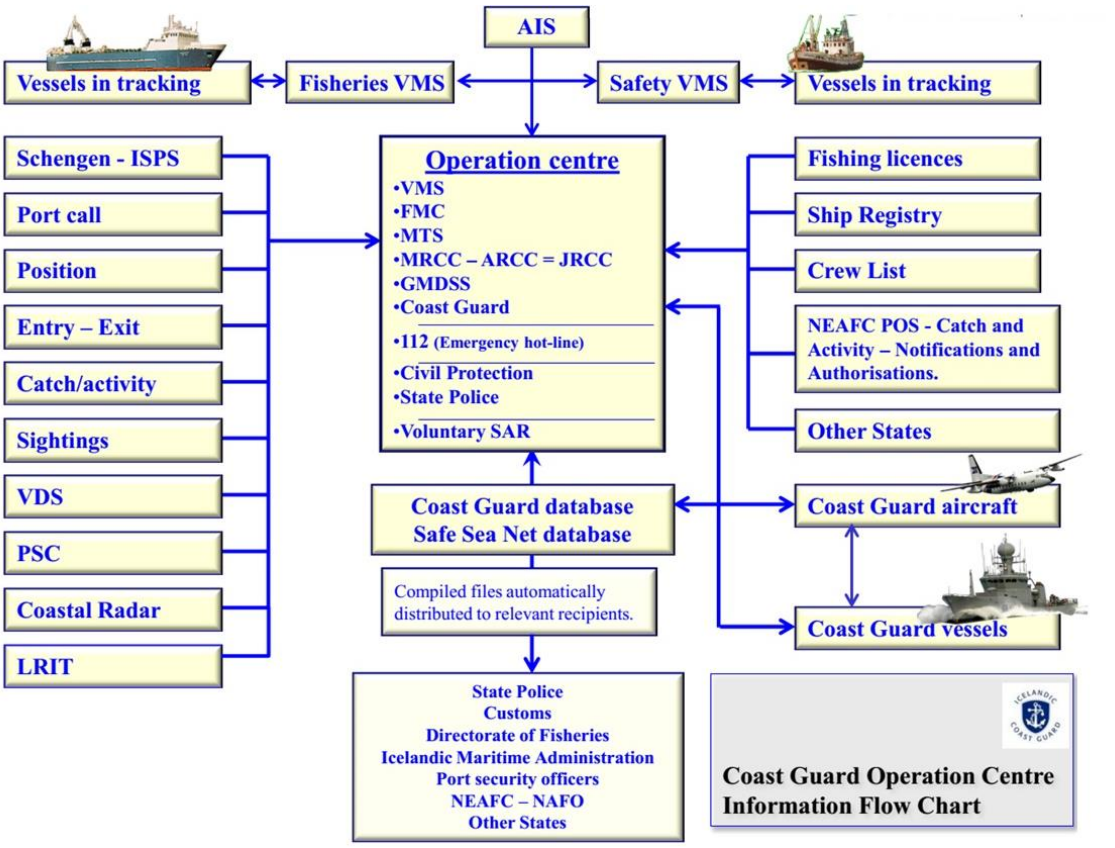

Figure 36. Schematic outlining the inputs which make up the integrated Monitoring, Control and Surveillance (MCS) system in Iceland. (Source: presentation entitled Iceland's application for membership of the EU. Chapter 13, 28 February Icelandic Coast Guard ERS/VMS/AIS[108])

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

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. Inspectors check that samples taken to monitor this process are correctly taken and accurately reflect the processing utilisation[109],[110].Days spent by inspectors of the Fisheries Directorate at sea inspecting vessels as a proportion of total fishing effort is shown in the Table 17 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 requirements.

Table 17. 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%

[108] https://slideplayer.com/slide/4644333/
[109] The Icelandic Directorate of Fisheries – Responsibilities and main tasks. Page 8. http://www.fiskistofa.is/media/utgefid_efni/DOF.pdf
[110] Fiskistofa Annual Report, 2017. Maritime surveillance chapter. http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-sjo/

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. This 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 and long-term 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 escalate if necessary.

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

8.2.3.2.2. 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[111],[112]. 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. Further information is presented in clauses 2.1.1 and 2.3.2.1.

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

[111] The Icelandic Directorate of Fisheries – Responsibilities and main tasks. Page 8. http://www.fiskistofa.is/media/utgefid_efni/DOF.pdf
[112] Fiskistofa Annual Report, 2017. Maritime surveillance chapter. http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-sjo/

8.2.3.2.3. 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: **Areas closed to fishing are monitored by the authorities primarily the Icelandic Coastguard.**				
Evidence: Both short and long-term closures are primarily monitored and enforced by the Icelandic Coastguard using the available AIS and VMS systems. 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 escalate if necessary.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.2.3.2.4. 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 mammal 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; note the Assessment Team were informed during the on-site visit that efforts are currently underway to provide small vessels with a smartphone app through which they can transmit logbook data electronically. The recording of marine mammals and seabirds by number and species is required by Icelandic regulation[113]. 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.* [114] and the March 2018 MFRI report titled: "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. 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				

[113] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967
[114] https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf

the fleet in 2017[115]. Furthermore according to a 2017 presentation to NAMMCO's Working group on bycatch of marine mammals; "logbooks have unfortunately proven unreliable" and "bycatch of birds and marine mammals [is] 18x higher when observer is present vs logbook records". While much of the evidence related to non-compliance with reporting requirements may relate to the lumpsucker fishery, this fishery is still part of the management system under review and in addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better; therefore, the Assessment Team have deemed a **Minor Non-conformance** to be appropriate in this instance. As this represents the first non-conformances raised in this assessment, this non-conformance will be termed Non-conformance #1. **Non-conformance #1 (Clause 2.3.2.4: Minor Non-conformance)** Although required by legislation, there is some evidence of extensive 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 at surveillance audits (See 10. Non-conformances and Corrective Actions for further details).**

References:	See footnotes.
Non-Conformance Number (if relevant)	**1**

8.2.3.2.5. 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: **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: It is a legal requirement that vessels give inspectors of the Fisheries Directorate and the Coast Guard access to their logbooks (Regulation on Catch Books No. 746/2016)[116]. 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.				
References:	See footnote.			
Non-Conformance Number (if relevant)				**NA**

8.2.3.2.6. 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. Directorate inspectors also perform checks in port.**				

[115] https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf
[116] https://www.stjornartidindi.is/Advert.aspx?RecordID=42a16a67-60a7-4ae7-ad7c-0f53fc254654

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 vessels that process their catch on board. 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:	
Non-Conformance Number (if relevant)	**NA**

8.2.3.2.7. Clause 2.3.2.7.

Discarding of catch from 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 catch from stock under consideration is prohibited as part of a complete ban on discarding in Icelandic waters. Discarding that may occur is 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 is specified.

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 ling. 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 (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 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 2017, discards were measured from bottom trawl and line gear[117].

[117] Fiskistofa Annual Report, 2017. Maritime Surveillance section. http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-sjo/

Comparison between observer/inspector measured catch compositions and self-reporting by fishers ensures that a high level of compliance with the ban on discarding is maintained. Discards are not included in the fisheries assessments as they are generally considered to be negligible; however, should the situation change and discards increase then these changes should be detectable within the system.	
References:	See footnotes.
Non-Conformance Number (if relevant)	**NA**

8.2.3.2.8. 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 must comply with relevant national fishery management and technical conservation measures.**				
Evidence: Vessels are required to comply with relevant national fishery management and technical conservation measures. Penalties for violations of fishery management rules and regulations are in place and can include (depending on the violation) imprisonment, confiscation of fishing gear and catch, temporary suspension of licenses and fines of increasing magnitude depending on the severity of the offense and whether or not it represents a repeat violation.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.2.3.2.9. 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 measures are in place and are conducted in a manner to encourage and demonstrate compliance (and deter unreported landings).**				
Evidence: As previously discussed throughout this section there are extensive monitoring and control measures in place. These are an integral part of the Icelandic 'management model' which has been designed in such a way that compliance is encouraged. There are many provisions within the system to increase flexibility and provide avenues to address the majority of issues fishers might encounter within the system. The level of flexibility allowed for within the rules and regulations provides many alternative pathways that fishers may use to avoid non-compliance with rules and regulations and effectively encourages compliance. The system is transparent with information relating to the quota allocations and performance of individual vessels being readily publicly available[118]. This transparency in effect introduces an element of 'self-policing' into the management system and information provided by authorities indicates that fishers are prepared to report non-compliance on the part of their fellow fishers to the relevant authorities.				
References:	See footnote.			
Non-Conformance Number (if relevant)				**NA**

[118] http://www.fiskistofa.is/fyrirspurnatorg/fyrirspurnir-tengdar-afla/

8.2.3.2.10. 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[119] 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. Landings were previously permitted at authorised foreign ports, but this is no longer the case following Regulation No. 745/2016 (Article 1) 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:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.2.3.2.11. 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. Species within the Icelandic quota system are as set out in Table 18 below.				

119 Act 57/1996 Treatment of Commercial Marine Stocks Act: http://www.althingi.is/lagas/nuna/1996057.html

Table 18. Species in the Icelandic quota system (Source:[120])

Cod *Þorskur*	Haddock *Ýsa*	Saithe *Ufsi*
Golden redfish *Karfi/gullkarfi*	Ling *Langa*	Blue ling *Blálanga*
Tusk *Keila*	Atlantic wolffish *Steinbítur*	Spotted wolffish *Hlýri*
Angler *Skötuselur*	Greater Argentine *Gulllax*	Greenland halibut *Grálúða*
Plaice *Skarkoli*	Lemon sole *Þykkvalúra / Sólkoli*	Witch flounder *Langlúra*
Common dab *Sandkoli*	Long rough dab *Skrápflúra*	Atlantic herring *Síld*
Norway lobster *Humar*	Shrimp – Offshore *Rækja – Úh.*	Shrimp - Arnarfjord *Rækja – Arn.*
Shrimp – Djúp *Rækja - Djúp*	Shrimp – Snæfellsnes *Rækja Sn.*	Norway redfish *Litli karfi*
Scallop – Breidafjord *Skel - Breid.*	Deepwater redfish *Djúpkarfi*	

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[121]. 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.

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

8.2.3.2.12. 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 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).

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[122,123] recording:

- Vessel name, registration number and district number;
- Landing port and date of landing;

[120] http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/
[121] http://www.fiskistofa.is/veidar/aflaupplysingar/afliallartegundir/
[122] https://www.fmis.is/blank
[123] http://www.unuftp.is/static/fellows/document/pan09prf.pdf

- 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.

The information is sent within 1 day by port authorities to the Fisheries Directorate who record it on their Catch Registration System (The Directorate of Fisheries and Landing Ports database, GAFL). 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 not real time but 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'[124]. 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 (GAFL). 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 vessels 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. Monitoring by the Directorate found significant deviations in the percentage of ice recorded in the catch when inspectors were present compared to when they were not[125]. The results of this monitoring are published on the 'news' page of Directorate's website[126] as bi-monthly reports[127].

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))[128]. 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.

[124] http://www.fiskistofa.is/fiskveidistjorn/vigtunafla/
[125] Fiskistofa Annual Report 2017. http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-landi/
[126] http://www.fiskistofa.is/umfiskistofu/frettir/
[127] http://www.fiskistofa.is/umfiskistofu/frettir/ishlutfall-i-november-og-desember
[128] https://www.althingi.is/altext/stjt/2017.048.html

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

8.2.3.2.13. 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 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:	
Non-Conformance Number (if relevant)	**NA**

8.2.3.2.14. 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:
The weight by species of all catches of stock under consideration and by-catch species is measured by authorised harbour officials at landing and recorded in the official central data base.

Evidence:

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. 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. See evidence presented in clause 2.3.2.13

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

8.2.3.2.15. 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 discussed throughout this section 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.

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

8.2.3.2.16. 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:
D**ata 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:

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 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. 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.
References:

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

8.2.3.2.17. Clause 2.3.2.17.

In cases of passive fishing gear left unattended at sea, there shall be regulation that requires fishing gear to be marked so that the owner can be identified, where relevant.[129]

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
Summary Evidence: **In cases of passive fishing gear left unattended at sea, there are regulations that requires fishing gear to be marked so that the owner can be identified. Note: Acts/Laws and Regulations referenced herein may be accessed (*in Icelandic*) at http://www.althingi.is/lagasafn/ (for Acts/Laws) or https://www.reglugerd.is/ (for Regulations).**				
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 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 Laws and regulations[130]. 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 nets targeting cod. These provisions are contained in Regulation 115/2006[131]. 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. Other regulations with specific requirements for gear marking include: ▪ 202/2016, Lumpfish-fishing (Articles 7 and 11)[132] ▪ 1012/2013, on fishing whelk in traps (Paragraph 5)[133] ▪ 1070/2015, the fishing of crabs in the inner Faxaflói (Paragraph 4)[134] ▪ 923/2010, Monkfish-fishing (Paragraph 4)[135] ▪ 449/2013 Regulation of equipment and nets fishing for trout (Paragraph 6)[136]			
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.2.3.3. Clause 2.3.3. Catches are subtracted from relevant quotas

8.2.3.3.1. 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 for a particular vessel/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**				

129 This clause is applicable to gillnets, traps and pots.
130 http://vefbirting.oddi.is/raduneyti/fiskveidar2018/108/
131 http://www.reglugerd.is/reglugerdir/allar/nr/115-2006
132 http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/20032
133 https://www.stjornartidindi.is/Advert.aspx?RecordID=024102ac-de04-45ce-99e3-5e83af6d6aae
134 http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/19883
135 https://www.stjornartidindi.is/Advert.aspx?RecordID=437308e0-8ad1-4009-98cb-10266317ed3e
136 http://www.reglugerd.is/reglugerdir/allar/nr/449-2013

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 not real time but is very 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. Catches processed at sea are registered as processed weights using an officially approved yield which is monitored by the Directorate. Weights at landing are checked 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.
References:

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

8.2.3.3.2. 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:
Limited allowance is 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:
The Icelandic quota management system incorporates a degree of flexibility 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 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[137]. Note that it is not possible to convert quota of other species for cod quota (e.g. cod quota may be exchanged for ling quota, but ling quota may not be exchanged for cod).
The cod-equivalent values of a number of representative species during the 2011/2012 to 2017/2018 season are presented in Table 19. As can be seen the cod-equivalent value for more commercially valuable species is consistently higher across seasons.

Table 19. Cod-equivalent values of representative species in recent fishing seasons.

Species	**Cod Equivalents**						
Season	**2011/2012**	**2012/2013**	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**
Cod	***1.00***	***1.00***	***1.00***	***1.00***	***1.00***	***1.00***	***1.00***
Haddock	0.89	0.92	1.15	1.30	1.23	1.04	1.07
Norway lobster	4.35	4.70	6.46	5.98	5.98	6.10	8.12
Anglerfish	1.57	1.74	1.98	2.27	2.05	2.17	2.10
Ling	**0.55**	**0.59**	**0.73**	**0.76**	**0.68**	**0.68**	**0.73**

[137] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/

Tusk	0.37	0.39	0.52	0.51	0.47	0.42	0.38
Mackerel	0.22	0.36	0.36	0.41	0.32	0.21	0.26
Capelin	0.10	0.08	0.14	0.14	0.12	0.17	0.13
ISS herring	0.13	0.20	0.26	0.21	0.22	0.18	0.23
AS herring	0.16	0.25	0.33	0.29	0.23	0.19	0.23
Atlantic wolffish	0.83	0.85	0.95	0.95	0.79	0.64	0.59
Greenland halibut	2.12	2.47	2.67	2.59	2.48	2.65	2.61

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

8.2.3.3.3. 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 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 system so that the species composition of catches may be matched with the vessel's quota portfolio. There are a variety of provisions in place to facilitate this flexibility 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 vessel's 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; 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 transfer quota between different species with transfers being 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[138]. Note that it is not possible to convert quota of other species for cod quota. The results of some of inter-vessel and inter-seasonal transfers aimed at balancing catches and quotas may be seen 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 11, Act No. 116/1996).[139] 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 practices.

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

[138] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/
[139] http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Sveigjanleiki_i_aflamarkskerfinu

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

8.2.3.3.4. 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: **Inter-vessel transfers of quota only take effect once authorised and recorded on the central database.**				
Evidence: 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. The transfer does not take effect until the Fisheries Administration has confirmed them (Article 15, Act No. 116/2006). Application forms for the transfer of quota are available online 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:	See footnote.			
Non-Conformance Number (if relevant)				**NA**

8.2.3.3.5. 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 web-site, 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 regularly and made public and accessible to all on the official 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[140]. 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)				

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

8. Overfished For illustrative purposes see the table in the supporting evidence for Clause 2.3.1.3 showing the first 10 lines of the publicly available data on individual vessels' quota allocations of ling in the 2016/2017 fishing season.	
References:	See footnotes.
Non-Conformance Number (if relevant)	**NA**

8.2.3.4. Clause 2.3.4. Rules are enforced

8.2.3.4.1. 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 MRI 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; Articles 15-17 of Act No. 79/1997; Chapter 4 of Act no. 57/1996).

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, within the remit of the overall Ministry of Industries and innovation, the MRI 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 37). 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.

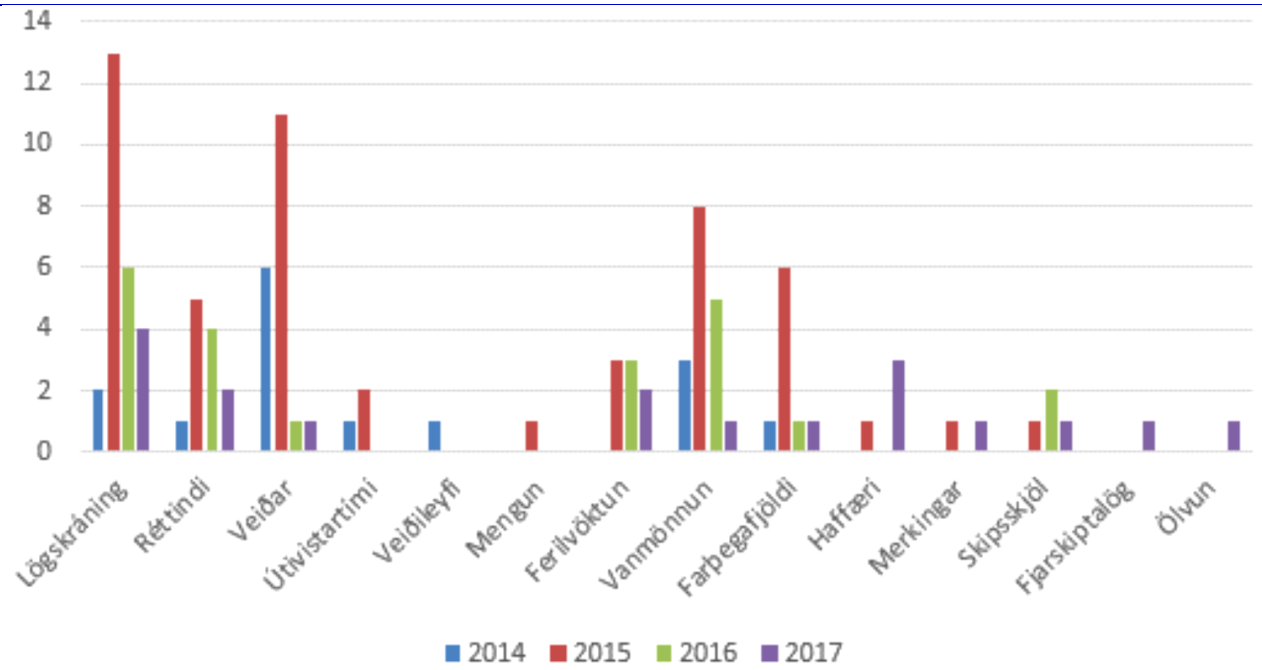

Figure 37. Reasons for the generation of remarks, by no. of remarks generated, during Coast Guard inspections in 2014-2017; Lögskráningar – Manning list, Réttindi – License, Veiðar – Fishing, Útivistartími – time limits for fishing, Veiðileyfi – Fishing permit, Mengun – Pollution, Ferilvöktun – VMS, 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 (Table 20 and Table 21 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 (674 incidences in 2017), and fishing in excess of or without quota (1,201 incidences in 2017). 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 20. Overview of suspected offenses recorded (Source Fiskistofa Annual Reports 2017[141] and 2016[142]).

Offenses recorded by Fiskistofa	2017	2016
Violation of landing rules (broken down into:)	52	60
• *Not landing fish at official landing location*	*5*	4
• *Weighing container*	*10*	13
• *Misreporting (Landing full size fish as part of catches of juveniles)*	*9*	22
• *Incorrect specification of species*	*11*	4
• *Other*	*17*	17

[141] Fiskistofa 2017 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/medferd_mala_og_urskurdir.pdf
[142] Fiskistofa 2016 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/kafli8_2016.pdf

Discarding catch	8	4
Violation of fishing license rules	36	15
Violation of lumpfish fishery rules	19	11
Violation of coastal fishery rules	10	46
Logbooks (broken down into:)	719	689
• *Not submitting logbooks on time*	*674*	657
• *Other*	*45*	31
Fishing in excess of or without quota	1201	1,060
Violation of law on salmon and trout fishing	1	2
Other violations	45	14
TOTALS	**2,080**	**1,901**

Table 21. Enforcement action taken (Source: Fiskistofa Annual Reports 2017 and 2016).

Offences	**2017**	**2016**
Violation of fishing rules	97	31
Violation of weighing and landing rules	71	50
Violation of logbook rules	45	31
Violation of processing catch rules	0	2
Case sent to Police	1	4
Reprimands issued (broken down below)	96	79
Due to violation of fishing rules	50	14
Due to violations of weighing and landing rules	12	31
Due to violation of logbook rules	33	26
Due to other violations	3	8
Suspension of fishing permit	31	14
Suspension of weighing license	4	1
Guidance letter sent	6	6
No action taken	33	20
Case sent to another authority	1	1
Procedure still in progress	46	8
Case returned to the inspectors	2	No data
Fees		
Reminder letter sent for unpaid fishing fees 2017	231	145
Resulting in suspension of fishing permits	89	85
Fees imposed for illegal catches	1201	130
Resulting in suspension of fishing permits	25	65

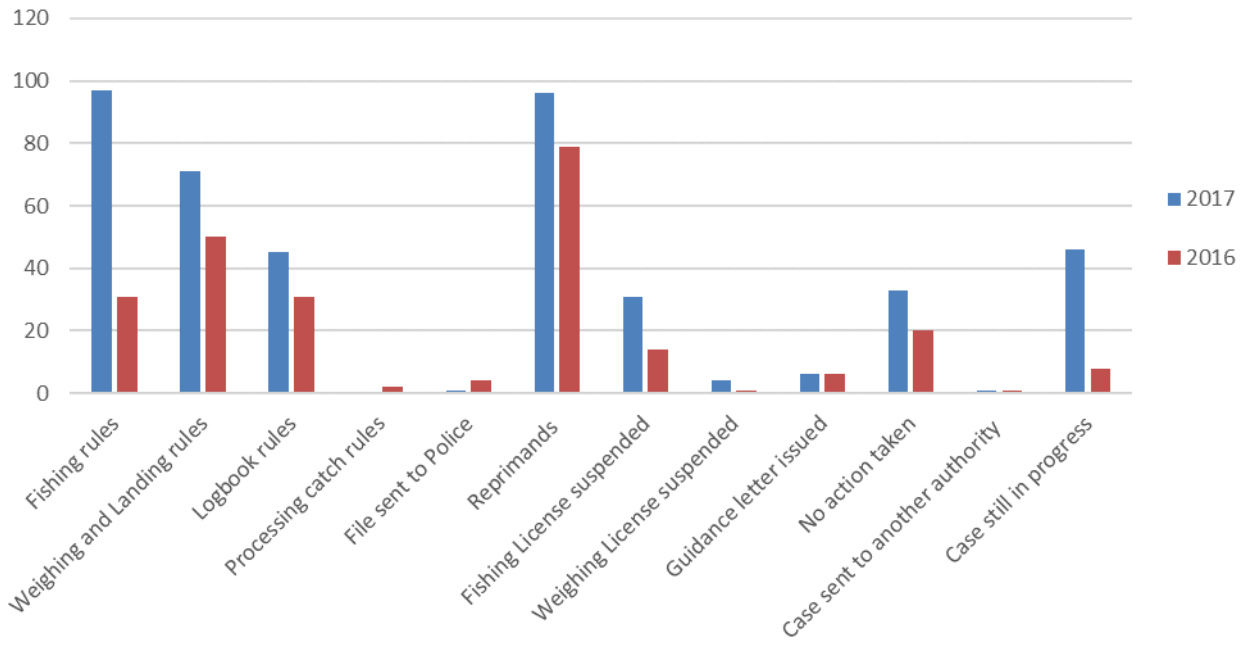

Figure 38. Comparison of some of the main areas of enforcement action taken by the Fisheries Directorate in recent years. The first four columns show the violation and the remaining columns show the enforcement action subsequently taken (Source: SAIG, based on Fiskistofa Annual Report 2017 and 2016).

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

8.2.3.5. Clause 2.3.5. Analysis is carried out

8.2.3.5.1. 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 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.**				
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 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. Corrective measures are available and are adopted when indicated. A specific example of this from the ling fishery is presented in the supporting evidence for Clause 2.2.3.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

8.2.3.5.2. 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: **Anyone purchasing and/or selling catches must submit reports to the appropriate authorities, containing information on the purchase, sale and other disposition of fish catches. If analysis reveals discrepancies between the information in the reports and that received from weighing, corrective measures are 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. 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.				
References:				
Non-Conformance Number (if relevant)				**NA**

8.2.3.5.3. 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, 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 whence 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:	
Non-Conformance Number (if relevant)	**NA**

8.3. Section 3: Ecosystem Considerations

8.3.1. Clause 3.1. Guiding Principle

8.3.1.1. Clause 3.1.1.

Adverse impacts of the fishery on the ecosystem shall be considered and appropriately assessed and effectively addressed[143], consistent with the precautionary approach[144].

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

Summary Evidence:

The MFRI undertakes research into fish stocks, the wider marine ecosystem and their interaction with fisheries. The Institute provides scientific advice on fisheries management within an ecosystem approach framework. Within Icelandic fisheries, discarding of commercial species is prohibited and all commercial species caught must be landed subject to the limited flexibility built into the system. This also applies to protected species, including Atlantic halibut, spurdog, porbeagle and basking sharks unless they are caught alive in which case they must be released.

Icelandic ling are mainly caught in longline fisheries and by demersal trawl with the remainder mainly taken by gillnet, *Nephrops* trawl and Danish seines. There are 15 species caught with ling. Cod, golden redfish, saithe, haddock and Greenland halibut make up the vast majority of the retained catch alongside ling and are all above their biological limit points and MSY $B_{trigger}$. With ling, these species represent approximately 90-100% of the catch in the longline, demersal trawl and gillnet fisheries, and 70% of the gillnet fishery. The other species represent a small proportion of the catch of each gear. They generally have high biomass and low fishing mortality except for deepsea redfish, *Nephrops* and anglerfish, the stocks of which are considered low although fishing mortality is also low.

Understanding of the by-catch of non-commercial species and marine mammals and seabirds is limited as there hasn't been systematic recording and there are concerns about the reliability of logbook and observer records. Measures have been put in place to improve recording by observers but there are still significant differences between logbook and observer records. This disparity has been observed in the lumpsucker gillnet fishery but it is not clear how representative this is of other Icelandic fisheries. Further work is being undertaken in this area particularly in relation to the higher risk gillnet fisheries through the Committee for Consultation on Responsible Management of Living Marine Resources. Vulnerable species that the fishery may interact with include grey skate, Atlantic halibut, spurdog, Greenland shark and porbeagle. The stock status of these species is unknown or at low levels but Icelandic landings are also low. Measures are in place to reduce catches of the protected species Atlantic halibut, spurdog, porbeagle and basking shark as mentioned previously.

Low levels of seabird and marine mammal by-catch have been recorded in Icelandic fisheries with the exception of the gillnet fisheries. In the lumpsucker gillnet fishery high levels of seal by-catch have been recorded but ling is not caught in this fishery. Ling is caught in the cod gillnet fishery, but this forms a relatively small proportion of total commercial ling catches at 8% in 2016/2017. In the cod gillnet fishery, the main marine mammal by-catch is harbour porpoise. By-catch rates have been decreasing in recent years as netting has decreased, although in 2016 there was five-fold increase in catches thought to be due to changing density of porpoise on the fishing grounds. The by-catch of porpoise in 2016 is at or higher than the 1.7% limit for anthropogenic mortality on harbour porpoise populations recommended by ASCOBANS. However, it should be noted that there is uncertainty over the current harbour population size Recent observations also suggest that the replacement potential of porpoise is higher than implied by the 1.7% reference point. For these reasons we do not consider the evidence supports that a population level impact is occurring. Work is on-going to update the harbour porpoise population estimate through genetic research. Testing of the efficacy of pingers in reducing porpoise by-catch in the gillnet fishery has been undertaken recently but their use showed no reduction in by-catch.

143 FAO Code of Conduct for Responsible Fisheries, Article 7.2.

144 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. ...

Information is available on Iceland's seabed habitats and VMEs and further work is being undertaken to map VMEs and identify areas at risk from fishing activity. Closures are in place to protect sensitive cold water coral communities and other VMEs receive de facto protection from other closures for example closure of coastal areas within 4-12nm to bottom trawls.

The available evidence indicates that the adverse impacts of the fishery on the ecosystem are considered, assessed and appropriately addressed in a manner consistent with the precautionary approach as required by the IRFF Standard. Further evidence of reliable data collection from the improved observer programme and the electronic logbook reporting system would increase confidence that there are no adverse impacts on vulnerable species, marine mammals and seabirds. By-catch rates of harbour porpoise should be kept under review and assessed in light of updated stock assessments as they come available. Further action may be required if rates remain high.

Evidence:

The Marine and Freshwater Research Institute of Iceland (MFRI) is a government institute under the auspices of the Ministry of Industries and Innovation with responsibility for marine and freshwater research and the provision of scientific advice to the Ministry. It was founded in 2016 following the merger of the Institute of Freshwater Fisheries and the Marine Research Institute[145]. The MFRI's main research priorities are:

- Research on marine and freshwater ecosystems
- Sustainable exploitation of fish stocks
- Ecosystem approach to fisheries management
- Research on fishing technology
- Seafloor and habitat mapping

This involves investigations into environmental conditions, marine geology, the ecology of algae, zooplankton, fish larvae, fish juveniles, and benthos, investigates surface currents, assessment of primary productivity, overwintering and spring spawning of zooplankton and studies on spawning of commercial fish stocks.

The MRFI undertakes annual surveys and prepares stock assessments of commercially exploited stocks, providing formal advice on TACs and sustainable fishing strategies for managers. The MFRI also monitors the wider marine ecosystem, undertaking collection and analysis of oceanographic and physical data, measurement of retained catches and interactions between Endangered, Threatened and Protected species (ETPs) and commercial fisheries, fishing gears and seabed habitats and between commercial fisheries and the ecosystem e.g. impacts of fisheries on predator-prey dynamics.

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. Analysis of environmental conditions around Iceland have shown that seasonal conditions vary markedly between years and that, in general, warm currents to the north of Iceland result in increased overall production. However, there is a complex web of environmental factors which drive fluctuations in the abundance and distribution of commercial stocks around Iceland.

Key ecosystem and environmental signals in Icelandic waters in 2018[146]

- Zooplankton biomass on the northern shelf has fluctuated in the past, cycling on a five- to ten-year periodicity, with a period of generally low biomass from the 1960s to the 1990s.
- From the mid-2000s, Atlantic mackerel *Scomber scombrus* extended its feeding grounds from the Norwegian Sea to Icelandic Waters ecoregion, while the summer feeding grounds of capelin *Mallotus villosus* moved westwards from 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.

[145] https://www.hafogvatn.is/en/about/mfri
[146] https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/IcelandicWatersEcoregion_EcosystemOverview.pdf

- 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).

Icelandic marine ecosystem

The main spawning grounds of exploited fish stocks in Iceland are in the south of the country while nursery grounds are off the north coast. The physical oceanographic character and faunal composition in the southern and western parts of the Icelandic marine ecosystem are different from those in the north and east. The former areas are more or less continuously bathed by warm and saline Atlantic water while the latter are more variable and influenced by Atlantic, Arctic and even Polar water masses. Mean annual primary production is higher in the Atlantic water than in the more variable waters north and east of Iceland, and higher closer to land than farther offshore. Similarly, zooplankton production is generally higher in the Atlantic water than in the waters north and east of Iceland.

In Iceland, Capelin *Mallotus villosus* is the most important pelagic stock and cod *Gadus morhua* is by far the most important demersal fish stock. Whales are an important component of the Icelandic marine ecosystem, and Icelandic waters are an important habitat for some of the largest seabird populations in the Northeast Atlantic. 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. The Icelandic marine ecosystem is highly sensitive to climate variations as demonstrated by abundance and distribution changes of many species during the warm period in the 1930s, the cold period in the late 1960s and warming observed during recent years.

A key factor driving fluctuations in Icelandic stocks is the availability of zooplankton which represent an important prey species for many species. The availability of sufficient zooplankton is considered to be an important factor which contributes to rates of larval mortality and research by the MFRI has shown a correlation between spring zooplankton levels and the abundance of cod fry the following August indicating interconnectivity between species at different trophic levels. Studies aimed at following the long-term trends in zooplankton abundance began around 1960 with recent years, 2013 – 2015, showing zooplankton abundances off North Iceland to be below historical averages[147].

Discards

Since 1996 discarding is prohibited and subject to penalty[148]. 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.

[147] http://www.hafro.is/Astand/2015/umhverfi_2015.pdf

[148] Act concerning the Treatment of Commercial Marine Stocks No. 57, 3 June 1996: http://eng.atvinnuvegaraduneyti.is/media/acts/Act-no-57-1996-Treatment-of-Commercial-Marine-Stocks.pdf

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 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.

Despite the discard prohibition, penalties and flexibility built into the system some discarding may still occur, likely mainly in the form of high grading. This is considered to be at low levels and can be detected by comparing landings and size compositions between vessels fishing in the same area. A program has been running since 2001 to do this, mainly focussing on cod and haddock but various other species have been sampled. The measurements are taken on board commercial vessels by trained inspectors[149].

Retained catch

With regards to retained catches, most commercially fished species in Iceland are now part of the ITQ system. Discarding of these commercially important species 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. Note that in Iceland observers are referred to as 'Inspectors' and unlike most observers have the authority to fine or charge the vessel with criminal charges. All fisheries are subject to observation but the extent of observer coverage varies, it is 1-2% on average (see Table 22 below) but there are some exceptions perceived higher risk fisheries, such as 3.64% in the gillnet fisheries and 100% coverage of purse seiners operating in the fjords. Discards are not included in Icelandic fisheries assessments as they are generally considered to be negligible; however, should the situation change and discards increase then these changes should be detectable within the system (as noted above).

Table 22. Directorate 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%

Landings of ling in the 2016/2017 season were 8,766 tonnes including 1,073 tonnes from foreign vessels[150]. Of the Icelandic catches roughly 59% was taken by longlines, 23% by demersal trawls, 8% by cod gillnets, 7% by *Nephrops* trawls and 2.4% by Danish seines. The remaining 0.4% was made up of handlines and monkfish nets (Figure 39). The status of those species comprising greater than 1% of overall catches in each of the main gears (those gears contributing >1% to total landings of ling) outlined above are listed in Table 23 and presented in detail below.

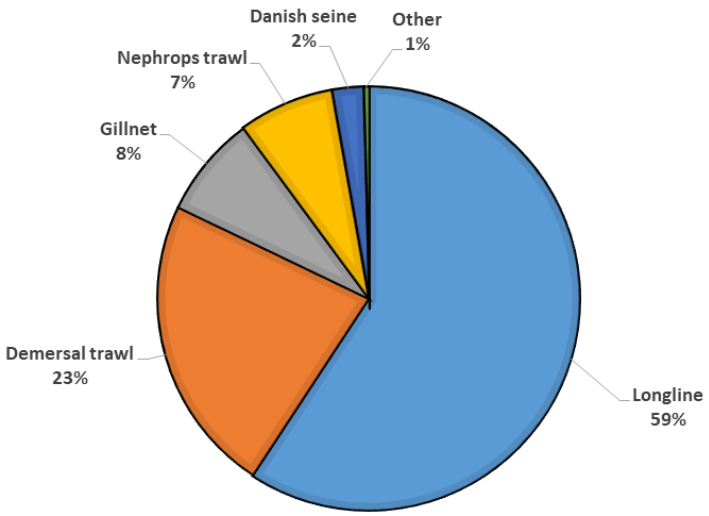

Figure 39. Proportion of total landings of ling by gear type during the 2016/2017 fishing season (Source: Fisheries Directorate: www.fiskistofa.is).

[149] Document extract provided by MRFI "Chapter 2. Sampling by the Marine Research Institute and others." Dated January 5, 2012.
[150] ICES (2018). ICES Advice on fishing opportunities, catch, and effort. Ling (*Molva molva*) in Division 5.a (Iceland grounds). Published 13 June 2018. http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/lin.27.5a.pdf

Table 23. Total catches and % contribution, by gear type, for species that represent >1% of the overall catch for the major gear types contributing >1% of total Icelandic landings of ling in the 2016/2017 fishing season (Source: Fisheries Directorate website: www.fiskistofa.is).

Gear type	Species	Total catches (t)	% Contribution to total catches by gear type
Longline	Cod	77,849	72.7
	Haddock	14,258	13.3
	Atlantic wolffish	4,561	4.3
	Ling	**4,331**	**4.0**
	Tusk	1,626	1.5
	Golden redfish	1,233	1.2
Demersal trawl	Cod	118,364	47.5
	Golden redfish	44,612	17.9
	Saithe	40,716	16.3
	Haddock	16,311	6.5
	Deep sea redfish	8,475	3.4
	Greenland halibut	7,979	3.2
	Greater argentine	3,515	1.4
	Ling	**1,674**	**0.7**
Cod gillnet	Cod	17,085	79.4
	Greenland halibut	1,842	8.6
	Saithe	1,447	6.7
	Ling	**567**	**2.6**
	Haddock	284	1.3
***Nephrops* trawl**	Cod	2,396	33.1
	Golden redfish	1,678	23.2
	Nephrops	1,119	15.5
	Ling	**532**	**7.3**
	Saithe	416	5.7
	Witch	300	4.1
	Megrim	219	3.0
	Anglerfish	220	3.0
	Haddock	133	1.8
	Atlantic wolffish	74	1.0
Danish seine	Cod	16,335	64.1
	Plaice	4,132	16.2
	Atlantic wolffish	1,261	4.9
	Lemon sole	886	3.5
	Saithe	808	3.2
	Witch	711	2.8
	Haddock	438	1.7
	Golden redfish	346	1.4
	Ling	**176**	**0.7**

These 15 species (ordered by total catches in the gears listed; cod, golden redfish, saithe, haddock, Greenland halibut, deep sea redfish, Atlantic wolffish, plaice, greater argentine, tusk, *Nephrops*, witch, lemon sole, anglerfish and megrim) constitute the major by-catch species in Icelandic ling fisheries. Further information on the status of these stocks is presented below[151].

Cod *Gadus morhua* (Icelandic: Þorskur)

Estimated spawning stock biomass (SSB) has increased in recent years and has not been larger in 50 years. Harvest rate has declined and is at its lowest value in the assessment period. Recruitment since 1988 is lower than the average recruitment in the period 1955–1985. The increase in SSB is therefore primarily the result of lower harvest rate. The 2013 year class is estimated to be small, but the sizes of the 2014 and 2015 year classes are near the long-term average.

[151] https://www.hafogvatn.is/en/harvesting-advice

The size of the reference stock is not expected to change markedly for the next three years as the 2015 year class, which enters the reference stock in 2019, is above the average of 1955–2017, 2016 year class is estimated to be somewhat below average and the 2017 year class around average. MFRI and ICES advise that when the Icelandic management plan is applied, catches in the fishing year 2018/2019 should be no more than 264,437 tonnes. Estimated SSB_{2018} (651,600 t) is well above MSY $B_{trigger}$ (220,000 t), B_{lim} (125,000 t) and B_{pa} (160,000 t).

Golden redfish *Sebastes norvegicus* (Icelandic: Gullkarfi)
The 2000–2005 year classes accounted for most of the catches in 2017. The 2008–2014 year classes are estimated to be below average. Fishing mortality has decreased in the past two decades but is above F_{MSY}. Spawning-stock biomass (SSB) has steadily increased for the past 20 years and is well above MSY $B_{trigger}$. MFRI and ICES advise that when the management plan is applied, catches in the fishing year 2018/2019 in the East Greenland/Iceland/Faroe Islands area should be no more than 43,600 tonnes. According to an agreement between Iceland and Greenland, 90% of the TAC is allocated to Iceland. In terms of future prospects, as noted the 2008–2014 year classes are estimated to be small. Both total biomass and SSB will decrease in 2018 and 2019 when these cohorts enter the fishery. Estimated SSB_{2018} (296,000 t) is well above MSY $B_{trigger}$ and B_{pa} (220,000 t) and B_{lim} (160,000 t).

Saithe *Pollachius virens* (Icelandic: Ufsi)
SSB is currently at the time-series maximum. The harvest rate has declined from 2009 and is presently estimated below HR_{MGT}. Recruitment in the last decade has been high. The reference biomass (B4+) has increased since 2015 due to the large 2012 cohort and the cohorts from 2013 and 2014 are estimated to be above average. MFRI and ICES advise that when the Icelandic management plan is applied, catches in the fishing year 2018/2019 should be no more than 79,092 tonnes. In terms of future prospects, stock size is not expected to change much in coming years. Estimated SSB_{2018} (232,883 t) is well above MSY $B_{trigger}$ (65,000 t), B_{lim} (44,000 t) and B_{pa} (61,000 t).

Haddock *Melanogrammus aeglefinus* (Icelandic: Ýsa)
SSB increased from 2001–2004, after several strong year classes, and was large until 2008. Since 2008, the SSB has decreased but in recent years has stabilised above MGT $B_{trigger}$. Harvest rate in 2015–2017 is estimated close to its lowest level in the assessment period and is currently close to HR_{MGT}. Recruitment of 2 year old haddock in 2010–2015 was low, but is estimated high for 2016 and close to average for the last two years. MFRI and ICES advise that when the Icelandic management plan is applied, catches in the fishing year 2018/2019 should be no more than 57,982 tonnes. In terms of future prospects, reference biomass will increase in 2017, as the 2014 cohort enters the reference stock. The 2015–2017 cohorts are estimated to be close to the long-term mean recruitment. Average weight of the 2014–2017 year classes is predicted to be above average in 2019. Estimated SSB_{2018} (89,479 t) is well above MGT $B_{trigger}$ (45,000 t), B_{lim} (45,000 t) and B_{pa} (59,000 t).

Greenland halibut *Reinhardtius hippoglossoides* (Icelandic: Grálúða)
The stock was well above MSY $B_{trigger}$ in the early part of the time-series. After dropping below the MSY $B_{trigger}$ in 2004 and 2005, it has steadily increased and is currently above MSY $B_{trigger}$. Fishing mortality has decreased in recent years, and is estimated to be close to F_{MSY}. MFRI and ICES advise that when the MSY approach is applied, catches in the 2018/2019 fishing year should be no more than 24,150 tonnes. According to an agreement between Iceland and Greenland, 56.4% of the TAC is allocated to Iceland. In terms of future prospects, the survey biomass estimates indicate that the harvestable biomass has been stable in recent years while recruitment has declined. It is therefore expected that the stock size will decline. Estimated biomass is currently above MSY $B_{trigger}$ (0.5 B_{MSY}) and B_{lim} (0.3 B_{MSY}).

Deep sea redfish/Demersal beaked redfish *Sebastes mentella* (Icelandic: Djúpkarfi)
Note: this refers to demersal beaked redfish *S. mentella* and not pelagic deep-sea redfish *S. mentella*.

The lack of abundance indices with a long time-series prevents analytical assessment of this species but an autumn survey biomass index (IS-SMH) conducted since 2000 is is used as the basis for scientific advice. The IS-SMH covers the area of the fishable stock in Icelandic waters. The IS-SMH biomass index declined from 2001–2003 and has since been fluctuating without a trend. Catches in the past five years have been the lowest since 1980. In terms of future prospects, limited information is available on stock productivity of demersal beaked redfish. However, the abundance index of fish <30 cm has been at low levels since 2007, indicating little recruitment. MFRI and ICES advise that when the precautionary approach is applied, catches in the fishing year 2018/2019 should be no more than 13,012 t.

Atlantic wolffish *Anarhichas lupus* (Icelandic: Steinbítur)
Fishing mortality has been below F_{MSY} since 2014. Recruitment has been low since 2006, as compared to the two preceding decades. Harvestable biomass declined from 2006–2013 but has increased since then and is now close to the highest level in the assessment history. MFRI advises that when the MSY approach is applied, catches in the fishing year 2018/2019 should be no more than 9,020 tonnes. MFRI recommends a continued closure of the spawning area off West Iceland during the spawning and incubation season in autumn and winter. In terms of future prospects, recruitment has been low since 2006, compared to the years 1988–2005. Therefore, the size of the harvestable stock is not expected to increase in coming years.

Plaice *Pleuronectes platessa* (Icelandic: Skarkoli)
The harvestable biomass has increased since 2000 and has never been larger in the assessment period 1991–2017. Fishing mortality has declined since 1997 and has been around F_{MSY} since 2011. Recruitment has been stable since 1994. MFRI advises that when the MSY approach is applied, catches in the fishing year 2018/2019 should be no more than 7,132 tonnes. In addition, the MFRI recommends that regulations regarding area closures on spawning grounds remain in effect. Considerable uncertainty is present in the assessment due to a lack of recruitment data, but given little changes in recruitment the stock size is likely to remain stable over the next years.

Greater Argentine/Greater silver smelt *Argentina silus* (Icelandic: Gulllax)
The survey index has been high since 2014, but has fluctuated greatly. The F_{proxy} has decreased since 2010 and has been below the target F_{proxy} since 2014. MFRI and ICES advise that when the precautionary approach is applied, catches in the fishing year 2018/2019 should be no more than 7,603 tonnes.

Tusk *Brosme brosme* (Icelandic: Keila)
Recruitment in 2012-2015 was low, but has increased since then. Harvest rate has declined in recent years and is below HR_{MGT}. SSB has increased in recent years while the reference biomass (tusk >40 cm) has declined but remains at a high level. MFRI and ICES advise that when the Icelandic management plan is applied, catches in the fishing year 2018/2019 should be no more than 3,776 mt. In addition, continued closure of the nursery areas off the southeast and southern coast should be maintained. In terms of future prospects, the SSB and harvestable biomass will not increase in the near future, due to low recruitment in 2012–2015 and catch levels will likely be set at a similar level as current advice. Estimated SSB_{2018} is 14,017 mt and is currently well above SSB_{MGT} (6,240 mt), MSY $B_{trigger}$ (6,420 mt), B_{pa} (6,420 mt) and B_{lim} (4,460 mt).

Norway lobster/Nephrops *Nephrops norvegicus* (Icelandic: Humar)
Fishing mortality has been low in recent years and is still below F_{MSY}. Recruitment has decreased since 2005 and has never been lower. Harvestable biomass has decreased sharply and is at its lowest level at 7,780 tonnes. The biomass of large specimens is high but has decreased since 2009. MFRI advises that when the MSY approach is applied, catches in the fishing year 2017/2018 should be no more than 1,150 tonnes. In terms of future prospects, recruitment has been decreasing since 2005 which will lead to further decreases in the recommended TAC in coming years.

Witch *Glyptocephalus cynoglossus* (Icelandic: Langlúra)
The biomass index has been high since 2004. The recruitment index has, however, declined since 2009, and reached an all-time low in 2016. F_{proxy} has remained relatively low and stable over the last six years. MFRI advises that when the precautionary approach is applied, catches in the 2018/2019 fishing year should be no more than 1,100 tonnes. In terms of future prospects, the stock biomass index indicates that the witch stock was relatively large from 2004 and onwards. Low recruitment in recent years might lead to a decline in the stock in near future.

Lemon sole *Microstomus kitt* (Icelandic: Þykkvalúra)
The biomass index has been relatively high but variable since 2003 compared to the period 1992–2002. F_{proxy} has been highly variable for two decades. The recruitment index has been high since 2002. MFRI advises that when the precautionary approach is applied, catches in the fishing year 2018/2019 should be no more than 1565 tonnes. In terms of future prospects, the recruitment index has been above average in recent years, and it is therefore considered likely that the stock biomass will remain stable or increase.

Anglerfish/Monkfish *Lophius piscatorius* (Icelandic: Skötuselur)
The biomass index was high in 2005–2011 compared to previous years, but has since then decreased substantially. Juvenile indices show strong recruitment for year classes 1998–2007, but poor recruitment before and after this period. F_{proxy} was stable when the stock peaked, but has decreased in recent years and is now lower than the target. MFRI advises that when the precautionary approach is applied, catches in the fishing year 2018/2019 should be no more than 722 tonnes. In terms of future prospects, recommended catch levels have declined in recent years and will remain low in coming years.

Megrim *Lepidorhombus whiffiagonis* (Icelandic: Stórkjafta)
The recruitment index declined rapidly between 1989 and 1994. It stayed low until 1999, after which it increased and remained high until 2012 when it declined rapidly again and was very low in 2016. The biomass index has for the most part followed fluctuations in the recruitment index, but has remained high since 2006. MFRI does not advise a TAC for megrim for the 2018/2019 fishing year. In terms of future prospects, decline in the stock is to be expected, due to low recruitment as observed in the recruitment index in recent years

Vulnerable species Interactions
The discard prohibition only applies to commercially important species (and protected species including Atlantic halibut *Hippoglossus hippoglossus*[152] and porbeagle (*Lamna nasus*), basking shark (*Cetorhinus maximus*) and spiny dogfish/spurdog *Squalus acanthias*[153] unless they are captured alive in which case they must be released) and systematic recording of non-commercial by-catch has not occurred. Table 24Table 24 Table 24provides a summary of the fishery dependent and independent monitoring undertaken in Iceland.

Table 24. Sampling in the MFRI database covering commercial catches and surveys (Source: document extract provided by MRFI "Chapter 2. Sampling by the Marine Research Institute and others." Dated January 5, 2012).

Sample group	MRI-code	Description
Inspectors	1	Commercial catches, port and onboard
MRI	2	Commercial samples from ports
Fishermen	4	Sampling done on board vessels by crew
Discard samples	8	Monitoring of discards by inspectors
Survey on a commercial vessel	20	Survey on a rented vessel, example: flatfish survey in Faxaflói
March survey	30	Trawl survey, goes down to 500m
Shrimp survey	31	Trawl survey off North Iceland
Gillnet survey	34	Targets spawning cod, but other species are caught
October survey	35	Trawl survey, goes down to 1500m
Shrimp survey (Inshore)	37	Trawl survey in infjords area off West and North Iceland
Nephrops survey	38	Sledge survey off the South and West coast off Iceland

Until recently the observer programme has only covered commercial species and similarly the sampling by MRI, fishers and the MRV survey using a commercial vessel (for example, the 'Flóarall' or 'Flaxabay' survey) are focussed on commercial species. However, measures have been taken in recent years to extend the observer programme to cover by-catch such as elasmobranchs (pers. comm. MFRI, site visit) and records for by-catch species including skate *Dipturus batis*, Atlantic halibut, dogfish, Greenland shark *Somniosus microcephalus* and porbeagle *Lamna nasus* can be seen in the catch data available via the Fisheries Directorate website (http://www.fiskistofa.is/english/quotas-and-catches/). These are vulnerable or endangered, threatened or protected (ETP) species. Annual landing statistics for these five species are presented in Table 25 and the current status of each is discussed below.

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

Table 25. Icelandic landings to the nearest tonne of common skate, Atlantic halibut, spiny dogfish and Greenland shark in Icelandic fishing year (1 September – 31 August).

Species	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017
Common skate	127	138	153	233	141	157	133
Atlantic halibut	595	186	39	62	55	118	114
Spiny dogfish	65	50	14	11	14	13	3
Greenland shark	27	14	9	62	22	29	18
Porbeagle	1	1	1	1	0	1	1

Common skate/grey skate *Dipturus batis* (Icelandic: Skata)

The grey skate used to be fairly common in Icelandic waters, but has been overfished as catches are now only about 10% of catches 50 years ago. The status of the grey skate stock can be compared to the halibut stock as both species are at a low level. Both are widely distributed, fished in many types of fishing gear, very large and mature late. Total landings of grey skate in the 2016/2017 fishing season in Icelandic waters was 133 tonnes. No assessment is carried out for grey skate and indices of abundance are uncertain as only limited survey data exists. However, trends in total numbers in the groundfish survey indicate some increase (Figure 40).

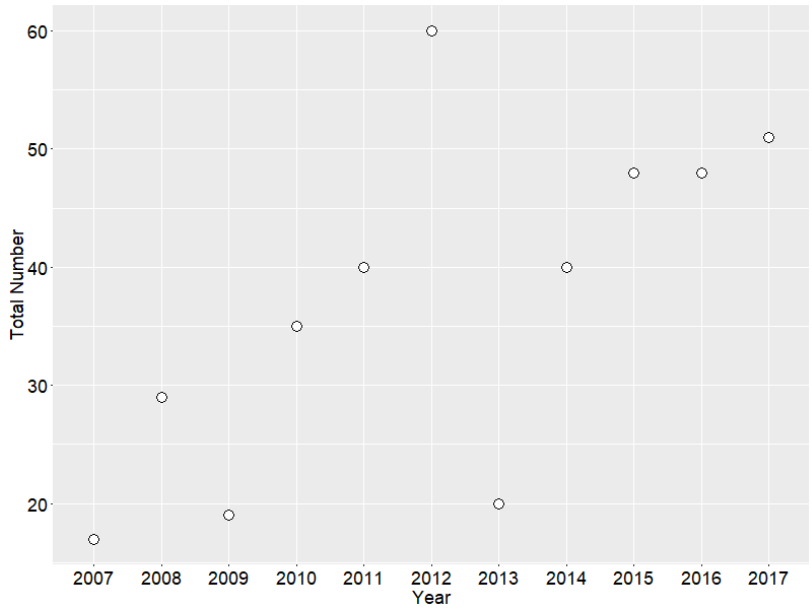

Figure 40. Grey skate *Dipturus batis* in MFRI spring survey. Total catch in numbers (Source: MRFI data provided to assessment team).

Atlantic halibut *Hippoglossus hippoglossus* (Icelandic: Lúða)

Recruitment and biomass indices decreased rapidly between 1985 and 1992 and have remained low since. Survey catches of Atlantic halibut have predominantly been 3 – 5 year old immature fish. These age groups have been in decline for over 20 years, and it is evident that the stock has suffered a recruitment failure. It is therefore likely that the stock will remain low over the next years.

In 2012, a regulation was issued to ban all targeted fishing for Atlantic halibut and stipulating that all viable halibut must be released in other fisheries[154]. The effects of this are evidenced by a sharp drop in halibut landings after 2011 (Table 25). MRI recommends that these regulations should be maintained until clear indications of improvement in the stock are evident. Total landings in the 2016/2017 fishing season amounted to 114 t. The biomass index shows some increase in recent years.

Spiny dogfish/spurdog *Squalus acanthias* (Icelandic: Háfur)

A few hundred tonnes of spiny dogfishes were fished annually by foreign fleets when they operated in Icelandic waters. However, Icelandic catches have always been low, in 2016/2017 they amounted to 3t. As spiny dogfish are an aggregating species, landings may be dominated by relatively few large hauls leading to large fluctuations in annual landings and/or survey results. They are an infrequent catch in research surveys and so no assessment is carried out.

[154] Regulation 470/2012. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302

Indices of abundance are uncertain because of limited data. In 2017, a regulation was issued to ban all targeted fishing for spiny dogfish and stipulating that all viable specimens must be released in other fisheries and dead specimens landed as VS catch [155].

Greenland shark *Somniosus microcephalus* (Icelandic: Hákarl)
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 it is a periodic by-catch in bottom trawl fisheries. National landings in 2016/17 totalled 18 tonnes with no specific changes or trends apparent in the annual landings data (MRI data provided to assessment team). Stock status is unknown.

Porbeagle *Lamna nasus* (Icelandic: Hámeri)
Icelandic landings of porbeagle are very low, amounting to about 1 tonne a year or less. There are no directed fisheries for porbeagle so landings are as by-catch. The northeast Atlantic population as a whole has been historically heavily exploited by longline fisheries, principally by Denmark, France, Norway and Spain and it has been classed as vulnerable on the IUCN Red List. The International Commission for the Conservation of Atlantic Tunas (ICCAT) last undertook an assessment of the Northeast Atlantic stock in 2009. They noted considerable uncertainty in identifying stock status relative to virgin biomass. Exploratory assessments indicate it is below B_{MSY}[156]. A joint ICCAT/ICES stock assessment is scheduled for 2019. ICES advise that fishing mortality should be minimised and no targeted fisheries should be permitted. Within EU waters there has been no TAC since 2010[157]. In 2017, a regulation was issued to ban all targeted fishing for porbeagle and stipulating that all viable specimens must be released in other fisheries and dead specimens landed as VS catch[158].

There is a system of area closures in operation in Iceland, comprising real time, permanent and temporary closures which can protect vulnerable species or life stages of fish. Real time area closures have been in operation since 1976 to protect juvenile/small fish. Fishing is prohibited for at least two weeks in areas where the number of small fish in the catches has been observed by inspectors to exceed a certain percentage and if, in a given area, there are several consecutive closures the Minister of Fisheries can issue regulations that close the area for a longer period. Inspectors from the Directorate of Fisheries supervise these closures in collaboration with MFRI. In 2017 there were 119 real-time area closures, less than the 148 in 2016 (pers. comm. Icelandic Coastguard, site visit).

In addition to the real time closures, there are also permanent and temporary area closures in place to protect juveniles (Figure 41). Temporary closures of the major spawning grounds of cod, plaice and wolfish reduce fishing during the main spawning period of these species.

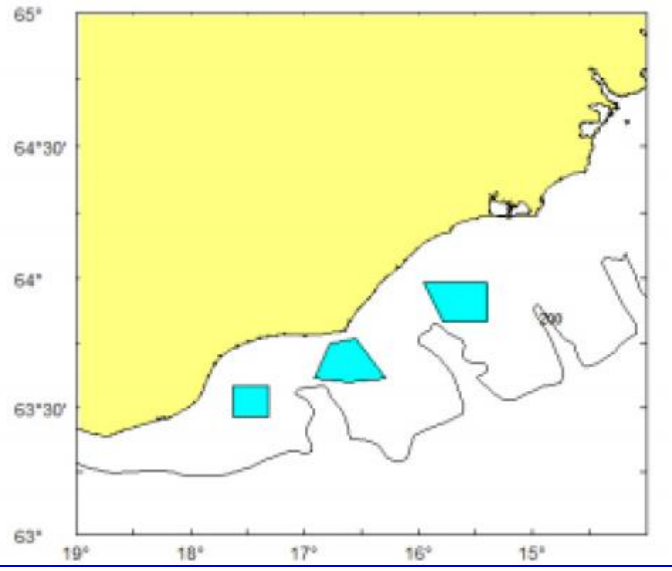

Figure 41. Areas closed to longlines for protection of juvenile tusk (Source: Information provided to assessment team by MFRI).

[155] Regulation 456/2017. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017
[156] https://www.iccat.int/Documents/SCRS/ExecSum/SHK_ENG.pdf
[157] ICES. 2017. Report of the Working Group on Elasmobranchs (2017), 31 May-7 June 2017, Lisbon, Portugal. ICES CM 2017/ACOM:16. 1018 pp
[158] Regulation 456/2017. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017

Interactions of fishing gear with benthic ecosystems

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 ling by the Icelandic fleet in the 2016/2017 fishing season, 59% was taken by longlines, 23% by demersal trawls, 8% by gillnets, 7% by *Nephrops* trawls and 2.4% by Danish seines. Icelandic groundfish fisheries are multispecies in nature and as such the effects of bottom contact fishing gears are not separable by species.

The most widely used bottom fishing gear in Icelandic waters are demersal trawls the effects of which are dependent on seabed and community type. 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. Available data on fishing effort are very accurate and have made it possible to map in detail the distribution of bottom trawl effort (Figure 42). The reduction in the intensity and footprint of the bottom trawl fishery in recent years is also evidenced by a reduction in total fishing effort (Figure 43).

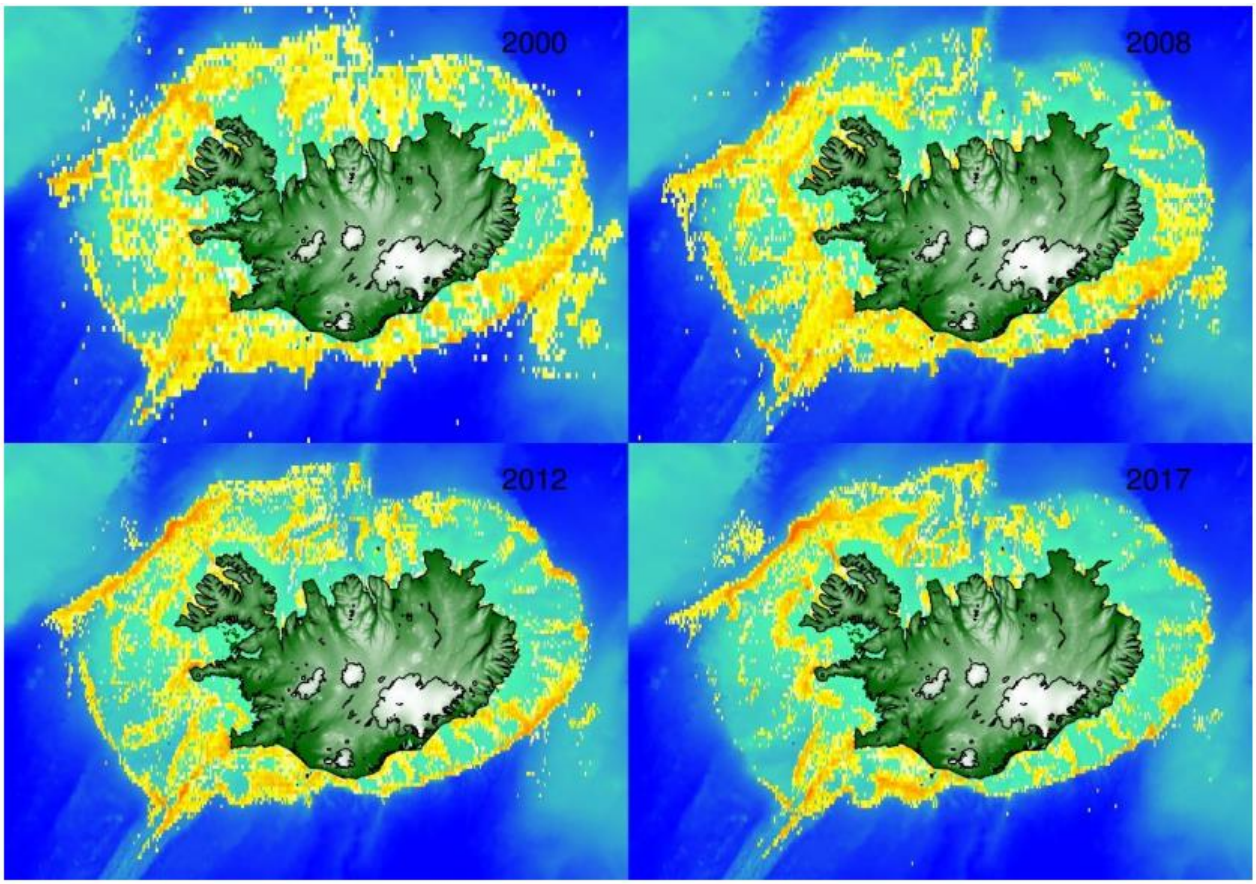

Figure 42. Spatial distribution of bottom-trawl effort based on logbooks from trawl fisheries targeting demersal fish, shrimp and Norway lobster (Source: MFRI State of Marine Stocks and Advice, 2018).

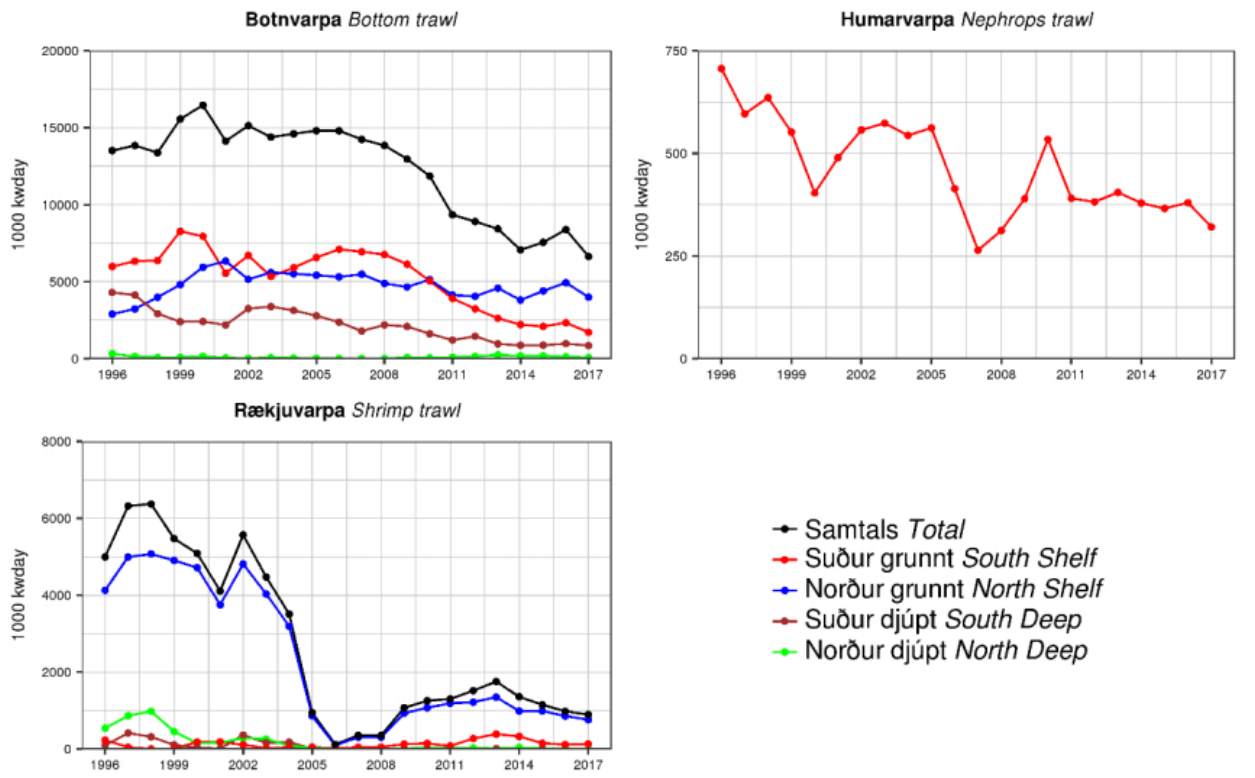

Figure 43. Annual total bottom-trawl fishing effort (1000 kW days) based on logbooks from trawl fishery targeting a) demersal fish, b) Norway lobster and c) shrimp in the Icelandic ecoregion since 1996 (Source: MFRI State of Marine Stocks and Advice, 2018).

Protection of Vulnerable Marine Ecosystems (VMEs)

It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs), from significant adverse impact from bottom-contacting fishing gear. As a result of this policy, large areas of Icelandic waters are closed, 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 fishing. Furthermore, not all the fishable shelf areas outside closed areas are trawlable, as some parts of the seabed are unsuitable for trawl gear. The 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.

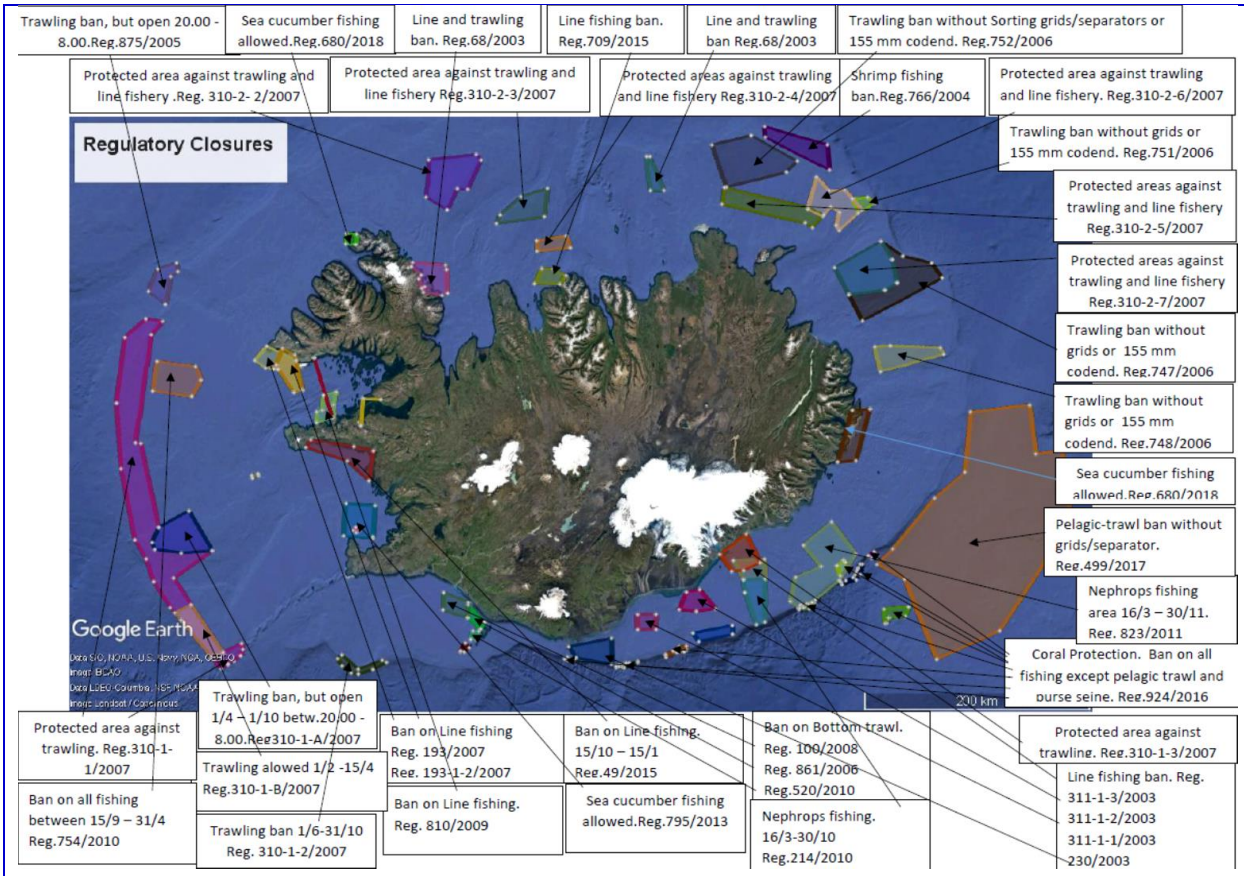

Figure 44. Regulatory Closures in Icelandic waters as of November 2018.

Seabed mapping is a key aspect of this policy and is the remit of the MFRI. 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. Vulnerable habitats according to FAO, OSPAR and ICES, are identified when observed (MFRI, site visits Nov. 2018, pers. comm). Data on VMEs is gathered from trawl survey by-catch and also video mapping[159]. For example, during the summer of 2017 a 9-day habitat mapping cruise was conducted including a total 61 dives in four areas; more information can be found online[160]. 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[161]. 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. The project most recently met 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:

1. 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 Figure 45.
2. Produce a VME distribution map for the larger study area based on the habitat suitability model and environmental settings.
3. Produce fishing pressure map based on trawling data for the larger area.
4. Making impact estimates based on GIS analysis of overlap between the VME distribution and fishing intensity.

[159] Appendix E. http://novasarc.hafogvatn.is/docs/NovasArc_report_workshop_4.pdf
[160] https://hafsbotninn.wordpress.com
[161] http://novasarc.hafogvatn.is/

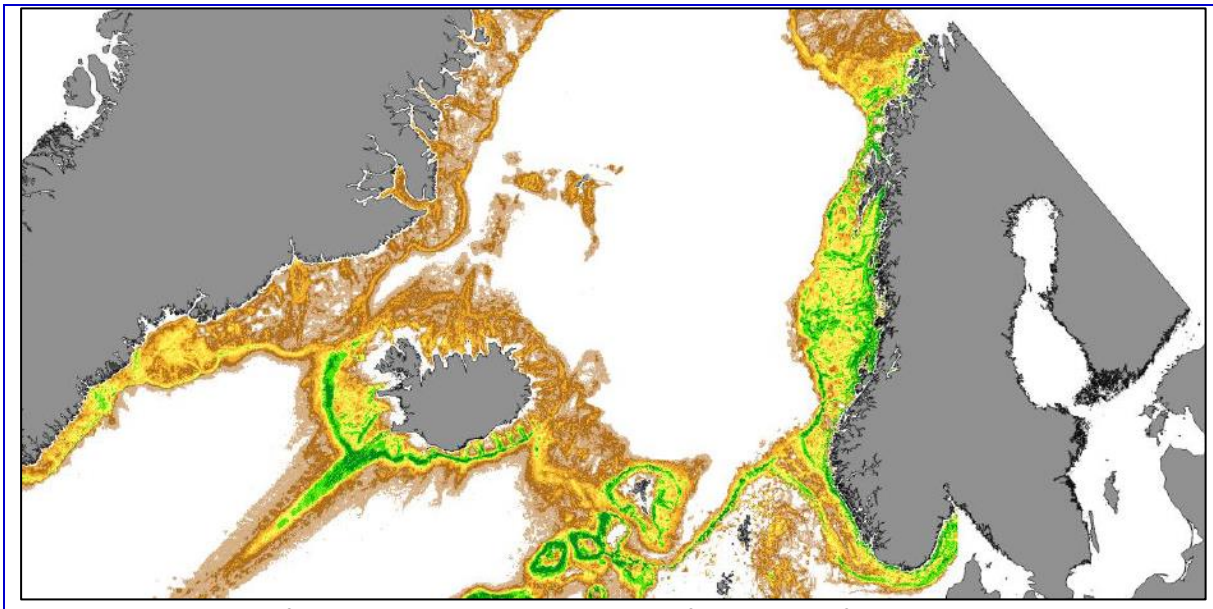

Figure 45. Distribution of the VME shallow sea pen based on first test run of the habitat suitability model. Green is 1 and white is zero probability of occurrence (Source: Report of NovasArc workshop, Tórshavn, Faroes, November 20-24, 2017[162]).

VMEs of particular importance within Icelandic waters are sponge, sea-pen and cold-water coral communities and hydrothermal vent areas and further information on these communities and habitats is provided below.

Sponge aggregations

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[163].

By-catch of sponges are recorded during bi-annual ground fish 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

Information continues to be collected to ensure vulnerable areas that overlap with fishing effort are identified. This comes from MFRI research programme, ground fish survey, fishing industry and observers.

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[164].

[162] http://novasarc.hafogvatn.is/docs/NovasArc_report_workshop_4.pdf
[163] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2005/may/Iceland%20and%20East%20Greenland.pdf
[164] http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WGDEC/wgdec_2017.pdf

Cold-water coral reef

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 to the southeast of Iceland were permanently closed to fishing (Figure 46Figure 46).

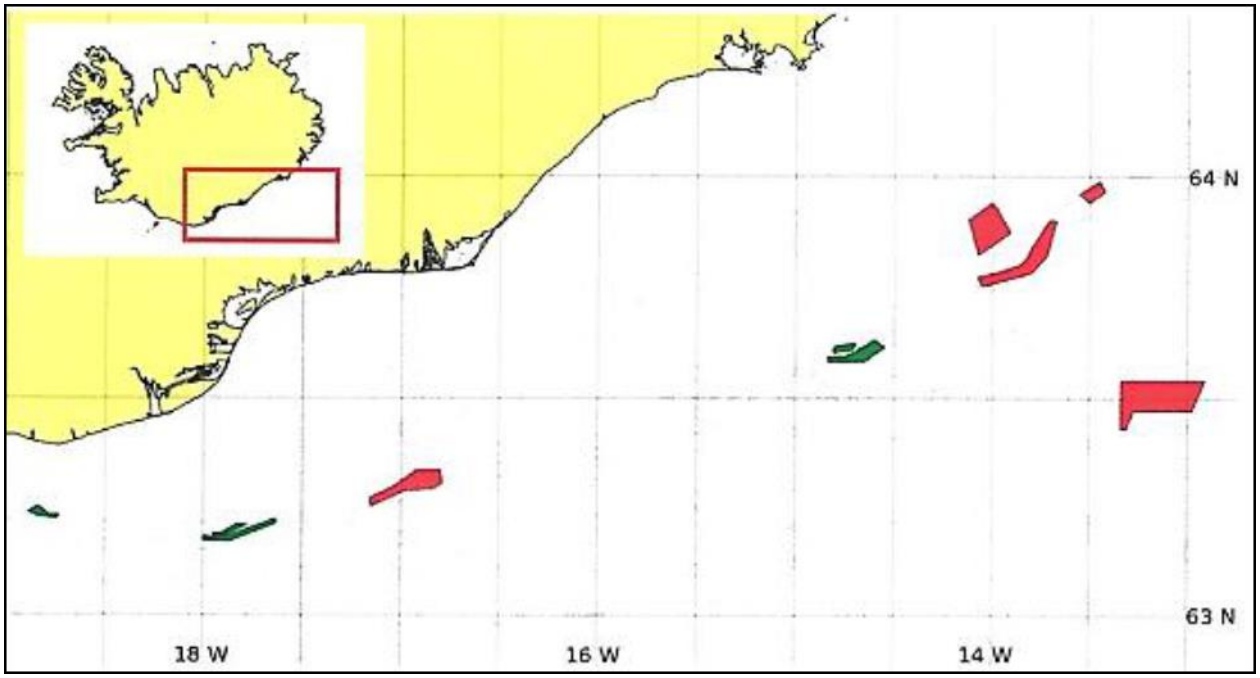

Figure 46. Location of closed areas for the protection of cold water corals in water to the southeast of Iceland**,** current as of November 2018. Maps can be viewed by downloading Google Earth and clicking on the following .kml file produced by the Directorate of Fisheries http://uv.fiskistofa.is/uv.kml.

Hydrothermal vent areas

There are two known hydrothermal vent areas with a series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island (see Figure 47 below) and are fully protected under the Nature Conservation Act (Notice No.'s 249/2001[165] and 510/2007[166]). Further information on these closures and their protections can be found on the Environment Agency of Iceland website[167]. 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 considered threatened by fishing activities.

[165] https://www.stjornartidindi.is/Advert.aspx?RecordID=6e1cf8c7-d6de-449f-8924-a9627265c8cb
[166] https://www.stjornartidindi.is/Advert.aspx?RecordID=df0afbbe-e2b5-4b5e-887b-15fb83bf0f2e
[167] https://www.ust.is/einstaklingar/nattura/fridlyst-svaedi/nordurland-eystra/hverastrytur-i-eyjafirdi/

Figure 47. Coordinates and location of protected natural resources (i.e. hydrothermal vent) at Arnarnesstrýtur in Eyjafjörður north of the Arnarnes river (source: Environment Agency of Iceland[168]).

Interactions with Seabirds and Marine Mammals

By-catch of marine mammals and seabirds in Icelandic waters has not been systematically investigated until recently. Pálsson *et al*. (2015)[169] reviewed data from logbooks and on-board observers and found that reports of seabird and marine mammal by-catch were few in all gear types with the exception of gillnets (see also Table 26 below). Similar findings were made in by-catch monitoring undertaken by the MFRI in 2016 in the lumpsucker gillnet (57 trips/days), cod gillnet (60 trips/days), demersal trawl (61 trips/780 days), monkfish gillnet (3 trips/days) and longline fisheries (72 trips/ 230 days) within the Icelandic EEZ (see table below)[170]. Aside from gillnets, by-catch of seabirds and marine mammals in the major gear used to target ling (i.e. longlines and bottom trawls) is likely to be relatively small. The effects of longlines, bottom trawls and gillnets on marine mammals and seabirds are discussed below.

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

[168] https://www.ust.is/library/Skrar/Einstaklingar/Fridlyst-svaedi/Auglysingar/Hverastrytur_Arnarnesnofum_kort.pdf

[169] Pálsson, O. K., Gunnlaugsson, Þ. and Ólafsdóttir, D. (2015). By-catch of sea birds and marine mammals in Icelandic fisheries. MRI, 2015. https://www.hafogvatn.is/static/research/files/fjolrit-178pdf

[170] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf

Iceland Sea	Marine mammal	27.5.a	Bottom trawls	*Hallchoerus 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	*Hallchoerus 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

In relation to the quality of by-catch data, it is important to note that observers cover all gear types (approximately 1% coverage in all fisheries) but the sampling is not focused on documenting seabird and marine mammal by-catch. Most attention to seabird and marine mammal by-catch is paid in the gillnet fisheries, where most of the by-catch is assumed. Less information is available from other fishing gears. It is also important to note that even where observers are present they are not always in a position to document any by-catch. For instance, in the pelagic pair trawl fishery, observers are below deck to monitor the catch, and not in a position to see if a seabird or marine mammal is caught[171]. Since 2014, this has improved with stricter guidelines regarding marine mammal by-catch and supervision of the observers. Prior to this the observer data on marine mammal by-catch is not considered reliable.

Further, fishers are required to report the incidental catch of marine mammals and seabirds and the electronic logbook system allows for these animals to be recorded along with normal catch. As of February 2014, all interactions between fishing gears and marine mammals/seabirds including the number and species of the animal in question must be reported[172]. However, following the implementation of the new electronic logbook system in 2010 there was a reduction in by-catch records and there are indications that by-catch is not being reported or is being under-reported. In the lumpsucker gillnet fishery MRFI noted by-catch rates were 5 times higher when an inspector was present in 2014-2016 than when they were absent. In 2017, reported by-catch by the lumpsucker fleet has increased, which suggests better compliance, but overall by-catch rates are still much lower than observed in trips by the inspectors[173]. It is not clear how representative this compliance rate is of other Icelandic fisheries. 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[174].

A smartphone app is in development by the Directorate of Fisheries, which is intended to make both the 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 first 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 the legal framework. Further, the Icelandic ministry of Industry and Innovation has recently created a Committee for Consultation on Responsible Management of Living Marine Resources which has a specific remit to address bycatch in the gillnet fisheries for lumpfish and cod and in particular data recording, data availability and reliability and propose management measures to reduce bycatch (see Appendix 3).

Seabird interactions

Pálsson *et al*., (2015)[175] reported that sea birds are occasionally attracted to the baited hooks in longline fisheries. As noted above a relatively small level of interaction was recorded with seabirds in the MFRI's 2016 by-catch monitoring of longline vessels, 11 northern fulmar *Fulmarus glacialis*. The low level of seabird interactions in Icelandic longline fisheries is at least in part due to longliners' use of bird scaring devices, such as acoustic cannons and tori lines, and night setting in an effort to minimise interactions between seabirds and their gear. Northern fulmar is listed as 'of least concern' on the IUCN Red List.

[171] 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

[172] http://www.reglugerd.is/interpro/dkm/WebGuard.nsf/key2/557-2007

[173] MRFI (2018). By-catch of seabirds and marine mammals in lumpsucker gillnets 2014-2017. https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

[174] 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

[175] Pálsson, O. K., Gunnlaugsson, Þ. and Ólafsdóttir, D. (2015). By-catch of sea birds and marine mammals in Icelandic fisheries. MRI, 2015. https://www.hafogvatn.is/static/research/files/fjolrit-178pdf

Pálsson *et al.*, (2015) did not record any observations of seabirds in the bottom trawl fishery and none were recorded in MFRI's 2016 by-catch monitoring.

Pálsson *et al*. (2015) used data from the annual MFRI cod gill net survey, which mimics fleet effort and represents approx. 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 dominated by common murre/guillemot *Uria aalge* (330 birds representing 72% of total bird by-catch in the survey) and northern fulmar *Fulmarus glacialis* (50 birds representing 19% of total bird by-catch) (Table 27). The common guillemot has a European population of between 2 and 3 million individuals and northern fulmar has a European population of between 7 and 8 million individuals. If the catch rate observed in the gill net survey was multiplied to total fleet effort this would represent about 0.66% and 0.03% of their respective populations. Although both populations are very large, both species have been experiencing rapid declines to the extent that common guillemot have been classed as 'near threatened' by the IUCN Red List and norther fulmar as 'endangered'. The MFRI's 2016 by-catch monitoring also found common guillemot and northern fulmar to be the most frequently caught seabirds in gillnets but also found high catches of eider *Somateria mollissima* and black guillemot *Cepphus grille*. European populations for these species are 1.6 and 2 million individuals for eider and 300,000 and 700,000 individuals for black guillemot. Both populations are considered to be decreasing. Eider is listed as vulnerable by the IUCN Red List, while black guillemot is listed as of least concern. Gillnets are not a major contributor to ling catches, accounting for 8% in the 2016/2017 fishing year.

Table 27. Recorded numbers of marine mammals and sea birds in gill nets. a) MFRI cod gill net survey (SMN), sea birds 2009-2014 (Source: Pálsson *et al.*, 2015[176]).

Sjófuglar *Sea birds*		a) Netarall *Gill net survey*	
Tegund *Species*	Vísindaheiti *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

The other seabird species reported in the fishing gears used in the ling fishery are listed as species of least concern on the IUCN Red List, with the exception of Atlantic puffin *Fratercula arctica*, great northern diver *Gavia immer* and long-tailed duck *Clangula hyemalis*, which are listed as vulnerable and razorbill *Alca* torda, listed as near threatened. Trends in the populations of seabird species around Iceland are thought to primarily result from fluctuations in food availability. Given the numbers of seabirds caught compared to the overall populations and the level of natural variation in seabird populations as a result of environmental drivers it is unlikely that Icelandic ling fisheries are having significant negative impacts on any seabird species.

Marine mammal interactions

The three main marine mammal species bycaught in Icelandic fisheries are harbour porpoises *Phocoena phocoena*, harbour seals *Phoca vitulina* and grey seals *Halichoerus grypus*. While the majority of marine mammal by-catches occur in gillnet fisheries there are also incidences of seal by-catches in bottom trawls; Pálsson *et al.*, (2015) did not report any incidences of marine mammal by-catches in Icelandic longline fisheries. By-catches of marine mammals in Icelandic fisheries have generally been decreasing in line with a decrease in gillnet effort (Figure 48). As noted previously, gillnets are not a major contributor to ling catches, accounting for 8% in 2016/2017.

[176] Ibid.

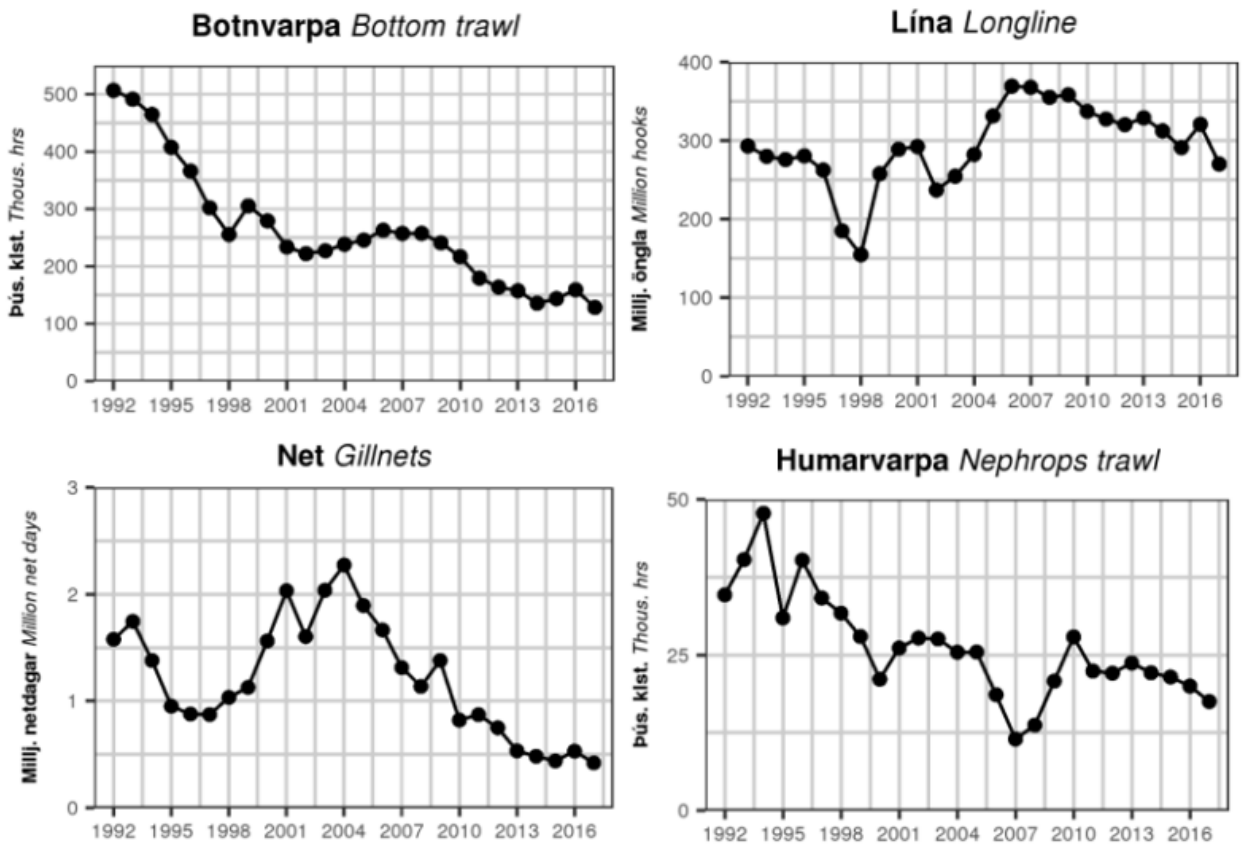

Figure 48. Temporal trends in effort by gear type since 1992 based on Icelandic fishing vessel logbooks (lumpsucker nets excluded in gillnets effort) (Source: MFRI State of Marine Stocks and Advice, 2018[177])

Seals

Only 2 species of seals are native to Iceland, grey seals and harbour seals. Greenland or harp seals *Phagophilus groenlandicus*, ringed seals *Phoca hispida*, and hooded seals *Cystophora cristata* are frequent visitors in the winter, while bearded seals *Erignathus barbatus* and walruses *Odobenus rosmarus* are rarer.

Harbour seal

In 1980, when the first aerial population census was undertaken, the abundance of harbour seals was estimated at around 33,000 animals but the population has declined rapidly and in the most recent census, undertaken in 2016, the population was estimated at 7,652 seals (95% confidence intervals of approximately 5,000 – 10,000)[178] (Figure 49). This represents a decline of 77% on the 1980 population estimate and is 32% smaller than the last complete census in 2011. The government set a management objective in 2006, requiring that the population should be no less than 12,000 animals and that management action should be initiated if the population drops appreciably below the objective. The population is now well below this number.

[177] https://www.hafogvatn.is/static/files/Veidiradgjof/2018/vistkerfi_2018.pdf

[178] Þorbjörnsson *et al.*, 2017. Aerial census of the Icelandic harbour seal (*Phoca vitulina*) population in 2016: Population estimate, trends. https://www.hafogvatn.is/static/research/files/hv2017-009pdf

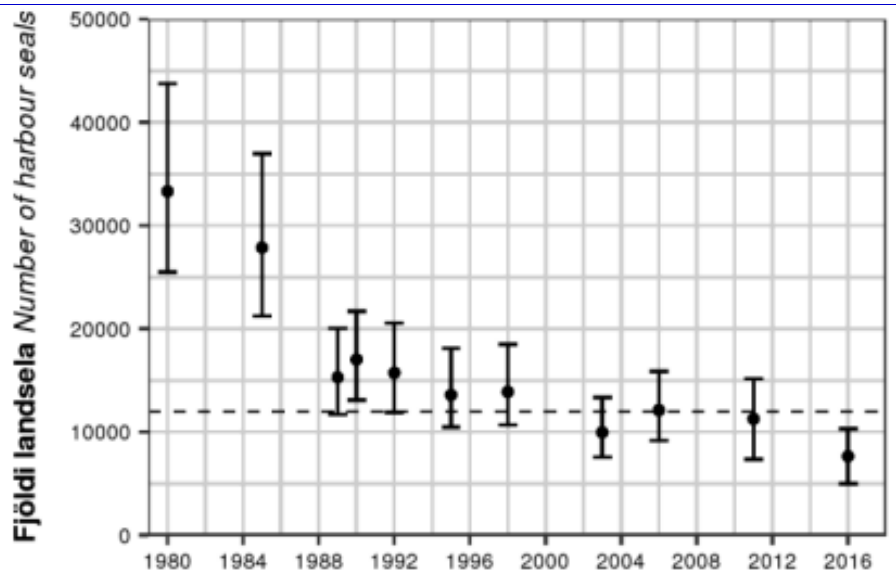

Figure 49. Harbour seal stock size with 95% confidence intervals. The broken line indicates the management objective (Source: MFRI State of Marine Stocks and Advice, 2017[179]).

In response to the rapid decline, NAMMCO has recommended that Iceland conduct more regular monitoring of the population and also increase research on other ecological parameters regarding the Icelandic pinniped populations. The current aim is to conduct aerial surveys to produce population estimates every other year and the next census is due to be undertaken in 2018. Further, an advisory management plan for the Icelandic harbour seal population is being considered. This includes a re-evaluation of the current target population level objective, outlining of the frequency of censuses, development of a reporting system for seal hunting and increased effort in by-catch data collection[180]. MFRI has provided advice to the Ministry "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."[181]

The factors contributing to the decline of the Icelandic harbour seal population are poorly understood. Hunting and by-catch have been mentioned as probable population limiting factors but data to quantify the magnitude of affected animals is scarce and unreliable. Although traditional sealing is considered to have ceased to a large extent, culling around river mouths to reduce the effect that seals are thought to have on salmon fisheries is still considered to be common. In relation to by-catch, harbour seals are most frequently caught in lumpsucker, and to a much lesser extent, cod gillnet fisheries.

As reporting of by-catch is considered unreliable estimates are based upon records of by-catch from observers from the Directorate of Fisheries on-board commercial fishing vessels targeting lumpfish (covering 1-2% of fishing trips), and from the MFRI during their annual research cod gill net survey. By-catch is estimated by raising the observed by-catch with total fleet effort. Estimates for the years 2014-2016 are presented in Table 28. The harbour seal by-catch estimate across all gears amounts to 3-19% of the latest harbour seal estimate of 7,652 animals but as noted previously the vast majority of this by-catch (90-100%) is from the lumpsucker gillnet fishery which does not catch ling. MFRI note that there is a considerable annual variation in by-catch of marine mammals. Although the same three species of marine mammals are the most frequently caught in all years, the numbers caught vary substantially between years. This results in a very high coefficient of variation and therefore in a high estimate of by-catch. The most likely factors explaining this are inadequate sampling, spatial/temporal mismatch in sampling, and the nature of by-catch events, with some species like grey seals characterized by few, severe events[182].

[179] MFRI State of Marine Stocks and Advice, 2017. https://www.hafogvatn.is/static/extras/images/Landselur277.pdf
[180] 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
[181] MFRI State of Marine Stocks and Advice, 2017. https://www.hafogvatn.is/static/extras/images/Landselur277.pdf
[182] MRFI (2018b). By-catch of seabirds and marine mammals in lumpsucker gillnets 2014-2017. https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

Table 28. 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[183]).

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

Grey seal

The abundance of grey seals was estimated between 7,000 – 10,000 animals in the period 1982 – 1992. Abundance has since declined and was estimated at around 6000 animals in 1995 – 2008. The last survey in 2012 estimated the abundance around 4,200 animals (95% confidence intervals of 3,400 – 5,000). This estimate is slightly above the management objective of 4,100 animals set by the government.

As with harbour seals, NAMMCO has advised that Iceland conduct more regular monitoring of the population and also recommend increased research on other ecological parameters regarding the Icelandic grey seal populations. The current aim is to conduct aerial surveys to produce population estimates every other year. A census was undertaken in 2017 and is due to report this year.

Grey seal by-catch is shown in Table 28. The grey seal by-catch estimates in 2014-2016 are exclusively from the lumpsucker gillnet fishery which does not catch ling. The NAMMCO working group on by-catch noted that grey seal estimates in the lumpsucker fishery are extremely high, arising from 3 observed events were 17, 16 and 12 grey seals were caught. Outside of those three events only one grey seal was observed among 57 observed hauls. Based on the latest population estimate of grey seals in Iceland, the estimated by-catch amount represents over 60% of the total population. The working group noted that the estimate is therefore considered inaccurate and requires further analysis. MFRI has undertaken some recent work to compare by-catch estimates in the lumpsucker gillnet fishery made using the existing method with alternative estimates stratified by management area, depth and month[184].

Harbour porpoise

As previously discussed, the annual MFRI cod gillnet survey mimics fleet effort and represents approx. 2% of the total effort in the fishery. The MFRI uses data from their gillnet survey to estimate by-catches of marine mammals in the fishery. Harbour porpoise is the most commonly by-caught marine mammal in this gear, likely as a consequence of the fishery occurring further offshore and in deeper waters so seals are less likely to interact with it.

Annual estimates of harbour porpoise by-catch have decreased in recent years as gillnet effort has decreased, from a high of 7,300 animals in 2003 to about 750 animals in 2014-2015. The 2014-2015 figures represent about 0.5-2.4% of the range of the population estimated from the last porpoise stock assessment conducted in 2007. This abundance estimate (43,179 animals, 95% confidence intervals of 31,755-161,899[185]) is considered to be a minimum estimate because it was based on an incomplete aerial survey.

[183] 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

[184] MRFI (2018b). By-catch of seabirds and marine mammals in lumpsucker gillnets 2014-2017. https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

[185] 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

MFRI, in collaboration with the University of Potsdam, is undertaking work at present to update the abundance estimate using genetic research (close kin analysis)[186]. In 2016, there was a substantial increase in harbour porpoise by-catch in gillnets; the rate was five times higher in cod gillnets than that recorded in 2014 and 2015 (with the same amount of observer effort[187]) and the total by-catch represents about 1.9-9.5% of the population estimate range. ASCOBANS has advised that the maximum annual anthropogenic induced mortality for harbour porpoise should not exceed 1.7% of the total population size so this threshold is likely to have been met or exceeded in 2016[188]. 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 as a consequence of reduced fishing effort and indicates that the replacement potential of the porpoise population must be higher than implied by the precautionary 1.7% reference point. An alternative or additional 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).

Banana pingers were tested in 2017 to try to reduce porpoise by-catch in the cod gillnet survey. There was no difference in the observed by-catch in a paired trial, with three porpoises caught in 70 observed hauls of 840 nets with banana pingers and four in 70 observed hauls of 840 nets without any pingers[189][187].

Consistency of management of the fishery's ecosystem impacts with the precautionary approach.
As outlined in the supporting evidence above, the most probable adverse impacts of the Icelandic fisheries are considered and those impacts likely to have serious consequences are addressed either by an immediate management response or further analysis of the identified risk. In Icelandic ling commercial fisheries available evidence supports the conclusion that the consideration of the adverse impacts of the fishery on the ecosystem and resulting management actions are demonstrably consistent with the precautionary approach as required by the IRFF Standard.

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

8.3.1.2. 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.[190]

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

Summary Evidence:
Impacts that may have serious consequences include on retained species, vulnerable species and life stages, benthic ecosystems including Vulnerable Marine Ecosystems (VMEs) and interactions with seabirds and mammals. Impacts that are likely to have serious consequences are addressed including measures to reduce impacts on non-target commercial species through the ITQ system and prohibition of discarding. A system of real time, permanent and temporary closures exists to protect vulnerable life stages of fish species including spawning and juvenile stages. Vulnerable Marine Ecosystems are protected by closures. Information on non-commercial by-catch species, seabirds and mammals is limited as there hasn't been systematic recording and there are concerns about the reliability of logbook and observer/inspectors records.

[186]NAMMCO, 2017. Iceland Progress report on marine mammals in 2017. NAMMCO/26/NPR-I-17 https://nammco.no/wp-content/uploads/2018/01/2017-iceland_progress_report_final.pdf
[187]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
[188]OSPAR, 2009. Background Document for Harbour porpoise Phocoena phocoena. OSPAR Commission. http://www.ascobans.org/en/document/ospar-background-document-harbour-porpoise-phocoena-phocoena
[189] 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
[190] 2005/2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.

Measures have been put in place to improve recording by observers/inspectors but there are still significant differences between logbook and observer/inspector records. This disparity has been observed in the lumpsucker gillnet fishery but it is not clear how representative this is of other Icelandic fisheries. Further work is being undertaken in this area particularly in relation to the higher risk gillnet fisheries through the Committee for Consultation on Responsible Management of Living Marine Resources. What information is available suggests low levels of seabird and marine mammal in Icelandic fisheries with the exception of the gillnet fisheries. In the lumpsucker gillnet fishery high levels of seal by-catch have been recorded but ling is not caught in this fishery. Ling is caught in the cod gillnet fishery but this forms a relatively small proportion of total commercial ling catches at 8% in 2016/2017. In the cod gillnet fishery the main marine mammal by-catch is harbour porpoise. By-catch rates have been decreasing in recent years as netting effort has decreased, although in 2016 there was five-fold increase in catches thought to be due to changing density of porpoise on the fishing grounds. The by-catch of porpoise in 2016 is at or higher than the 1.7% limit for anthropogenic mortality on harbour porpoise populations recommended by ASCOBANS which could suggest a population level impact. However, it should be noted that there is uncertainty over the current harbour population size given the 2007 survey is now quite old and considered an underestimate. Recent observations also suggest that the replacement potential of porpoise is higher than implied by the 1.7% reference point. For these reasons we do not consider the evidence supports that a population level impact is occurring. Work is on-going to update the harbour porpoise population estimate through genetic research. Testing of the efficacy of pingers in reducing porpoise by-catch in the gillnet fishery has been undertaken recently but their use showed no reduction in by-catch.

Sea birds are occasionally attracted to the baited hooks in longline fisheries, the main gear used in the Icelandic ling fishery. The by-catch is dominated by northern fulmars. The low level of seabird interactions in Icelandic longline fisheries is at least in part due to longliners' use of bird scaring devices, such as acoustic cannons and tori lines, and night setting in an effort to minimise interactions between seabirds and their gear. Northern fulmar are listed as 'of least concern' on the IUCN Red List.

Further evidence of reliable data collection from the improved observer/inspector programme and the electronic logbook reporting system would increase confidence that there are no adverse impacts on vulnerable species, marine mammals and seabirds. By-catch rates of harbour porpoise should be kept under review and assessed in light of updated stock assessments as they come available. Further action may be required if rates remain high.

Evidence:

Retained species

Most commercially fished species in Iceland are now part of the ITQ system. Discarding of these commercial species 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. Note that in Iceland observers are referred to as 'Inspectors' and unlike most observers have the authority to fine or charge the vessel with criminal charges. All fisheries are subject to observation but the extent of observer coverage varies, it is 1-2% on average (see Table 29 below) but there are some exceptions for perceived higher risk fisheries, such as 3.64% in the gillnet fisheries and 100% coverage of purse seiners operating in the fjords. Discards are not included in the fisheries assessments as they are generally considered to be negligible; however, should the situation change and discards increase then these changes should be detectable within the system (as noted above).

Table 29. Directorate 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%

In the 2016/2017 fishing season, Icelandic ling were mainly caught in longline fisheries (59%) and by demersal trawl (23%) with most of the remainder taken by gillnet (8%), *Nephrops* trawl (7%) and Danish seines (2.4%). The main species caught with Icelandic ling by these gears (in order of magnitude) are cod, golden redfish, saithe, haddock, Greenland halibut, deep sea redfish, Atlantic wolffish, plaice, greater argentine, tusk, *Nephrops*, witch, lemon sole, anglerfish and megrim. These stocks are subject to ICES stock assessment and TAC-setting. Cod, golden redfish, saithe, haddock and Greenland halibut, which form the vast majority of the species caught alongside ling (Table 23 in clause 3.1.1) are all above their biological limit points and MSY $B_{trigger}$. Atlantic wolffish, plaice, greater argentine and witch lack biomass reference points but their stock levels are high and fishing mortality is at or below F_{MSY}.

Fishing mortality of lemon sole as measured by F_{proxy} has been very variable, but both biomass and recruitment indices are high and the stock is expected to remain stable or increase. With regard to the remaining species, megrim currently has a high biomass but looking forward a decline is expected due to poor recruitment. MFRI does not advise a TAC for the species in 2018/2019. Deepsea redfish, *Nephrops* and anglerfish also lack biomass reference points and stocks are considered to be low, although fishing mortality is also low and below F_{MSY} or proxy targets where these exist. Further information on the status of these species can be found in clause 3.1.1.

Vulnerable species interactions

The discard prohibition only applies to commercially important species (and protected species including Atlantic halibut *Hippoglossus hippoglossus*[191] and porbeagle (*Lamna nasus*), basking shark (*Cetorhinus maximus*) and spiny dogfish/spurdog *Squalus acanthias*[192] unless they are captured alive in which case they must be released) and systematic recording of non-commercial by-catch has not occurred. Until recently the observer programme has only covered commercial species and similarly the sampling by MRI, fishers and the MRV survey using a commercial vessel (for example, the 'Flóarall' or 'Flaxabay' survey) are focussed on commercial species. However, measures have been taken in recent years to extend the observer programme to cover by-catch such as elasmobranchs (pers. comm. MFRI, site visit) and records for by-catch species including skate *Dipturus batis*, Atlantic halibut, dogfish, Greenland shark *Somniosus microcephalus* and porbeagle *Lamna nasus* can be seen in the catch data available via the Fisheries Directorate website[193]. These are seen to be either vulnerable or endangered, threatened or protected (ETP) species.

Stocks of grey skate and Atlantic halibut are both at low levels. Both are also widely distributed, fished in many types of fishing gear, very large and mature late. No assessment is carried out for grey skate and indices of abundance are uncertain as only limited survey data exists. However, trends in total numbers in the groundfish survey indicate some increase. Recruitment and biomass indices of Atlantic halibut decreased rapidly between 1985 and 1992 and have remained low since. It is evident that the stock has suffered a recruitment failure and is expected to remain low over the next few years. In 2012, a regulation was issued to ban all targeted fishing for Atlantic halibut and stipulating that all viable halibut must be released in other fisheries. The effects of this are evidenced by a sharp drop in halibut landings after 2011. MRI recommends that these regulations should be maintained until clear indications of improvement in the stock are evident.

No stocks assessments of spiny dogfish and Greenland shark have been undertaken and there has been no recent assessment of porbeagle so the stock status of these species is unknown or uncertain. In 2017, a regulation was issued to ban all targeted fishing for spiny dogfish and porbeagle and stipulating that all viable specimens must be released in other fisheries and dead specimens sold as VS catch. A small scale artisanal fishery for Greenland shark exists and the species is also a periodic by-catch in bottom trawl fisheries. Landings of the three species are low, especially so for porbeagle - amounting to about 1 tonne a year or less. As spiny dogfish are an aggregating species, landings have been dominated by relatively few large hauls which has led to large fluctuations in annual landings and/or survey results.

There is a system of area closures in operation in Iceland, comprising real time, permanent and temporary closures which can protect vulnerable species or life stages of fish. Real time area closures have been in operation since 1976 to protect juvenile fish. Fishing is prohibited for at least two weeks in areas where the number of small fish in the catches has been observed by inspectors to exceed a certain percentage and if, in a given area, there are several consecutive closures the Minister of Fisheries can issue regulations that close the area for a longer period. Inspectors from the Directorate of Fisheries supervise these closures in collaboration with MFRI. In 2017 there were 119 real-time area closures, less than the 148 in 2016 (pers. comm. Icelandic Coastguard, site visit). There are also permanent and temporary area closures in place to protect juveniles. Temporary closures of the major spawning grounds of cod, plaice and wolfish reduce fishing during the main spawning period of these species.

Interactions of fishing gear with benthic ecosystems

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 ling by the Icelandic fleet in the 2016/2017 fishing season, 59% was taken by longlines, 23% by demersal trawls, 8% by gillnets, 7% by Nephrops trawls and 2.4% by Danish seines. Icelandic groundfish fisheries are multispecies in nature and as such the effects of bottom contact fishing gears are not separable by species.

[191] Regulation 470/2012. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302
[192] Regulation 456/2017. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017
[193] http://www.fiskistofa.is/english/quotas-and-catches/

The most widely used bottom fishing gear in Icelandic waters are demersal otter trawls the effects of which are dependent on seabed and community type. 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. Available data on fishing effort are very accurate and have made it possible to map in detail the distribution of bottom trawl effort (Figure 42, clause 3.1.1). The reduction in the intensity and footprint of the bottom trawl fishery in recent years is also evidenced by a reduction in total fishing effort (Figure 43, clause 3.1.1).

Protection of Vulnerable Marine Ecosystems (VMEs)

It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs), from significant adverse impact from bottom-contacting fishing gear. As a result of this policy, large areas of Icelandic waters are closed, 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 fishing. Furthermore, not all the fishable shelf areas outside closed areas are trawlable, as some parts of the seabed are unsuitable for trawl gear. The 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. VMEs of particular importance within Icelandic waters are sponge, sea-pen and cold-water coral communities and hydrothermal vent areas and further information on these communities and habitats is provided in clause 3.1.1.

Interactions with Seabirds and Marine Mammals

By-catch of marine mammals and seabirds in Icelandic waters has not been systematically investigated until recently. Pálsson *et al*. (2015)[194] reviewed data from logbooks and on-board observers and found that reports of seabird and marine mammal by-catch were few in all gear types with the exception of gillnets (see also Table 27). Similar findings were made in by-catch monitoring undertaken by the MFRI in 2016 in the lumpsucker gillnet (57 trips/days), cod gillnet (60 trips/days), demersal trawl (61 trips/780 days), monkfish gillnet (3 trips/days) and longline fisheries (72 trips/ 230 days) within the Icelandic EEZ (see table below)[195]. Aside from gillnets, by-catch of seabirds and marine mammals in the major gear used to target ling (i.e. longlines and bottom trawls) is likely to be relatively small. The effects of longlines, bottom trawls and gillnets on marine mammals and seabirds are discussed further in clause 3.1.1.

In relation to the quality of by-catch data, it is important to note that observers cover all gear types (as noted previously approximately 1-2% coverage in all fisheries) but the sampling is not focused on documenting seabird and marine mammal by-catch. Most attention to seabird and marine mammal by-catch is paid in the gillnet fisheries, where most of the by-catch is assumed. Less information is available from other fishing gears. It is also important to note that even where observers are present they are not always in a position to document any by-catch. For instance, in the pelagic pair trawl fishery, observers are below deck to monitor the catch, and not in a position to see if a seabird or marine mammal is caught[196]. Since 2014, this has improved with stricter guidelines regarding marine mammal by-catch and supervision of the observers. Prior to this the observer data on marine mammal by-catch is not considered reliable.

Further, fishers are required to report the incidental catch of marine mammals and seabirds and the electronic logbook system allows for these animals to be recorded along with normal catch. As of February 2014, all interactions between fishing gears and marine mammals/seabirds including the number and species of the animal in question must be reported[197][172]. However, following the implementation of the new electronic logbook system in 2010 there was a reduction in by-catch records and there are indications that by-catch is not being reported or is being under-reported. In the lumpsucker gillnet fishery MRFI noted by-catch rates were 5 times higher when an inspector was present in 2014-2016 than when they were absent. In 2017, reported by-catch by the lumpsucker fleet has increased, which suggests better compliance, but overall by-catch rates are still much lower than observed in trips by the inspectors[198]. It is not clear how representative this compliance rate is of other Icelandic fisheries. The North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on By-catch noted, in relation to by-catch data

[194] Pálsson, O. K., Gunnlaugsson, Þ. and Ólafsdóttir, D. (2015). By-catch of sea birds and marine mammals in Icelandic fisheries. MRI, 2015. https://www.hafogvatn.is/static/research/files/fjolrit-178pdf

[195] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf

[196] 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

[197] http://www.reglugerd.is/interpro/dkm/WebGuard.nsf/key2/557-2007

[198] MRFI (2018b). By-catch of seabirds and marine mammals in lumpsucker gillnets 2014-2017. https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

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[199]. A smartphone app is in development by the Directorate of Fisheries, which is intended to make both the 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 first 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 the legal framework. Further, the Icelandic ministry of Industry and Innovation has recently created a Committee for Consultation on Responsible Management of Living Marine Resources which has a specific remit to address bycatch in the gillnet fisheries for lumpfish and cod and in particular data recording, data availability and reliability and propose management measures to reduce bycatch (see document in clause 3.1.1).	
References:	See footnotes.
Non-Conformance Number (if relevant)	**NA**

[199] 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

8.3.2. Clause 3.2. Specific Criteria

8.3.2.1. Clause 3.2.1. Information gathering and advice

8.3.2.1.1. 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:
There is information available on the legal specification of fishing gear in Icelandic fisheries. The primary aim of fishing gear regulations is size selectivity of the gear with a secondary aim being species selectivity.

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, 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)[200].

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)[201]. Shrimp (Pandalus) fisheries are associated with by-catches of juvenile finfish species. To minimise such by-catch, the use of sorting grids is mandatory.

Additionally, longliners in Iceland are obliged to 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 interaction), generally in the winter period. The requirement follows Regulation 456 issued in 1994[202].

The MFRI routinely conducts selectivity experiments to assess the performance of the main fishing gears and to assess ways in which selectivity might be improved. For example, 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 published in 2017[203]. The authors looked at the main species caught by longliners in Iceland, (*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. Since the introduction of electronic log-books in the Icelandic fleet, more technical details of fishing gear construction have been routinely gathered. The gear technology group have also investigated the utility of this type of data in terms of refinements in CPUE estimates and trawl footprint (swept area).

Stocks of non-target species commonly caught in the fisheries for the stock under consideration are monitored and their state assessed as appropriate; non-target species in this instance refer to other commercially fished stocks and not to other marine organisms that may be retained.

[200] https://www.reglugerd.is/reglugerdir/allar/nr/543-2002
[201] http://www.ices.dk/sites/pub/publication%20reports/forms/marine.aspx?rootfolder=/sites/pub/publication+reports/expert+group+report/acom/2011/nwwg&folderctid=0x0120005daf18eb10daa049bbb066544d790785&view=%7B5c7a53f9-446e-486e-93af-841fc20c1773%7D
[202] https://www.stjornartidindi.is/Advert.aspx?RecordID=8bd54700-a433-413f-83ed-48cd60438a4b
[203] https://www.sciencedirect.com/science/article/abs/pii/S0165783617300541

The MFRI provides annual catch advice for 40 different species[204] (including non-fish species such as sea cucumber, marine mammals and seaweed), while catch statistics are routinely collected and publically available for many more. The Directorate of Fisheries monitors catches of a larger suite of 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[205]. See discussion and figures relating to retained species in clause 3.1.1 for further details.	
References:	See footnotes.
Non-Conformance Number (if relevant)	**NA**

8.3.2.1.2. Clause 3.2.1.2.

Information shall be available on the potential effect of fishing on endangered, threatened and protected species[206], as appropriate and relevant in the context of the unit of certification.

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

Summary Evidence:

The gears used in the Icelandic ling commercial fishery have the potential to capture endangered, threatened and protected species (ETP) species including Atlantic halibut, spurdog, porbeagle and basking shark. The stock status of these species is unknown or at low levels but Icelandic landings are also low. Measures are in place to reduce catches of the protected species Atlantic halibut, spurdog, porbeagle and basking shark. Data on non-commercial by-catch which includes these ETP species, has not been collected systematically until very recently. There have been issues noted with regard to reliable recording of by-catch by observers and under-reporting of by-catch by fishers. The latter comes from investigations in the lumpsucker fishery and it is not clear how representative this compliance rate is of other Icelandic fisheries. Further work on by-catch recording is in progress particularly in relation to the higher risk gillnet fisheries through the recently created Committee for Consultation on Responsible Management of Living Marine Resources. See Clause 2.3.2.4 for further details, including the identified minor non-conformance and associated corrective action plan. Information is available on the potential effect of fishing on ETP species, as appropriate and relevant in the context of the unit of certification but further evidence of reliable data collection from the improved observer programme and electronic logbooks reporting system is required to increase confidence in this judgement

Evidence:

Iceland has ratified a number of international conventions, such as the Bern Convention on the Conservation of European Wildlife and Natural Habitats, the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the OSPAR Convention and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA). These conventions have established objectives for conserving endangered, threatened or protected species and habitats, and if issues are identified relating to ETP species, a number of mechanisms have been developed to detect and reduce impacts. Iceland's implementation of these international conventions and resolutions is the responsibility, either partially or fully, of the Icelandic Institute of Natural History (IINH) on behalf of the Ministry for the Environment and Natural Resources[207].

Iceland is also a member of the North Atlantic Marine Mammal Commission (NAMMCO) an international regional body for cooperation on conservation, management and study of cetaceans and pinnipeds in the North Atlantic. Whilst Iceland has ratified these conventions it is important to note that reservations have been submitted. For example, cetaceans are not protected under national legislation and on CITES Iceland has made reservations against all the cetacean species found in Icelandic waters which mean it is not bound by the provisions of the Convention for these species[208]. Minke and fin whale are hunted in Icelandic waters and subject to an annual TAC.

[204] https://www.hafogvatn.is/en/harvesting-advice
[205] http://www.fiskistofa.is/english/quotas-and-catches/catches-in-individual-species/
[206] 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.
[207] IINH (2001). Biological Diversity in Iceland. National Report to the Convention on Biological Diversity. Icelandic Institute of Natural History. https://www.stjornarradid.is/media/umhverfisraduneyti-media/media/vidhengi/wpp0437.html/Biodiversity%20Report%20Iceland.pdf
[208] https://www.cites.org/eng/app/reserve.php

A number of species are protected under national fisheries regulations including Atlantic halibut and spurdog, porbeagle and basking shark which prohibits directed fisheries and requires live fish to be released to the sea and recorded in the electronic logbook and dead specimens landed as VS catch[209],[210].

Data on non-commercial by-catch has not been collected systematically until very recently. There have been issues noted with regard to reliable recording of by-catch by observers and under-reporting of by-catch by fishers in the lumpsucker gillnet fishery. Measures have been put in place to improve recording but there are still significant differences between logbook and observer records. The latter comes from investigations in the lumpsucker fishery and it is not clear how representative this compliance rate is of other Icelandic fisheries. A smartphone app is also in development by the Directorate of Fisheries, which is intended to make both the 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 first 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 the legal framework. Further, the Icelandic ministry of Industry and Innovation has recently created a Committee for Consultation on Responsible Management of Living Marine Resources which has a specific remit to address bycatch in the gillnet fisheries for lumpfish and cod and in particular data recording, data availability and reliability and propose management measures to reduce bycatch (see document provided in clause 3.1.1. Other information collected on these ETP species, relevant to the potential effect of fishing upon them, is set out below:

Atlantic halibut Hippoglossus hippoglossus (Icelandic: Lúða)
Recruitment and biomass indices decreased rapidly between 1985 and 1992 and have remained low since. Survey catches of Atlantic halibut have predominantly been 3 – 5 year old immature fish. These age groups have been in decline for over 20 years, and it is evident that the stock has suffered a recruitment failure. It is therefore likely that the stock will remain low over the next years.

In 2012, a regulation was issued to ban all targeted fishing for Atlantic halibut and stipulating that all viable halibut must be released in other fisheries. The effects of this are evidenced by a sharp drop in halibut landings after 2011 (Table 25 in clause 3.1.1). MRI recommends that these regulations should be maintained until clear indications of improvement in the stock are evident. Total landings in the 2016/2017 fishing season amounted to 114 tonnes. The biomass index shows some increase in recent years.

Spiny dogfish/spurdog Squalus acanthias (Icelandic: Háfur)
A few hundred tonnes of spiny dogfishes were fished annually by foreign fleets when they operated in Icelandic waters. However, Icelandic catches have always been low, in 2016/2017 they amounted to 3 tonnes. As spiny dogfish are an aggregating species, landings may be dominated by relatively few large hauls leading to large fluctuations in annual landings and/or survey results. They are an infrequent catch in research surveys and so no assessment is carried out. Indices of abundance are uncertain because of limited data. There is no directed fishery for spiny dogfish and catches are solely as by-catch in other fisheries, primarily gillnet fisheries off the southern coast during the summer months. As noted above, in 2017, a regulation was issued to ban all targeted fishing for spiny dogfish and stipulating that all viable specimens must be released in other fisheries and dead specimens landed as VS catch. Although the abundance of spiny dogfish is low in Icelandic waters compared to many bony fishes, this is still the most common shark species.

Porbeagle *Lamna nasus* (Icelandic: Hámeri)
Icelandic landings of porbeagle are very low, amounting to about 1 tonne a year or less. There are no directed fisheries for porbeagle so landings are as by-catch. The northeast Atlantic population as a whole has been historically heavily exploited by longline fisheries, principally by Denmark, France, Norway and Spain and it has been classed as vulnerable on the IUCN Red List. The International Commission for the Conservation of Atlantic Tunas (ICCAT) last undertook an assessment of the Northeast Atlantic stock in 2009. They noted considerable uncertainty in identifying stock status relative to virgin biomass. Exploratory assessments indicate it is below B_{MSY}[211]. A joint ICCAT/ICES stock assessment is scheduled for 2019. ICES advise that fishing mortality should be minimised and no targeted fisheries should be permitted. Within EU waters there has been no TAC since 2010[212]. As noted above, in 2017, a regulation was issued to

[209] Regulation 470/2012. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302
[210] Regulation 456/2017. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017
[211] https://www.iccat.int/Documents/SCRS/ExecSum/SHK_ENG.pdf
[212] ICES. 2017. Report of the Working Group on Elasmobranchs (2017), 31 May-7 June 2017, Lisbon, Portugal. ICES CM 2017/ACOM:16. 1018 pp

ban all targeted fishing for porbeagle and stipulating that all viable specimens must be released in other fisheries and dead specimens landed as VS catch. **Basking shark *Cetorhinus maximus* (Icelandic: beinhákarl)** During the November 2018 site visits, the MFRI also reported that few basking sharks have been reported as bycatch in logbooks, so some interactions have been documented in the past. They seem however to be very rare and far between. As noted above, in 2017, a regulation was issued to ban all targeted fishing for basking shark and stipulating that all viable specimens must be released in other fisheries and dead specimens landed as VS catch.

References:	See footnotes.

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

8.3.2.2. Clause 3.2.2. By-catch and discards

8.3.2.2.1. 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: **Discarding, including discarding of catches from non-target commercial stocks, is prohibited under Icelandic law.**
Evidence: Icelandic fishery law prohibits the discarding of all commercial stocks. Commercial species are listed yearly in documents such as the annual MFRI advice. Catches of these species are subjected to a discard ban (Regulation No. 57/1996) with inbuilt flexibility measures as previously discussed in Section 3.1. Monitoring for compliance is a responsibility of the at sea inspectors and the Coast Guard.

References:	

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

8.3.2.2.2. 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: **Understanding of the by-catch of marine mammals and seabirds is limited as there hasn't been systematic recording and there are concerns about the reliability of logbook and observer records. Measures have been put in place to improve recording by observers but there are still significant differences between logbook and observer records. This disparity has been observed in the lumpsucker gillnet fishery but it is not clear how representative this is of other Icelandic fisheries. Further work is being undertaken in this area particularly in relation to the higher risk gillnet fisheries through the Committee for Consultation on Responsible Management of Living Marine Resources. However, the available evidence suggests that, aside from gillnets, by-catch of seabirds and marine mammals in the major gear used to target ling (i.e. longlines and bottom trawls) is likely to be minimal.** **With regard to gillnets, ling are caught in the cod gillnet fishery but this forms a small proportion of total ling landings (8%). By-catch rates of harbour porpoise, which form the bulk of marine mammal by-catch, have decreased in recent years as gillnet effort has decreased although in 2016 there was five-fold increase in catches thought to be due to changing density of porpoise on the fishing grounds. The by-catch of porpoise in 2016 is at or higher than the 1.7% limit for anthropogenic mortality on harbour porpoise populations recommended by ASCOBANS which could**

suggest a population level impact. However, it should be noted that there is uncertainty over the current harbour population size given the 2007 survey is now quite old and considered an underestimate. Recent observations also suggest that the replacement potential of porpoise is higher than implied by the 1.7% reference point. For these reasons we do not consider the evidence supports that a population level impact is occurring. Work is on-going to update the harbour porpoise population estimate through genetic research. Some research has been undertaken into measures to reduce porpoise by-catch using pingers although those trialled proved ineffective. Seabird bycatch in the cod gillnet fishery is dominated by common murre / guillemot and northern fulmar. Catches of these species are very low in relation to their total population sizes which are both very large although declining.

Sea birds are occasionally attracted to the baited hooks in longline fisheries, the main gear used in the Icelandic ling fishery. A relatively small level of interaction was recorded with seabirds in the MFRI's 2016 by-catch monitoring of longline vessels, 11 northern fulmar *Fulmarus glacialis*. The low level of seabird interactions in Icelandic longline fisheries is at least in part due to longliners' use of bird scaring devices, such as acoustic cannons and tori lines, and night setting in an effort to minimise interactions between seabirds and their gear. Northern fulmar is listed as 'of least concern' on the IUCN Red List. This evidence indicates that appropriate steps are being taken to avoid, minimize or mitigate encounters with seabirds and marine mammals. Further evidence of reliable data collection from the improved observer programme and electronic logbooks reporting system would improve confidence in this judgement. By-catch rates of harbour porpoise should be kept under review and assessed in light of updated stock assessments as they come available. Further action may be required if rates remain high.

Evidence:

By-catch of marine mammals and seabirds in Icelandic waters has not been systematically investigated until recently. Pálsson *et al*. (2015)[213] reviewed data from logbooks and on-board observers and found that reports of seabird and marine mammal by-catch were few in all gear types with the exception of gillnets (see also Table 27 in clause 3.1.1). Similar findings were made in by-catch monitoring undertaken by the MFRI in 2016 in the lumpsucker gillnet (57 trips/days), cod gillnet (60 trips/days), demersal trawl (61 trips/780 days), monkfish gillnet (3 trips/days) and longline fisheries (72 trips/230 days) within the Icelandic EEZ (see Table 26 in clause 3.1.1)[214]. Aside from gillnets, by-catch of seabirds and marine mammals in the major gear used to target ling is likely to be relatively small.

There have been issues noted with regard to reliable recording of by-catch by observers and under-reporting of by-catch by fishers in the lumpsucker gillnet fishery. As of February 2014, stricter rules were implemented[215] regarding recording marine mammal by-catch (all interactions between fishing gears and marine mammals/seabirds including the number and species of the animal in question must be reported) and supervision of observers. A smartphone app is also in development by the Directorate of Fisheries, which is intended to make both the 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 seabird interactions/bycatch first 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 the legal framework. Further, the Icelandic ministry of Industry and Innovation has recently created a Committee for Consultation on Responsible Management of Living Marine Resources which has a specific remit to address bycatch in the gillnet fisheries for lumpfish and cod and in particular data recording, data availability and reliability and propose management measures to reduce bycatch (see document provided in clause 3.1.1.). Further supporting information on the interaction between the fishing gears and marine mammals and seabirds is found in clause 3.1.1 and includes information on steps taken to avoid, minimize or mitigate encounters with seabirds and marine mammals. This is summarised below:

Seabird interactions

Pálsson *et al*., (2015) reported that sea birds are occasionally attracted to the baited hooks in longline fisheries. As noted above a relatively small level of interaction was recorded with seabirds in the MFRI's 2016 by-catch monitoring of longline vessels, 11 northern fulmar *Fulmarus glacialis.* The low level of seabird interactions in Icelandic longline fisheries is at least in part due to longliners' use of bird scaring devices, such as acoustic cannons and tori lines, and night setting in an effort to minimise interactions between seabirds and their gear. Northern fulmar is listed as 'of least concern' on the IUCN Red List.

[213] Pálsson, O. K., Gunnlaugsson, Þ. and Ólafsdóttir, D. (2015). By-catch of sea birds and marine mammals in Icelandic fisheries. MRI, 2015. https://www.hafogvatn.is/static/research/files/fjolrit-178pdf

[214] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf

[215] Regulation No. 126/2014. https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967

Pálsson *et al.*, (2015) did not record any observations of seabirds in the bottom trawl fishery and none were recorded in MFRI's 2016 by-catch monitoring.

Pálsson *et al.* (2015) used data from the annual MFRI cod gill net survey, which mimics fleet effort and represents approx. 2% of the total effort in the fishery, to estimate 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 and was dominated by common murre / guillemot *Uria aalge* (330 birds representing 72% of total bird by-catch in the survey) and northern fulmar *Fulmarus glacialis* (50 birds representing 19% of total bird by-catch). The common guillemot has a European population of between 2 and 3 million individuals and northern fulmar has a European population of between 7 and 8 million individuals. If the catch rate observed in the cod gill net survey was multiplied to total fleet effort this would represent about 0.66% and 0.03% of their respective populations. Although both populations are very large, both species have been experiencing rapid declines to the extent that common guillemot have been classed as 'near threatened' by the IUCN Red List and norther fulmar as 'endangered'. The MFRI's 2016 by-catch monitoring also found common guillemot and northern fulmar to be the most frequently caught seabirds in gillnets but also found high catches of eider *Somateria mollissima* and black guillemot *Cepphus grille*. Eider has a European population of between 1.6 and 2 million individuals and black guillemot has a European population of between 300,000 and 700,000 individuals. Both populations are considered to be decreasing. Eider is listed as vulnerable by the IUCN Red List, while black guillemot is listed as of least concern. Gillnets are not a major contributor to ling catches, accounting for 8% in 2016/2017.

The other seabird species reported in the fishing gears used in the ling fishery are listed as species of least concern on the IUCN Red List, with the exception of Atlantic puffin *Fratercula arctica*, eider *Somateria mollissima*, great northern diver *Gavia immer* and long-tailed duck *Clangula hyemalis*, which are listed as vulnerable and razorbill *Alca* torda, listed as near threatened. Trends in the populations of seabird species around Iceland are thought to be primarily result from fluctuations in food availability. Given the numbers of seabirds caught compared to the overall populations and the level of natural variation in seabird populations as a result of environmental drivers it is unlikely that Icelandic ling fisheries are having significant negative impacts on any seabird species. Further supporting information on the interaction between the fishing gears and marine mammals an seabirds is found in clause 3.1.1

Marine mammal interactions

The three main marine mammal species bycaught in Icelandic fisheries are harbour porpoises *Phocoena phocoena*, harbour seals *Phoca vitulina* and grey seals *Halichoerus grypus*. While the majority of marine mammal by-catches occur in gillnet fisheries there are also incidences of seal by-catches in bottom trawls; Pálsson *et al.*, (2015) and the MFRI's 2016 by-catch monitoring did not report any incidences of marine mammal by-catches in Icelandic longline fisheries.

In the lumpsucker gillnet fishery high levels of seal by-catch have been recorded but ling is not caught in this fishery. Ling is caught in the cod gillnet fishery but this forms a relatively small proportion of total commercial ling catches at 8% in 2016/2017. In the cod gillnet fishery the main marine mammal by-catch is harbour porpoise. Annual estimates of harbour porpoise by-catch have decreased in recent years as gillnet effort has decreased, from a high of 7,300 animals in 2003 to about 750 animals in 2014-2015. The 2014-2015 figures represent about 0.5-2.4% of the range of the population estimated from the last porpoise stock assessment conducted in 2007. This abundance estimate (43,179 animals, 95% confidence intervals of 31,755-161,899[216]) is considered to be a minimum estimate because it was based on an incomplete aerial survey. MFRI, in collaboration with the University of Potsdam, is undertaking work at present to update the abundance estimate using genetic research (close kin analysis)[217].

In 2016, there was a substantial increase in harbour porpoise by-catch in gillnets; the rate was five times higher in cod gillnets than that recorded in 2014 and 2015 (with the same amount of observer effort[218]) and the total by-catch represents about 1.9-9.5% of the population estimate range. ASCOBANS has advised that the maximum annual anthropogenic induced mortality for harbour porpoise should not exceed 1.7% of the total population size so this threshold is likely to have been met or exceeded in 2016[219].

[216] 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

[217] NAMMCO, 2017. Iceland Progress report on marine mammals in 2017. NAMMCO/26/NPR-I-17 https://nammco.no/wp-content/uploads/2018/01/2017-iceland_progress_report_final.pdf

[218] 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

[219] OSPAR, 2009. Background Document for Harbour porpoise Phocoena phocoena. OSPAR Commission. http://www.ascobans.org/en/document/ospar-background-document-harbour-porpoise-phocoena-phocoena

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 as a consequence of reduced fishing effort and indicates that the replacement potential of the porpoise population must be higher than implied by the precautionary 1.7% reference point. An alternative or additional 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 also 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). By-catches of marine mammals in Icelandic fisheries have generally been decreasing in line with a decrease in gillnet effort (Figure 48 in clause 3.1.1).

References:	See footnotes.

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

8.3.2.2.3. 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:
The available evidence indicates that non-target catches, including discards, of stocks other than the target stock do not threaten these non-target stocks with serious risk of extinction.

Evidence:
A system of ITQ is in place in Iceland and discarding of non-target commercial catches is prohibited. This also applies to protected species including Atlantic halibut and spurdog, porbeagle and basking sharks unless they are captured alive in which case they must be released. Measures are in place to protect vulnerable life stages of commercial species including spawning and juveniles through real time, permanent and temporary closures.

Understanding of the by-catch of non-commercial species and marine mammals and seabirds is limited as there hasn't been systematic recording and there are concerns about the reliability of logbook and observer records. Measures have been put in place to improve recording by observers but there are still significant differences between logbook and observer records. This disparity has been observed in the lumpsucker gillnet fishery but it is not clear how representative this is of other Icelandic fisheries. Further work is being undertaken in this area particularly in relation to the higher risk gillnet fisheries through the Committee for Consultation on Responsible Management of Living Marine Resources. Vulnerable species that the fishery may interact with include grey skate, Atlantic halibut, spurdog, basking shark, Greenland shark and porbeagle. The stock status of these species is unknown or at low levels but Icelandic landings are also low. Measures are in place to reduce catches of the protected species Atlantic halibut, spurdog, porbeagle and basking shark as mentioned previously.

Low levels of seabird and marine mammal by-catch have been recorded in Icelandic fisheries with the exception of the gillnet fisheries. In the lumpsucker gillnet fishery high levels of seal by-catch have been recorded but ling is not caught in this fishery. Ling is caught in the cod gillnet fishery but this forms a relatively small proportion of total commercial ling catches at 8% in 2016/2017. In the cod gillnet fishery the main marine mammal by-catch is harbour porpoise. By-catch rates have been decreasing in recent years as netting effort has decreased, although in 2016 there was five-fold increase in catches thought to be due to changing density of porpoise on the fishing grounds. The by-catch of porpoise in 2016 is at or higher than the 1.7% limit for anthropogenic mortality on harbour porpoise populations recommended by ASCOBANS which could suggest a population level impact. However, it should be noted that there is uncertainty over the current harbour population size given the 2007 survey is now quite old and considered an underestimate. Recent observations also suggest that the replacement potential of porpoise is higher than implied by the 1.7% reference point. Work is on-going to update the harbour porpoise population estimate through genetic research.

Testing of the efficacy of pingers in reducing porpoise by-catch in the gillnet fishery has been undertaken recently but their use showed no reduction in by-catch. Seabird bycatch in the cod gillnet fishery is dominated by common murre/guillemot and northern fulmar. Catches of these species are very low in relation to their total population sizes which are both very large although declining.

Sea birds are occasionally attracted to the baited hooks in longline fisheries. A relatively small level of interaction was recorded with seabirds in the MFRI's 2016 by-catch monitoring of longline vessels, 11 northern fulmar. The low level of seabird interactions in Icelandic longline fisheries is at least in part due to longliners' use of bird scaring devices, such as acoustic cannons and tori lines, and night setting in an effort to minimise interactions between seabirds and their gear. These seabird species are all listed as 'of least concern' on the IUCN Red List. Trends in the populations of seabird species around Iceland are thought to primarily result from fluctuations in food availability. Given the numbers of seabirds caught compared to the overall populations and the level of natural variation in seabird populations as a result of environmental drivers it is unlikely that Icelandic ling fisheries are having significant negative impacts on any seabird species.

The available evidence indicates that non-target catches, including discards, of stocks other than the target stock do not threaten these non-target stocks with serious risk of extinction.

Further details of the measures in place to minimise the impact of the fishery on retained species and vulnerable species and life stages have been provided under clause 3.1.1.

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

8.3.2.2.4. Clause 3.2.2.4.

Suitable steps shall be considered to avoid, minimize or mitigate encounters with endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification.

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

Summary Evidence:
Suitable steps are made to avoid, minimize or mitigate encounters with the ETP species, including Atlantic halibut, spurdog, porbeagle and basking shark which are appropriate and relevant in the context of the unit of certification. These measures include a ban on directed fishing, a requirement to release live by-catch in other fisheries and a discard prohibition for dead specimens.

Evidence:
Suitable steps are considered to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of Icelandic ling commercial fisheries. In the context of this certification scheme ETP species in Icelandic waters are limited to Atlantic halibut, spurdog, porbeagle and basking shark. These are protected under national fisheries regulations which prohibit directed fisheries and requires live fish to be released to the sea and recorded in the electronic logbook.

As discussed previously other species which might be considered vulnerable such as common/grey skate, marine mammal and seabird species are assessed under clause 3.1.1. However, there are also mechanisms in place to mitigate adverse impacts on these species such as the use of acoustic cannons, tori lines and night setting in Icelandic longline fisheries to minimise interactions with vulnerable seabirds.

Further information on the ETP species have been provided under clause 3.1.1 and also 3.2.1.2.

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

8.3.2.2.5. 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. Reporting lost gear is compulsory. Where the Fisheries Directorate finds and recovers lost or abandoned gear they recover the cost of recovery from the gears' owner. Additionally, the Icelandic ITQ system operates in such a way that gear losses are minimised.

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. Lost gear must be reported to the coastguard, it is considered more of an issue for gillnet fisheries compared to other fisheries and purse seines and trawls aren't lost (pers. com. Fisheries Directorate, site visit). Recycling schemes are in place to encourage fishers to bring old gear ashore and it is illegal to dump old gear at sea. Where the Fisheries Directorate finds and recovers lost or abandoned gear the Directorate recovers the cost of recovery from the gears' owner. 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[220].

A new environmental management system has recently been introduced on longline vessels operated by Visir which tracks the fishing gear on-board and deployed by the vessel (volume of gear, numbers of hooks etc.) so that it is possible to confirm all gear is recovered. It also covers other aspects relevant to the management of the vessel including fuel consumption and packaging waste from bait (pers. com. site visit).

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, a quite rare situation.

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, 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."*

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 footnote.

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

[220] http://vefbirting.oddi.is/raduneyti/fiskveidar2018/108/

8.3.2.3. Clause 3.2.3 – Habitat Considerations

8.3.2.3.1. 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:

An array of permanent, seasonal and real-time closures are implemented by Icelandic authorities to protect spawning and juvenile fish. 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.

Cold water coral and hydrothermal vent Vulnerable Marine Ecosystems (VMEs) have also been identified and protected in closures. Whilst other VMEs, sea-pen and sponge communities, may not have closures specifically designed for them there is evidence that they are likely to receive some benefit from existing closures (for example, the abundance of sponge communities in some cold water coral closed areas).

With a total effective closed area in excess of 50% of the Icelandic shelf area it is felt that action has been taken to avoid, minimise or mitigate impacts of the fisheries on spawning, nursery areas or other essential habitats that are at risk from the negative impacts of the fishing gear.

Evidence:

There is a system of area closures in operation in Iceland, comprising real time, permanent and temporary closures to protect vulnerable species or life stages of fish:

Real time area closures have been in operation since 1976 to protect juvenile/small fish. Fishing is prohibited for at least two weeks in areas where the number of small fish in the catches has been observed by inspectors to exceed a certain percentage and if, in a given area, there are several consecutive closures the Minister of Fisheries can issue regulations that close the area for a longer period. Inspectors from the Directorate of Fisheries supervise these closures in collaboration with MFRI. In 2017 there were 119 real-time area closures, less than the 148 in 2016 (pers. comm. Icelandic Coastguard, site visit).

In addition to the real time closures, there are also permanent and temporary area closures in place to protect juveniles. Temporary closures of the major spawning grounds of cod, plaice and wolfish reduce fishing during the main spawning period of these species.

Closures are also in place to protect vulnerable marine ecosystems from significant adverse impact from bottom contacting gear. Known cold-water coral reefs and hydrothermal vents are protected through permanent closures. Other VMEs; sponge and sea-pen communities benefit from these and the other closures.

As a result of these measures, large areas of Icelandic waters are closed, temporarily or permanently, to fishing including:

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

Information continues to be collected to ensure vulnerable areas that overlap with fishing effort are identified. This comes from MFRI research programme, ground fish survey, fishing industry and observers.

For more information relating to closed areas within the Icelandic EEZ see supporting evidence for clause 3.1.1.

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

8.3.2.3.2. 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 undertaken sea bed mapping to identify, through scientific and formal methods, vulnerable marine ecosystems (VMEs) including continuous stony coral areas and implemented closures to protect them.

Evidence:
It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs) including cold water coral areas from significant adverse impact from fishing gear. As a result of this policy, large areas of Icelandic waters are closed, 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 fishing. Furthermore, not all the fishable shelf areas outside closed areas are trawlable, as some parts of the seabed are unsuitable for trawl gear. The 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.

Specific closures have been implemented to 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.

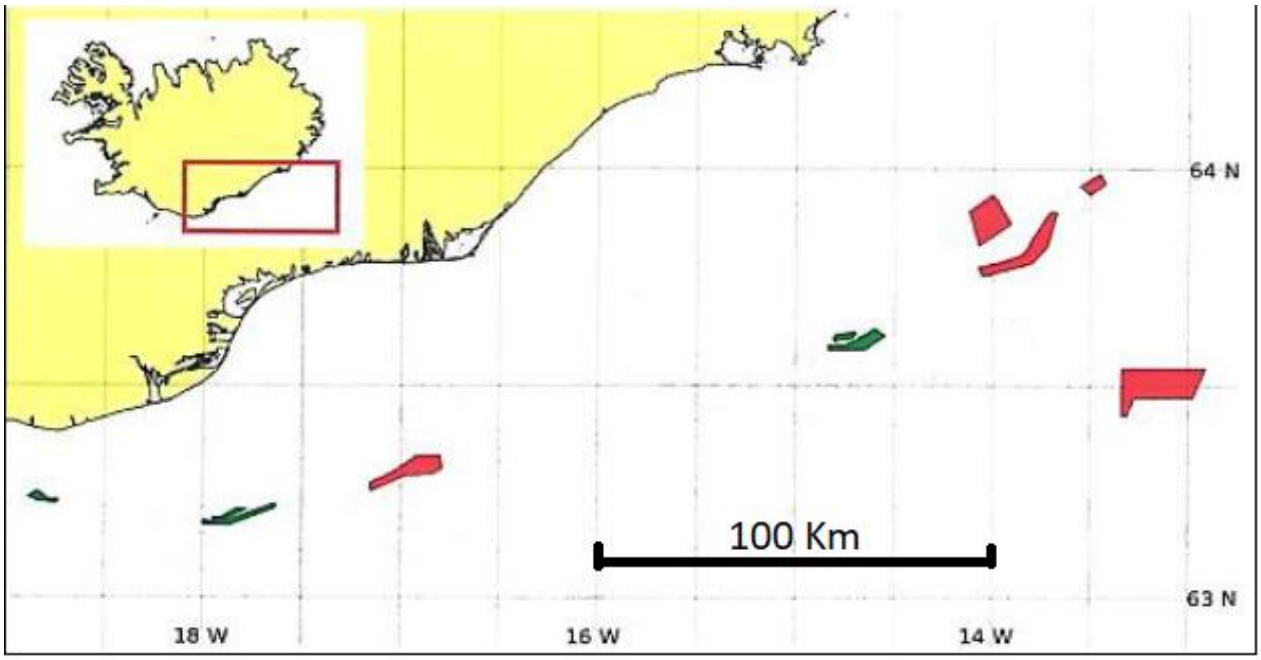

Figure 50. Ten coral closures in South East Iceland, current as of November 2018. Maps can be viewed by downloading Google Earth and clicking on the following kml file produced by the Directorate of Fisheries http://uv.fiskistofa.is/uv.kml

Further supporting information is provided in clause 3.1.1

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

8.3.2.3.3. 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: **The Icelandic government has undertaken sea bed mapping to identify, through scientific and formal methods, vulnerable marine ecosystems (VMEs) including continuous stony coral areas and implemented closures to protect them. 10 areas have been closed in South East Iceland where significant coral cover has been identified through scientific research.**				
Evidence: Please see the evidence presented under clause 3.2.3.2				
References:				
Non-Conformance Number (if relevant)				**NA**

8.3.2.3.4. 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 on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island and are fully protected by environmental law.**				
Evidence: It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs) including hydrothermal vent areas from significant adverse impact from fishing gear. As a result of this policy, large areas of Icelandic waters are closed, 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 fishing. Furthermore, not all the fishable shelf areas outside closed areas are trawlable, as some parts of the seabed are unsuitable for trawl gear. The 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. There are two known hydrothermal vent areas with a series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island (see Figure 47 for details) and are fully protected under the Nature Conservation Act (Notice No.'s 249/2001[221] and 510/2007[222]). Further information on these closures and their protections can be found on the Environment Agency of Iceland website[223]. 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 considered threatened by fishing activities.				
References:	See footnotes.			
Non-Conformance Number (if relevant)				**NA**

[221] https://www.stjornartidindi.is/Advert.aspx?RecordID=6e1cf8c7-d6de-449f-8924-a9627265c8cb
[222] https://www.stjornartidindi.is/Advert.aspx?RecordID=df0afbbe-e2b5-4b5e-887b-15fb83bf0f2e
[223] https://www.ust.is/einstaklingar/nattura/fridlyst-svaedi/nordurland-eystra/hverastrytur-i-eyjafirdi/

8.3.2.4. Clause 3.2.4. Foodweb Considerations

8.3.2.4.1. 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:
Ling are not a key prey species but an important predator. MFRI are involved in work which has developed an ecosystem model which takes into account species interactions and can help inform development of ecosystem based fisheries management approach.

Evidence:
There is a growing international focus on food web considerations in fisheries management; this is evidenced by the Marine and Freshwater Research Institute's involvement in the development of ecosystem based understanding of the relationship between multi-species stocks and other ecosystem components – a so called 'multi-species stock system and management approach'. The MFRI are part of a research group that have recently published the first end-to-end model for Icelandic waters using the Atlantic modelling framework[224]. The model resembles the ecosystem of the Icelandic waters; the modelled area covering 1,600,000km^2 around Iceland with 52 functional groups incorporated including fish, mammal, seabird, invertebrate, primary producers, bacteria and detritus groups. The model was shown to be able to replicate the time-series of biomass and landings for the major commercial groups and saithe, redfish and tooth whales were found to have the greatest effect on other groups in the system. This ecosystem model can be used to support ecosystem-based fisheries management (EBFM) by taking into account interactions between species which are not considered by the single species stock assessment models upon which fisheries management advice is currently mainly based.

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

As previously mentioned, for a variety of reasons large areas within the Icelandic EEZ are closed for fishing; various gear restrictions are also in effect. 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 MRI provides advice on closures to protect VMEs which are promptly processed within the Ministry of Industries and Innovation (Fisheries department).

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

[224] Sturludottir, E., Desjardins, C., Elvarsson, B., Fulton, E. A., Gorton, R., Logemann, K. & Stefansson, G. (2018). End-to-end model of Icelandic waters using the Atlantis framework: Exploring system dynamics and model reliability. Fisheries Research, 207: 9-24. https://www.sciencedirect.com/science/article/pii/S0165783618301620

8.3.2.5. Clause 3.2.5. Precautionary Considerations

8.3.2.5.1. 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[225], as being of serious concern in the fishery in question.

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

Summary Evidence:
The most probable adverse impacts of the Icelandic fisheries are considered and impacts likely to have serious consequences are addressed. Consideration of the adverse impacts of the fishery on the ecosystem and resulting management actions are demonstrably consistent with the IRF Standard.

Evidence:

Icelandic government policy aims to protect Vulnerable Marine Ecosystems (VMEs) from significant adverse impact from fishing and legislation exists to provide for the prohibition of fishing activities with bottom-contacting gear in areas where VMEs occur. Annual MFRI advice includes a specific section on the ecosystem impacts of Icelandic fisheries[226]. Measures to minimize or mitigate any ecosystem issues identified include real time, temporary and permanent areal closures, technical measures such as the use of tori lines in longline fisheries 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.

A short-term sudden closure system has been in force since 1976 with the objective to protect juvenile fish. If, in a given area, there are several consecutive sudden closures, the Ministry can issue a regulation to close the area for a longer time period, thus directing the fleet to other areas. Restrictions are mainly to protect juvenile fish but also to decrease the effort towards bigger spawners. Additionally, many areas have been closed permanently. These closures are based on knowledge of the biology of various stocks with the aim of protecting juveniles and vulnerable marine ecosystems, e.g. coldwater corals.

As mentioned above, large areas within the Icelandic EEZ are closed for fishing, either temporarily or permanently. Restrictions on the use of gear are also in effect. 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 for example large demersal trawlers are not permitted to fish within 12 nm from the shore. 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 by-catch grids when fishing for pelagic species in certain areas.

Finally, as previously discussed, 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.

Consistency of management of the fishery's ecosystem impacts with the precautionary approach

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

References:	See footnote.

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

[225] 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. ...

[226] https://www.hafogvatn.is/static/files/Veidiradgjof/vistkerfi.pdf

9. External Peer Review

The IRF programme requires that reports be reviewed by a minimum of two Peer Reviewers. In addition the collective competence of the Peer Reviewers must meet the qualification criteria identified for fishery assessment teams.

Based on the technical expertise required, a team of Peer Reviewers was selected. Peer Reviewers were asked to focus on specific parts of the assessment depending on their particular areas of expertise but were also asked to provide comments elsewhere where they saw fit to do so. The team of Peer Reviewers for this assessment was made up of:

- Prof. Geir Hønneland
- Dr. Lisa Borges
- Deirdre Hoare

Note. Peer reviewer information has been removed and peer reviews are unattributed in this report.

9.1. Peer Reviewer A

9.1.1. General comments – Peer Reviewer A

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. A recommendation for more formal conservation plans/measure for sponges and sea-pens should also be considered by the assessment team.	The Assessment Team thank the Reviewer for their constructive feedback throughout. A recommendation to the effect stated by the Reviewer has been added to the report (see Recommendation 1).

9.1.2. Scoring element review – Peer Reviewer A

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.	No response required. The suggested improvement is noted for future reference. The Team has tried to keep repetition to a minimum, but this is not always possible given the fact that the Standard itself is quite repetitive in parts.

9.1.2.1. 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		
1.1.4		
1.1.5		
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	
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		

#	Peer Reviewer Comments	Assessment Team Response
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		
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1.5.4		
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1.5.6		
1.5.7		
1.5.8		
1.5.9		
1.5.10		

9.1.2.2. 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		
2.3.2.5		
2.3.2.6		
2.3.2.7		
2.3.2.8		
2.3.2.9		
2.3.2.10		
2.3.2.11		
2.3.2.12		
2.3.2.13		
2.3.2.14		
2.3.2.15		
2.3.2.16		
2.3.2.17		

#	Peer Reviewer Comments	Assessment Team Response
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		

9.1.2.3. 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. Further evidence of reliable data collection from the improved observer programme and electronic logbooks reporting system is required to improve confidence that there are no adverse impacts on vulnerable species, marine mammals and seabirds. Will this be collected along with the information required by the non-conformance?	The peer reviewers view is noted. However, the information is presented here as evidence in support of the scoring for the clause. The scope of the clause is wide so the information presented is comprehensive. It is also presented in this way to be consistent with the format of the report template and the approach taken in other clauses. With regards to the second comment, this is the specific issue the non-conformance seeks to address. The corrective action associated with the non-conformance involves the establishment of the Committee for Consultation on Responsible Management of Living Marine Resources which has been tasked with addressing by-catch issues. Work has commenced to improve data recording, data availability and reliability and explore certain management measures to reduce bycatch of non-commercial species including vulnerable species, marine mammals and seabirds. Evidence of appropriate recording of marine mammal and seabirds catches in fishing logbooks is due to be provided by the client in time for the next audit.
3.1.2	While it is clear that work is underway regarding the harbour porpoise, from the report it would seem that fishing is having a serious population impact on the harbour porpoise. A non-conformance should be raised here that ensures management strategies are improved substantially. The key issue is that a strategy is introduced to aid the recovery of its populations.	The Team note the Reviewer's comment but disagree that the evidence indicates fishing is having a serious population impact on the harbour porpoise and that a non-conformance should be raised. The 2007 population figure used to assess population level impact is likely not representative of the true population size. It was incomplete and considered a minimum estimate only. Questions have also been raised over the 1.7% threshold advised by ASCOBANS for maximum annual anthropogenic induced mortality for harbour porpoise. For example, as noted in evidence for clause 3.1.1, scientists suggest that higher numbers of harbour porpoise occurring in the cod gillnet fishery in recent years suggests an increase in the porpoise stock due to reduced fishing effort and that the replacement potential of the population must be higher than implied by the precautionary 1.7% reference point (Pálsson et al., 2015). However, measures are in progress to improve understanding of porpoise population size (the close-kin analysis referred to in clause 3.1.1) and also to reduce the by-catch of porpoise in the cod gillnet fishery. In particular, studies into the use of pingers have been undertaken, although initial results indicate the pingers are not a successful deterrent.
3.2	**Specific Criteria**	
3.2.1	**Information gathering and advice**	
3.2.1.1	N/A	

#	Peer Reviewer Comments	Assessment Team Response
3.2.1.2	A minor non-conformance is raised here but there is no Non-Conformance number, it could be related to Non-Conformance 1 with its relevant corrective action plan but this is not stated here.	The Peer Reviewer is correct – this is captured by Non-Conformance 1. Text and scoring have been updated to reflect this.
3.2.2	**By-catch and discards**	
3.2.2.1	N/A	
3.2.2.2	N/A	
3.2.2.3	N/A	
3.2.2.4	N/A	
3.2.2.5	N/A	
3.2.3	**Habitat Considerations**	
3.2.3.1	Currently, there are explicit conservation measures for cold water corals and hydrothermal vents but nothing explicit for either deep sea sponge aggregations or sea pen fields. I would recommend that more formal conservation measures are formulated for these VMEs.	The Assessment Team notes the Peer Reviewers recommendation. As noted in the assessment whilst sponge aggregations and sea pen fields do not have closures specifically designed for them they benefit from other closures – for example the abundance of sponge communities in some cold-water coral closed areas. During the site visit, the MFRI note that they keep closures under review – in light of the fishing footprint and benthic habitat mapping (informal long-term mapping project which involves opportunistic studies – availing of ship time as it comes available). They use the ICES list of VME indicator species, as well as OSPARs, and consider all species on these lists. They note that this needs careful interpretation as species occurrence isn't the same as identification of the habitat of that species – this understanding needs to be built over time and is on-going. ICES list of VME indicator species: https://www.ices.dk/marine-data/data-portals/Pages/vulnerable-marine-ecosystems.aspx OSPAR list of threatened and/or declining habitats: https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats
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	

9.1.3. Conclusion – Peer Reviewer A

I agree with the conclusion of the assessment team based on the evidence presented in the assessment report, that the fishery should be certified.

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.

As the Reviewer largely agrees with the Assessment Team the Team has no specific response.

9.2. Peer Reviewer B

9.2.1. General comments – Peer Reviewer B

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 I fully agree with the Team's conclusions.	The Team thanks the Reviewer for their positive feedback. Where the Reviewer has made specific comments or raised questions, these have in turn elicited a specific response from the Team.
I haven't proofread the report, but the Team should attempt to make the use of names of the management bodies consistent. Fisheries Directorate/Fishing Directorate/Directorate of Fisheries/Fisheries Administration are used in different parts of the report; Coast Guard/Coastguard and MRI/MFRI likewise.	The Team appreciate the feedback. An effort has been made to ensure entities are named consistently throughout the report.
There is a lot of repletion in the text, which partly follows from the structure of the Standard itself. But in many scoring tables, far more information is included than what is necessary to document that the respective requirements have been met, which sometimes makes it a bit challenging to search out what is really relevant. In Section 2, for instance, information on monitoring, enforcement, sanctions and compliance is listed more or less throughout, instead of focusing on what exactly is asked for in the specific requirement. I am not asking the team to make any changes in that regard in the present report, but it is something to be aware of on later occasions.	Again, the Team appreciate the feedback. In future a greater effort will be made to ensure that only directly relevant information is presented for each clause.

9.2.2. Scoring element review – Peer Reviewer B

Peer Reviewer Comments	Assessment Team Response
Background Section	
P.9: The summary and recommendation seem to be a left-over from an Assessment Validation Report.	Fixed with thanks.
P. 15, second paragraph under 3.2: Same ('should the fishery enter assessment'	Fixed with thanks.

9.2.2.1. Section 1 – Fisheries Management

#	Peer Reviewer Comments	Assessment Team Response
1.1	**The Fisheries Management System**	
1.1.1	What exactly is meant by 'Policies incorporate a number of International Agreements'? Does it mean that international agreements are made binding in domestic law?	These are conventions and agreements that Iceland has ratified; the official formulation is: *Policies incorporate a number of International Agreements, including; UN Convention of the Law of the Sea, Agenda 21 of the Rio Declaration, FAO Code of Conduct for Responsible Fisheries and the International Plan of Action to prevent, deter and eliminate Illegal, Unregulated and Unreported Fishing.* These agreements have been ratified by Iceland and Iceland claims to have been promoting the development of such agreements (see https://www.government.is/topics/business-and-industry/fisheries-in-iceland/international-policy/). To find out exactly how they are reflected in legislation, and to what extent they are binding in domestic law would require legal expertise that is perhaps beyond the remit of the Assessment Team. In any case the Team is confident that the specific requirements of the relevant clause are met.
1.1.2		
1.1.3		
1.1.4		
1.1.5		
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	The justification in this clause (1.1.10) is generally weak. Unlike in the justification of most Clauses, the evidence is rather sparse.	Most of the evidence relevant to this clause had already been presented by this point and as such this clause was used as an opportunity to present evidence that was lost in the previous clauses. The alternative would have been to have summarised the previously presented evidence. To avoid excessive repetition this was not done.

#	Peer Reviewer Comments	Assessment Team Response
1.1.10.2		
1.1.10.3		
1.1.10.4	The 'description of the process' is rather superficial.	Clause 1.1.5 has the most extensive description. It is also covered in 1.1.2.
1.1.10.5	It is only stated that consultations take place – a closer description of these consultations is needed; as it stands now, the formulations in the requirement are just repeated in the rationale.	Supporting rationale has been amended. Further evidence of consultation processes is provided in supporting rationales for Clauses 1.2.5, 1.5.5 and 3.1.1 but in short there are regular communications between scientists, mangers and industry, both in formal meetings and through informal contact. There also are specific consultation groups that meet annually in December allowing industry to describe their experiences of the past season and compared this to previous years. MFRI also publishes short newsletters regularly providing up-dates on stock analysis and related research outcomes.
1.1.10.6		
1.1.10.7	I cannot see that the objectives relevant to ecosystem effects are covered in the rationale.	Comment acknowledged. There are no such objectives explicitly stated. If there were any, they would have to be rather vague - there are no recognized strong ecosystem effects of a long-line fishery for ling. Implicitly, there is some incentives to avoid damage (catching of birds in the long line fishery, avoidance of vulnerable habitats etc.).
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		
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**	

#	Peer Reviewer Comments	Assessment Team Response
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		
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1.5.4		
1.5.5		
1.5.6		
1.5.7		
1.5.8		
1.5.9		
1.5.10		

9.2.2.2. Section 2 – Compliance and Monitoring

#	Peer Reviewer Comments	Assessment Team Response
2.1	**Implementation, Compliance, Monitoring, Surveillance and Control**	
2.1.1	The contents of the inspections of the Directorate of Fisheries at sea are specified, but not those of the Coast Guard. Do they differ or overlap? The instances of fees imposed for illegal catches increased tenfold from 2016 to 2017 – any particular reason?	There is some overlap, but the Coast Guard is more concerned with enforcement of fishery regulations (e.g. mesh sizes, logbook records, etc..) while the Directorate staff accompanies vessels on fishing trips to count and measures fish caught. The "illegal catches" category relates to incidences of vessels that have taken longer than the permitted 3 days to balance their quota (Pers. com. Fiskistofa). The reason for the increase is not known but information will continue to be monitored on an on-going basis at annual surveillance audits.
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		
2.3.2.5		
2.3.2.6	Clause 2.3.2.6: The rationale just repeats the requirement by stating that recorded catches are 'compared' with the catch stored onboard. Does that entail physical control of the entire holds (e.g. measurement of the volume of the holds, control weighing of boxes, calculation into round weight by use of conversion factors), or is it just a comparison of	The Coast Guard takes fish samples on-board of fishing vessels and verify e-logbook data to ensure that records match with catches. In addition, the Directorate inspects catch both at-sea and on landing and as such can compare landed and reported weights.

#	Peer Reviewer Comments	Assessment Team Response
	figures in reports submitted to authorities and recorded catch in the logbook and/or other logs onboard?	
2.3.2.7		
2.3.2.8		
2.3.2.9	I applaud the team for recognizing other compliance mechanisms than state enforcement, like self-policing. It would be interested to hear whether the team also thinks that the legitimacy of rules, or of the enforcement bodies, can be considered constituent parts of the overall enforcement regime in Icelandic fisheries.	The Reviewer's comment is appreciated. The assessment team is firmly of the view that stakeholder "buy in" is an important part of the Icelandic fisheries management regime. At past site visits there have been indications that in the early days of the ITQ system there were some issues but as the system has matured (being almost 30 years old at this point) and as the benefits of relatively stable catches have been felt that the issues that stakeholders might have with the current regime have lessened.
2.3.2.10		
2.3.2.11		
2.3.2.12		
2.3.2.13		
2.3.2.14		
2.3.2.15	In addition to the official weighing by licensed weighers, are there spot checks by inspectors from the Directorate of Fisheries?	Yes. There are both random spot checks as well as more targeted ones based on risk analysis with targeted inspections increasing the efficiency of the system.
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	Table 21: It is natural that infringement and sanctions vary from year to year, but is there any specific reason that fees imposed for illegal catches increased tenfold from 2016 to 2017?	As discussed previously, these "illegal catches" relate largely to vessels taking longer than permitted to balance their quota rather than illegal catches *per se* (Pers. com. Fiskistofa). The specific reason for the increase is not known but information will continue to be monitored on an on-going basis at annual surveillance audits.
2.3.5	**Analysis is carried out**	
2.3.5.1		
2.3.5.2		
2.3.5.3		

9.2.2.3. 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		

9.2.3. Conclusion – Peer Reviewer B

The conclusions of the assessment team are appropriate based on the evidence presented in the report.

The non-conformances are appropriate.

The Corrective Action Plan represent a step in the right direction to address the minor non-conformance identified.

The Assessment Team has no specific response beyond thanking the Reviewer for their input.

9.3. Peer Reviewer C

9.3.1. General comments – Peer Reviewer C

Peer Reviewer Comments	Assessment Team Response
General Comments	
The report provides generally sufficient information to make a decision in each clause, but there are a few clauses where the information provided does not support the conclusion reached. Another aspect of the report is that there are a few strong statements made that can have significant 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 TAC decisions that follow the HCR except when there are "very compelling and concrete arguments" not to do so. Finally, any reference to at-sea observers is incorrect and should be reviewed throughout the report. Normal at-sea inspection work can include the collection of biological samples (which is the case in Iceland), but this does not make them an observer programme. Observers programmes, even if they have a Monitoring Control & Surveillance component, have different sampling strategies, assumptions and limitations, while collecting different data than an inspection boarding, and thus have different uses and value in the estimation of discarded quantities.	Where the Peer Reviewer has indicated that the evidence provided by the Team does not sufficiently support the conclusion reached, the supporting evidence has been strengthened/clarified as appropriate. Overall the team has effectively taken management statements at "face value" as there is no indication that this is not appropriate in the context of the Icelandic fisheries management system. Nevertheless, where such incidences have been identified by the Reviewer, the Team has tried to strengthen the supporting rationale to provide additional corroboration. Reference to at-sea observers has been changed to inspectors throughout.

9.3.2. Scoring element review – Peer Reviewer C

Peer Reviewer Comments	Assessment Team Response
Background Section	
The Background section has some of the necessary information and would improve if reference to the documents were included in the text. In opposition, the tables with the clauses justification provide much more information than the background text. It is a choice to either provide the information in the background section and then summarised in the clause tables or the opposite. However, when there is only summary information in the background section, as in this report, one tends to either miss information needed for scoring (previous) clauses or the information added is not relevant to the issue being analysed. For example, the issues with the TAC being overshot is only explained in depth in clause 1.5.8, but this information was relevant to previous scoring clauses.	The Team appreciate the feedback. As the Reviewer notes, there is somewhat of a choice to be made as to where best to present information. To avoid too much repetition, the most specific information is presented against the relevant clauses. While information might be relevant across multiple clauses, the most "in depth" analysis has been conducted against the most appropriate clause.

9.3.2.1. Section 1 – Fisheries Management

#	Peer Reviewer Comments	Assessment Team Response
1.1	**The Fisheries Management System**	
1.1.1		
1.1.2	Are "catches in conformity with amounts allowed by the competent authorities"? TACs have been overshot to significant %s in the past thus one cannot conclude that catches are in conformity with amounts allowed by the competent authorities. Furthermore, as the management system allows for that overshoot, one wonders if the system is not too permissive that the objectives of long-term sustainability cannot be put in to jeopardy? "*For ling, an estimate (of discards) was made in 2011*." And how much was that estimate? Please provide the value given in further points. How are TACs set? It is stated that "*In practice the Ministry follows almost all recommendation by the MFRI and very compelling and concrete arguments have been needed in the few instances in later years when the Ministry has allowed bigger total allowable catches than recommended by the Institute.*" makes the decision-making process of setting TACs unclear, un-transparent and likely influenced by short-term objectives. For all these questions, the information presented does not support the evidence rating assigned**.**	The competent authorities may allow degree of "overshooting"; therefore, catches need not necessarily conform to the original recommended TAC for the fishery to be in conformance. For several species, including ling, final catches sometimes exceed TACs set according to the harvest rule; examination of catches and quotas reveal multiple reasons for that, including inter-year and inter-species transfers and arrangements to support small scale fisheries in local communities, that are outside the ITQ system. These arrangements have evolved over time and are intended to rationalise the fishery and reduce incentives to discard. In addition, TACs are often allocated solely to Icelandic vessels with foreign catches therefore being outside the quota system. In most recent years, national quotas have been set below recommendations, to partially account for foreign catches. Inter-year transfers may not be a big problem as they generally just move TACs between years without changing the total over time. Inter-species transfers may be more problematic, if one species is more vulnerable than the other. Rather than requiring the Icelandic authorities to abandon such arrangements, the assessment team recommends that the TAC according to the rule is regarded as a preliminary TAC, that the likely overshoot is quantified as far as possible, and that in future evaluations of the harvest rule, the difference between preliminary TAC and final catch is included in simulations. Then, the rule leading to the preliminary TAC would consider that this TAC is modified, and that this modification is tolerable for the stock. Discard estimate: For ling, the estimate of discards, covering the years 2001-2010 was <0.1% both by number and by weight. Reference: Discard estimate and overview of quota modifications: Gudmundur Thordarson, 2011. Estimates of tusk and ling discards in the Icelandic longline fishery. WGDEEP-2011:WD02: pages 10 – 18[227].

[227] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2011/WGDEEP/wgdeep_Annex02_WorkingDocuments_2011.pdf

#	Peer Reviewer Comments	Assessment Team Response
1.1.3	Related to the above, are TACs "effectively implemented"?	The ITQs seem to be effectively implemented, but the overall catch may deviate, as outlined under 1.1.2 above.
1.1.4		
1.1.5	Please see comments on TAC setting transparency on 1.1.2.	See responses to same.
1.1.6	The fact that in the ITQ system, quota is reserved for local fisheries may also be a mechanism to avoid tension and conflict between fisheries. This should be referred to.	Comment acknowledged. This is a good point and one of the ancillary benefits of the ITQ system. A comment to this effect has been added to the scoring table for this clause.
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	"*A biomass target is considered redundant, and is not defined."* Why? The stock is managed through Bpa being the HCR trigger, which is actually Bloss, and it was demonstrated to be precautionary and in line with ICES MSY approach, but that does not necessarily mean that the targets of the Icelandic policy would be reach, as the biomass trigger is quite low, meaning that the stock is managed in order to avoid recruitment failure instead of reaching a higher stock level. Further explanation is needed.	See Clause 1.3.1.4.
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	Please see above point 1.1.2 on TAC settings decisions. A clarification is needed to ensure that "A description of the process for making decisions on Total Allowable Catch (TAC) - how and on what basis management decisions are made" is clear.**.**	Refer to 1.1.2.
1.1.10.5		
1.1.10.6	How are discards monitored? Please see point 1.2.4.1 below	See response to 1.2.4.1 below.
1.1.10.7		
1.2	**Research and Assessment**	

#	Peer Reviewer Comments	Assessment Team Response
1.2.1	What I would like to see here is information specifically related to research on ling carried out by IMFR (ex. what data is collected, what survey are done, are there any specific research projects, etc) and less what are the IMFR general objectives and means.	Comment acknowledged. The interpretation by the Assessment team was that Clause 1.2.1 is to establish IMFR as the 'competent research institute or arrangement' that 'shall collect and/or compile the necessary data ...' The detailed information of this research on ling is assembled under Clause 1.2.2.
1.2.2		
1.2.3		
1.2.4.1	An inspection-based sampling scheme to provide estimates of discards have a limited level of sampling coverage, data confidence and uncertainty. Therefore more information is needed on the monitoring scheme.	Comment acknowledged. There was a study in 2011, but there is no regular monitoring of discards in the long-line fishery for ling and tusk. Ideally, a stronger monitoring would be desirable. However, this is technically not straight-forward, as discarding is illegal. The motivation for strengthened monitoring is not strong - there seems to be a broad consensus that discards is a minor problem in this fishery, there are no strong incentives for discarding, and the studies that have been made, although limited, give no reason to concern. Ultimately, the requirement here reads: *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;* Therefore, despites some limitations, the current monitoring scheme is adequate to fulfil this requirement.
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	What are the relevant uncertainties? I would like to see at least the major ones listed.	The uncertainties included were: • Exploitation pattern, • Initial population numbers, • Growth, • Maturity

#	Peer Reviewer Comments	Assessment Team Response
		• Assessment uncertainty. • Recruitment A detailed description is given in ICES 2017; Section 3[228].
1.3.1.4	No MSY biomass levels have been estimated for this stock. MSY Btrigger used by ICES is actually Bloss, and one suspects that actual MSY Btrigger and Bmsy are significantly higher than Bpa (which is Bloss for this stock) since Fmsy is considerably lower than Fpa (HRmsy and HRpa). So there are no "Appropriate reference points" determined for biomass at MSY. Therefore the information presented does not support the evidence rating assigned**.**	The harvest rule, which is a rule to limit exploitation and not a target biomass rule, does not need biomass reference points, apart from the B_{lim} which sets an lower precautionary bound for abundance. The ICES biomass reference points are set routinely according to ICES standards. They serve as a guidance if there is no approved rule adopted, and are sometimes used to classify stocks, but they are not part of the rule. The rule has two reference points: • A standard harvest rate (0.18) • A trigger biomass, below which the harvest rate is reduced. For the time being, this is set equal to the Bpa.
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	It is stated that "*A long term target for the stock size is not defined. It is considered redundant as the management target is to maintain a fishing mortality that is expected to lead to a biomass fluctuating safely above the precautionary biomass limit*." Although one can refer that, since the management target is below Fmsy the objectives of MSY are reached, the criteria asks specifically for the target to be specify, explicit or implicit. If it's not specified then High Evidence Rating cannot be reached.	See clause 1.3.1.4. There is no explicit biomass target as that would require a quite different harvest rule. Implicitly, the biomass needs to be at a level associated with normal recruitment.
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)**	

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

#	Peer Reviewer Comments	Assessment Team Response
1.3.2.3.1		
1.3.2.3.2		
1.3.2.3.3	The tusk juvenile closures could be applicable to spawning ling? Because the argument that tusk juvenile closures may provide a level of protection to adult ling is made in the clause relating to the protection of juvenile ling, but juvenile ling does not concentrate in the same areas as juvenile tusk. This information should be moved to 1.3.2.3.2. here the argumentation relates to the fact that the fishery does not catch juveniles.	Comment acknowledged. Small ling does not appear in catches, but there are no specific measures to protect juvenile ling. We agree that the suggestion that some closure for tusk might be beneficial for ling as well, is not well supported. The report has been amended accordingly.
1.4	**External Scientific Review**	
1.4.1		
1.4.2		
1.5	**Advice and Decisions on TAC**	
1.5.1		
1.5.2		
1.5.3		
1.5.4		
1.5.5		
1.5.6		
1.5.7		
1.5.8	Please see above points on TAC settings decisions (1.1.2). Apart from the clear issues of TAC implementation, due very likely to a too flexible quota system, there is a clear omission in the information provided of the fact that fishing mortality has never been below HR_{mgt}, and has only reached HR_{msy} in 2001 and in the most recent year (2017). The management system has not been efficient in controlling and decreasing fishing mortality to its target, even considering TAC decisions following, in the most part, the scientific advice provided following the HCR. This clearly shows that the information presented does not support the evidence rating assigned**.**	Comment acknowledged. But it must be said that the management targets referenced have only recently been put in place Since the 2013/14 fishing year, catches have been below the recommended TAC. The estimated harvest rate is declining rapidly but has not yet reached the target. However, the assessment method has been under development until recently, there is some retrospective error in the estimates and the target harvest rate is well inside the confidence interval of the recent estimate. Therefore, it may be premature to take strong actions based on detailed comparisons of estimated vs. intended harvest rate. Nevertheless, the development of the harvest rate should be followed closely.
1.5.9		
1.5.10		

9.3.2.2. 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	Please see comments above on clause 1.1.2.	Please see response to 1.1.2.
2.2.2		
2.2.3	What about corrective measures to off-balance the overshoot of the TAC in the ling fishery? The haddock example is an interesting example that shows corrective measures for haddock. So why haven't these measures being discussed and implemented for ling? That's what the information presented should discuss.	An example specific to the ling fishery has been provided.
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	Non-conformity recording of marine mammals and seabirds.	No specific response required.
2.3.2.5		
2.3.2.6		
2.3.2.7	Please see comments above regarding discarding. What is the method to monitor discards? As stated there are no at-sea observers programmes in Iceland. "*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*." Is this the method to monitor discards, between inspection catch and self-reporting? If so it is quite unreliable, as boarding's are limited and likely insufficient to audit self-reported data, and therefore contrary to what	There are measures in place to protect the component most likely to be discarded due to "high grading" (i.e. juveniles) as well as flexibility in the ITQ system which should prevent lack of quota from becoming an incentive to discard. The absence of perverse incentives to discard as well as no evidence that this practice is prevalent within the fishery leads the Team to conclude that the risk of significant levels of discarding is likely low.

#	Peer Reviewer Comments	Assessment Team Response
	is stated ", *should the situation change and discards increase then these changes should be detectable within the system*." Thus the information provided does not support the evidence rate given.	Yes, comparison between inspectioned and self-reported catch is the major method of monitoring discards; while there be some issues with this approach the Assessment Team determined that in this instance it is commensurate with the likely level of risk. The specifics of this clause require that; 1. discarding be prohibited; 2. discarding be monitored, and; 3. the method for the monitoring of discards be specified. The Assessment Team are satisfied that these requirements are met. The fact that management entities are investigating other ways to enhance the detection of discarding is positive and does not in and of itself result in any non-conformance against this clause.
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		
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		

9.3.2.3. Section 3 – Ecosystem Considerations

#	Peer Reviewer Comments	Assessment Team Response
3.1	**Guiding Principle**	
3.1.1	Please rephrased any reference to observers programme and data. "*Note that in Iceland observers are referred to as 'Inspectors' and unlike most observers have the authority to fine or charge the vessel with criminal charges*." They are not observers, they are inspectors, which is a very different role. Please rephrase. Comments on 2.3.2.7 are also applicable.	Contrary to the peer reviewer's comment in clause 2.3.2.7 Fiskistofa inspectors do join vessels for fishing trips. These are different from the at-sea boardings undertaken by the Icelandic Coast Guard. As such there are similarities between the Fiskistofa Inspector role and that of observers, the key differences are made clear in the text, in particular, the ability to fine/make charges. However, where appropriate 'inspector' has been used to ensure consistency.
3.1.2	**A medium evidence rating with a minor non-conformity was given but no Non-Conformance Number or corrective action is given**. I assume the issue is with high bycatch of harbour porpoises in gillnet fisheries, which I agree.	Apologies, this was scored as a minor non-conformity in error. For the reasons set out in the Assessment Team's response to Peer Reviewer A's comments, we do not consider that a non-conformance should be raised in relation to impacts on harbour porpoise. Text has been updated to reflect this.
3.2	**Specific Criteria**	
3.2.1	**Information gathering and advice**	
3.2.1.1		
3.2.1.2	**A medium evidence rating with a minor non-conformity was given but no Non-Conformance Number or corrective action is given**. I assume the issue is with the lack of information regarding bycatch of ETP species in gillnet fisheries, which I agree.	This issue is captured by Non-Conformance 1. Text and scoring have been updated to reflect this.
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		

9.3.3. Conclusion – Peer Reviewer C

As stated above, the report provides generally sufficient information to make a decision in each clause, but there are several clauses where the information provided does not support the conclusion reached, and in many cases it is even contradictory to the conclusion reached. Therefore additional information should be provided, particularly regarding the Fisheries Management System, Stock Biomass and Advice and Decisions on TAC. **Furthermore, there are two medium evidence rating with a minor non-conformity given but no Non-Conformance Number or corrective action was provided.** Nevertheless, the non-conformances raised are appropriate and the Corrective Action Plan is appropriate and likely to address the non-conformance within the specified timeframe.

Where the Reviewer expressed specific concerns that the information provided did not support the conclusion reached, additional information has been added and or the rationale has been revised to provide greater clarity.

The two medium evidence rating with a minor non-conformity given but no Non-Conformance Number or corrective action were in error and this has been corrected.

The Team would like to thank the Reviewer for their input.

10. Non-conformances and Corrective Actions

10.1. Non-conformances and associated Corrective Actions

The Assessment Team has identified one MINOR non-conformance. As this is the first non-conformance for this fishery, it will be termed 'Non-conformance 1'.

In accordance with the rules of the IRF Programme, the Client is required to submit a Corrective Action Plan (CAP) to address the non-conforming area. CAPs may consist of information that directly closes out the area of non-conformity with no further action required or a plan of activities to be implemented within a specific timeframe in order for the non-conformity to be closed out. Where CAPs require the cooperation and support of fishery management organisations, these must be identified with specific tasks and activities that are to be undertaken. Please note that, while the implementation of CAPs may be on-going for an extended period, in general non-conformances should be closed out within the lifetime of any resulting certificate.

Following receipt of a CAP, the Assessment Team are required to review the CAP and determine its likely adequacy at meeting the requirements of the particular clause and the appropriateness of the timeframe to achieve close out. Consideration of the CAP will also be part of the formal certification review by SAI Global's Certification Committee prior to awarding certification/continued certification.

10.1.1. Non-conformance 1

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:	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[229]. 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 Pallson et al. 2015[230] and the March 2018 MFRI report titled: *"Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017"*. Pallson et al. 2015 highlighted the fact that their bycatch estimates were based on limited data that needed to be increased and improved with a functioning reporting system for the fishery and better follow up. The MFRI 2018 report found that although reported bycatch in E-logbooks by the fleet has increased (suggesting better compliance with reporting requirements) the overall bycatch rates are still much lower than observed in the trips by inspectors. Overall, the marine mammal and seabird bycatch rate during inspector trips was around four times higher than reported by the fleet in 2017[231].

[229] https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967
[230] https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf
[231] https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf

Non-conformance 1 (of 1)	
	Furthermore according to a 2017 presentation to NAMMCO's Working group on bycatch of marine mammals; *"logbooks have unfortunately proven unreliable" and "bycatch of birds and marine mammals [is] 18x higher when observer is present vs logbook records"*. While much of the evidence related to non-compliance with reporting requirements may relate to the lumpsucker fishery, this fishery is still part of the management system under review and in addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better.
Corrective Action Plan (CAP):	Potential non-commercial species in logbooks is a known issue and the need for further measures to encourage the reporting of incidental catches of non-commercial species in logbooks has been recognised. The Minister of Fisheries has established a minister-appointed committee (the Committee for consultation on responsible management of living marine resources hereafter Committee) that has been given the task of addressing bycatch issues, including the under-reporting aspect. The Committee comprises individuals from the main stakeholder organisations in the fishing industry as well as the Marine and Freshwater Research Institute and the Ministry of Fisheries. The Committee has recently responded to the Minister and work has commenced to improve data recording, data availability and reliability and explore certain management measures to reduce bycatch of these species. The Ministry will be working with the MFRI, the Directorate and the fishing industry in the coming months with the aim of acquiring accurate and more detailed information on frequency of non-commercial bycatches, by fishing-gear, area and time.
Assessment Team evaluation of CAP	The Assessment Team acknowledges that work has commenced on the non-commercial bycatches issue which is focused around improvement of data recording, data availability and reliability. The Team also notes the stated collective commitment of Icelandic industry and fishery management authorities, in the coming months, to acquire better and more detailed data on bycatch frequency, by fishing gear, area and time. The Team has determined that the Corrective Actions represent a step in the right direction to address the non-conformance identified. According to the corrective action plan stating that such work will be carried out in the "next [coming] months", the Client shall provide, in time for the next audit, evidence of corrective action relating to the appropriate recording of marine mammal and seabirds catches in fishing logbooks on-board of fishing vessels, as per regulation no.126/2014. The Assessment Team are therefore recommending acceptance of the Corrective Actions as appropriate and sufficient to address the non-conformance raised; if this fishery is certified, this non-conformance will remain open for subsequent review at subsequent surveillance audits. Confirmation of the Ministry of Fisheries' commitment to implementing actions to address this non-conformance can be found in Appendix 2.
Status:	**Open** – Corrective Actions in place to be reviewed annually at surveillance audits.

10.2. Recommendations

The issues highlighted in these recommendations will be reviewed at subsequent assessment audits.

10.2.1. Recommendation 1

Relevant to clauses 3.1.1 and 3.1.2.

Several Icelandic FMPs state that it is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs). Currently, there are explicit conservation measures for cold water corals and hydrothermal vents but not for deep sea sponge aggregations or sea pen fields. Therefore, the assessment team recommends that more formal conservation plans/measures be formulated for these VMEs.

10.2.2. Recommendation 2

Relevant to numerous clauses relating to catches conforming to recommended levels.

Due to the fact that there are a variety of ways to allowably overshoot TACs, the assessment team recommends that;

1. any TACs set according to established HCRs are regarded as “preliminary”;
2. that likely over/undershoots are quantified as far as possible, and;
3. that in future evaluations of HCRs, the difference between preliminary TAC and final catch is included in simulations.

In this way it might be ensured that the rule leading to the “preliminary TAC” considers that this TAC is likely to be modified (due to the degree of flexibility allowable within the ITQ system), and that any such modifications are tolerable for the stock.

11. Recommendation and Determination

11.1.1. Assessment Team Recommendation

The assessment team recommends that the management system of the applicant fisheries, Icelandic common ling (*Molva molva*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished with longlines, demersal otter trawls (also known as bottom trawls), gillnets, Nephrops trawls, Danish seine nets, hook-and-line by small vessels and gears from other Icelandic fisheries also legally landing common ling within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), be granted certification.

11.1.2. Certification Committee Determination

SAI Global/Global Trust's internal Certification Committee has determined that the management system of the applicant fisheries, Icelandic common ling (*Molva molva*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished with longlines, demersal otter trawls (also known as bottom trawls), gillnets, Nephrops trawls, Danish seine nets, hook-and-line by small vessels and gears from other Icelandic fisheries also legally landing common ling within Iceland's 200 nautical miles Exclusive Economic Zone (EEZ), be granted certification.

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13. Appendices

13.1. Appendix 1. Assessment Team Bios

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd., selected the Assessment Team members for the fishery as follows.

Sam Dignan, (Lead Assessor)

Sam Dignan is a fisheries scientist who has previously worked with the Department of Environment, Food and Agriculture (DEFA), Isle of Man and Bangor University Fisheries and Conservation Science Group (Wales). He has a BSc in Biological and Chemical Sciences with Zoology from University College Cork and an MSc in Marine Environmental Protection from Bangor University. He has experience conducting stock assessments, from the survey design and implementation phases through to final analysis and report presentation; from 2013 to 2015 he was a member of the ICES working group on scallop stock assessment. He has been involved in providing scientific data to ensure fishery compliance with the Marine Stewardship Council's (MSC) certification framework and has participated in MSC surveillance audits from a client's perspective. Sam has extensive experience of interacting directly with fishers and their representative organisations as well as members of scientific and government institutions. He was previously an advisor to the Isle of Man Queen Scallop Management Board that manages the MSC certified Isle of Man queen scallop fishery. He has also worked on the spatial analysis of fishing activity, using Vessel Monitoring System (VMS) and logbook data, to spatially quantify fishing activity and fisheries-ecosystem interactions. Sam is an ISO approved lead auditor.

Conor Donnelly, (Assessor)

Conor is an approved Fisheries Team Leader for SAI Global. He is an experienced marine ecologist and environmental manager with a background of over 17 years at the UK's statutory nature conservation body, Natural England, where he was Senior Marine Adviser responsible for marine delivery across the East Midlands, Norfolk and Suffolk. Conor has particular experience of shellfisheries and their management, Marine Protected Areas including their designation, conservation advice and monitoring, conservation legislation and policy and working with partners and stakeholders to deliver positive environmental outcomes.

Dankert Skagen, (Assessor)

Dankert retired from the Institute of Marine Research (IMR), Bergen in 2010, where he worked for 22 years. His responsibilities included stock assessment, multispecies work, in particular in the North Sea, work connected to the introduction of the precautionary approach in fisheries and more recently, on development of harvest control rules and management strategies. He was leader of the IMR research program for population dynamics and multispecies investigations in 1996-97 and for the development of new assessment tools for North-East arctic cod in 1998-99 and the assessment package TASACS in 2007-08. In addition, he has developed several programs for simulating harvest control rules that are commonly used in fisheries management today. Within ICES, he has participated in a wide range of working groups and 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.

Gísli Svan Einarsson, (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. Gísli 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.

13.2. Appendix 2. Ministry of Fisheries Letter re. Corrective Actions

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To whom it may concern

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

13.3. Appendix 3. Ministry of Fisheries Letter re. creation of Committee for Consultation on Responsible Management of Living Marine Resources

Samstarfsnefnd um bætta umgengni um auðlindir sjávar
Kristján Þórarinsson, formaður

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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

