



ICELAND RESPONSIBLE FISHERIES MANAGEMENT (IRF) CERTIFICATION PROGRAMME

Assessment Report and Determination

For The

Icelandic Summer Spawning Herring Commercial Fisheries

Facilitated By

Iceland Responsible Fisheries Foundation (IRFF)

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Glossary

AIS	Automatic Identification System
B ₄₊	Biomass of 4 years and older fish
B _{lim}	The biomass limit reference point below which there is a high risk that recruitment will be impaired and that the stock could collapse
B _{loss}	The biomass below which there is no historical record of recruitment
B _{MSY}	SSB that is associated with Maximum Sustainable Yield (MSY)
B _{pa}	Precautionary reference point designed to have a low probability of being below B _{lim}
EEZ	Exclusive Economic Zone
EU	European Union
ETP	Endangered, Threatened and Protected species*
FAO	United Nations Food and Agriculture Organization
F _{lim}	Fishing mortality which in the long term will result in an average stock size at B _{lim}
F _{max}	Fishing mortality rate that maximizes equilibrium yield per recruit
F _{MGT}	Management elected fishing mortality target/limit; usually specified in FMP
FMP	Fishery Management Plan
F _{MSY}	Fishing mortality which in the long term will result in an average stock size at B _{MSY}
F _{pa}	Precautionary reference point for fishing mortality 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
NWWG	North-Western Working Group (within ICES)
SSB	Spawning stock biomass; total weight of all sexually mature fish in the stock
SSB _{MGT}	Management elected SSB target/limit; usually specified in FMP
SSB _{trigger}	SSB level that acts as a trigger when the stock fall below a certain level
TAC	Total Allowable Catch
UN	United Nations
VMEs	Vulnerable Marine Ecosystems
VMS	Vessel Monitoring System

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

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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 Icelandic summer spawning herring (*Clupea harengus*) 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 purse seine nets, pelagic trawls and other legal fishing gears to fish for Icelandic summer spawning herring 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
18 th January 2018	Assessment Announced
18 th January 2018	Notice of Assessment Team
13 th – 15 th February 2018	On-site meetings
August 2018	Provisional scoring by Assessment Team
24 th August 2018	Requests for Clarification Issued
20 th December 2018	Non-conformance #1 issued
14 th January 2019	Request for extension to deadline for providing Corrective Action Plan (CAP)
25 th January 2019	Request for further extension to deadline for providing CAP
15 th February 2019	Corrective Action Plan submitted
April 2019	Report sent for Peer Review
20 th and 22 nd August 2019	Certification Committee and Determination
23 rd August 2019	Final Assessment Report and Determination

iii. Assessment Team Details

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1. Introduction

This assessment of Icelandic summer spawning herring (*Clupea harengus*) 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, the Icelandic Summer Spawning Herring commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls and indirectly by gears from other Icelandic fisheries legally landing herring, 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:	8 th February 2010
Correspondence Address:	Landssamband smábátæigenda
Street:	Hverfisgötu 105
City:	101 Reykjavik
Country:	Iceland
Postal Code:	IS-101
Phone:	(354) 552 7922
Web:	www.smabatar.is
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3. Background to the Fishery

3.1. Target Species – Atlantic herring (*Clupea harengus*)

3.1.1. Species Range

The Atlantic herring (*Clupea harengus*) is a member of the Clupeidae family of pelagic fishes which includes sprats, pilchards, anchovies and shads. The herring is a pelagic species which is widespread in its distribution throughout the shelf sea areas of the temperate North Atlantic (Figure 1).

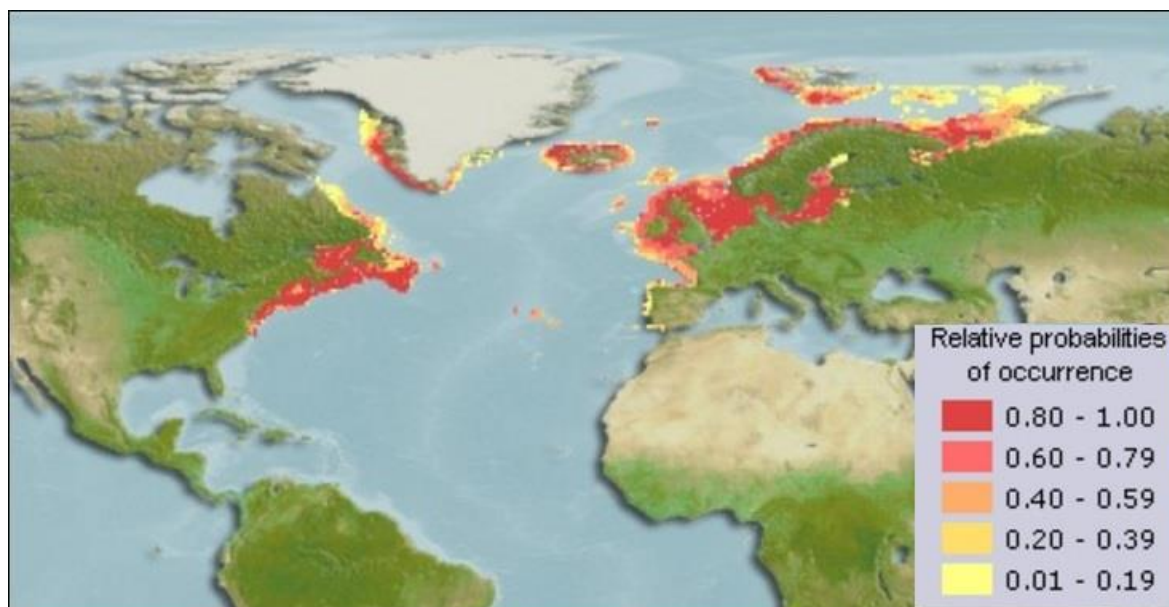


Figure 1. Atlantic herring (*Clupea harengus*) range (Source: FishBase)

3.1.2. Stock Structure

Within the North Atlantic numerous distinct herring stocks exist, differing spatially and temporally in terms of their spawning behaviours and migration patterns. Herring stocks in the North Atlantic are split into many stocks, based on where and when they spawn. There are currently two herring stocks fished in Icelandic waters, Atlanto-Scandian herring (also known as Norwegian spring spawning herring) and Icelandic summer spawning herring with a third stock, Icelandic spring spawning herring, that was also historically fished commercially.

Norwegian Spring-spawning (NSS) herring (Atlanto-Scandian (AS) herring)

Historically, the largest herring stock in Icelandic waters is the Norwegian Spring-spawning or Atlanto-Scandian herring; while this stock is known locally as Norwegian-Icelandic Spring Spawning herring, for the sake of clarity it will be referred to in this report as Atlanto-Scandian herring (AS herring). Historically, after spending their early years, until they are sexually mature at the age of 4 to 6, along the coast of northern Norway, Russia and in the Barents Sea, AS herring undertook large scale feeding migrations to the waters north and east of Iceland. During winter the stock condensed into large schools in the waters east of Iceland before migrating to its Norwegian spawning grounds in spring. Precise migration patterns do however change with oceanographic conditions, stock size and stock composition. Nowadays, AS herring appear in Icelandic waters, but are mostly separate from the Icelandic summer spawning herring (Figure 2).

The AS herring stock is managed via a multi-state management system with overall TACs being set and apportioned based on past agreements. Apportionment agreements are based on distribution of the stock, historical catches, contribution to scientific research and the nation's dependency on fisheries. In 2015 Icelandic landings were around 42,625 t while estimated total landings were 328,740 t. Overall catches in recent years have exceeded advised TACs due to lack of agreement among the coastal states on the allocation of the quota.

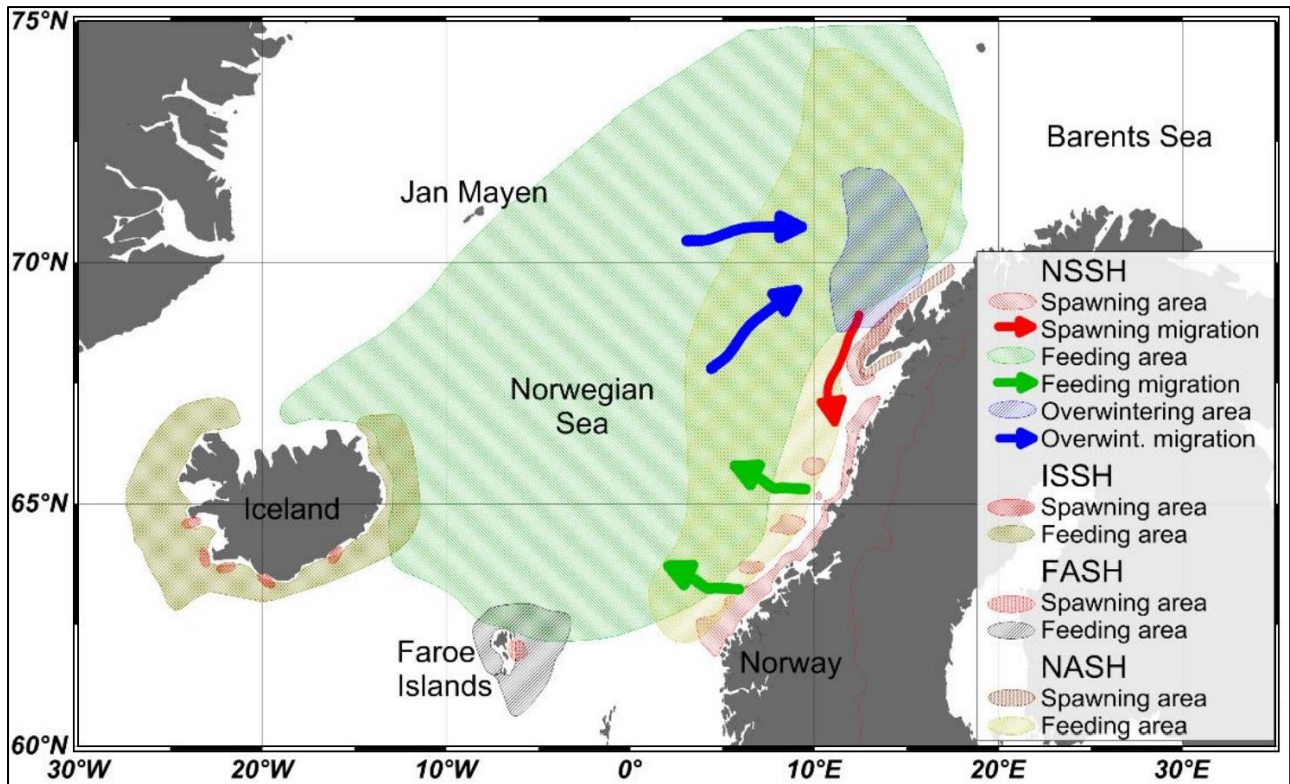


Figure 2. Current migration pattern of the adult part of the AS herring stock and interactions with other NE Atlantic stocks (Icelandic summer-spawning herring (ISSH), Faroese autumn-spawning herring (FASH), and Norwegian autumn-spawning herring (NASH)) (Source: Pampoulie *et al.* 2015).

Icelandic summer spawning (ISS) herring

The Icelandic summer spawning herring under assessment in this report differs from the AS herring stock in that it is a coastal stock that does not leave Icelandic waters which spawns in summertime (July). In recent years, these two stocks have had quite separate distribution patterns and generally do not mix in Icelandic grounds, although previously they shared similar feeding grounds in early summer, north or east of Iceland, and distribution overlapped again in 2017 (see figure 43).

Following the appearance of strong year classes in 1999 – 2002, the spawning-stock of ISS herring reached its highest estimated level in the late 2000s. SSB then declined rapidly as a result of high natural mortality caused by *Ichthyophonus* infection.

At its peak in the late 2000s, the ISS herring stock provided the majority of Icelandic herring catches with catches exceeding 150,000 t in 2007 and 2008; catches in 2010 fell as low as 43,500 t, the second lowest in the time-series and the lowest since 1986. Landings of Icelandic summer-spawning herring during the 2014/2015 fishing season amounted to 95,000 t.

Icelandic spring spawning herring

Historically, the third major herring stock in Icelandic waters was the Icelandic spring spawning herring. The life cycle of this stock was quite similar to that of the AS herring stock except that it spawned locally in Icelandic waters and did not migrate to Norwegian waters to spawn. The Icelandic spring spawning herring stock collapsed in the late-1960s, and never recovered.

3.1.3. Species Biology

Herring are pelagic zooplankton feeders, mostly feeding on copepods *Calanus finmarchicus* (Figure 3). They are commonly between 30 and 40 cm in length; the largest herring measured in Icelandic waters was 46.5 cm. Icelandic herring are long-lived, reaching up to 25 years of age, first appearing in catches at age 3, with age groups 4 to 6 generally making up the bulk of catches.



Figure 3. Atlantic herring (*Clupea harengus*) (Source: <http://www.fisheries.is>).

Herring are multispawners, meaning they spawn multiple times in their life time, that generally spawn in shallow waters in spring or summer. Herring are unique amongst commercial fish species in that they produce eggs which are attached to benthic, usually firm gravely, substrates. The need for suitable substrates to which eggs can attach limits spawning to small spatially discrete areas.

3.1.4. Ichthyophonus infection

The outbreak of *Ichthyophonus* infection in the ISS herring stock started in 2008. *Ichthyophonus* is a genus of unicellular eukaryotic parasites of fish. *Ichthyophonus* has low host specificity, with records from over 80, mainly marine, species of fish including haddock (*Melanogrammus aeglefinus*), plaice (*Pleuronectes platessa*) and Atlantic herring. Despite its wide geographic distribution and broad host range, reports of epidemics associated with high mortality are restricted to Atlantic herring and have been linked to significant decreases in population sizes. While the infection is common in Pacific herring (*Clupea pallasii*), outbreaks causing significant mortality have not been reported.

Infection occurs by oral intake of *Ichthyophonus* spores present in the environment. Prevalence of *Ichthyophonus* infection in the 2003 – 2006 year classes is still high or 30 – 40%, while in the 2007 – 2009 year classes the rate has been increasing in the last two years. While new infection had hardly been seen since 2011, evidence of new infection was detected in age 2 herring north of Iceland during the winter of 2015/2016; therefore, it is evident that new infection is occurring however, this is at a lower rate than in 2009 – 2010. Results of research to date indicate that mortality due to *Ichthyophonus* infection is not as high as previously thought.

3.1.5. Mass mortalities

During the winter of 2012/2013, two incidents of mass mortalities of ISS herring, unrelated to *Ichthyophonus* infection, took place on the stock's main overwintering grounds. During that winter the herring stock overwintered in Kolgrafafjörður, a small fjord in the north-west of Iceland. Routine acoustic measurements on 30th of November and 12th of December 2012 indicated that around 300,000 t of herring were present in the inner part of the fjord.

On the 14th of December 2012 and again on 1st February 2013 two mass mortality events occurred in the inner part of the fjord resulting in the deaths of an estimated 175 million herring, representing a biomass of 53,000 t (or 12% of the estimated SSB₂₀₁₂). The mass mortalities most likely resulted from low oxygen concentration in some areas of the inner part of the fjord (Óskarsson *et al.*, 2013). Similar incidents cannot be excluded in the future should the herring again decide to overwinter in Kolgrafafjörður, or another similar fjord.

3.2. Fishery Location

As previously discussed, ISS herring are a coastal stock that complete their life cycle within the confines of the Icelandic EEZ. As such only those areas within the boundaries of the Icelandic EEZ (i.e. the area in green in Figure 4) are covered in detail in this assessment and ultimately only catches from this area would be eligible for Certification.

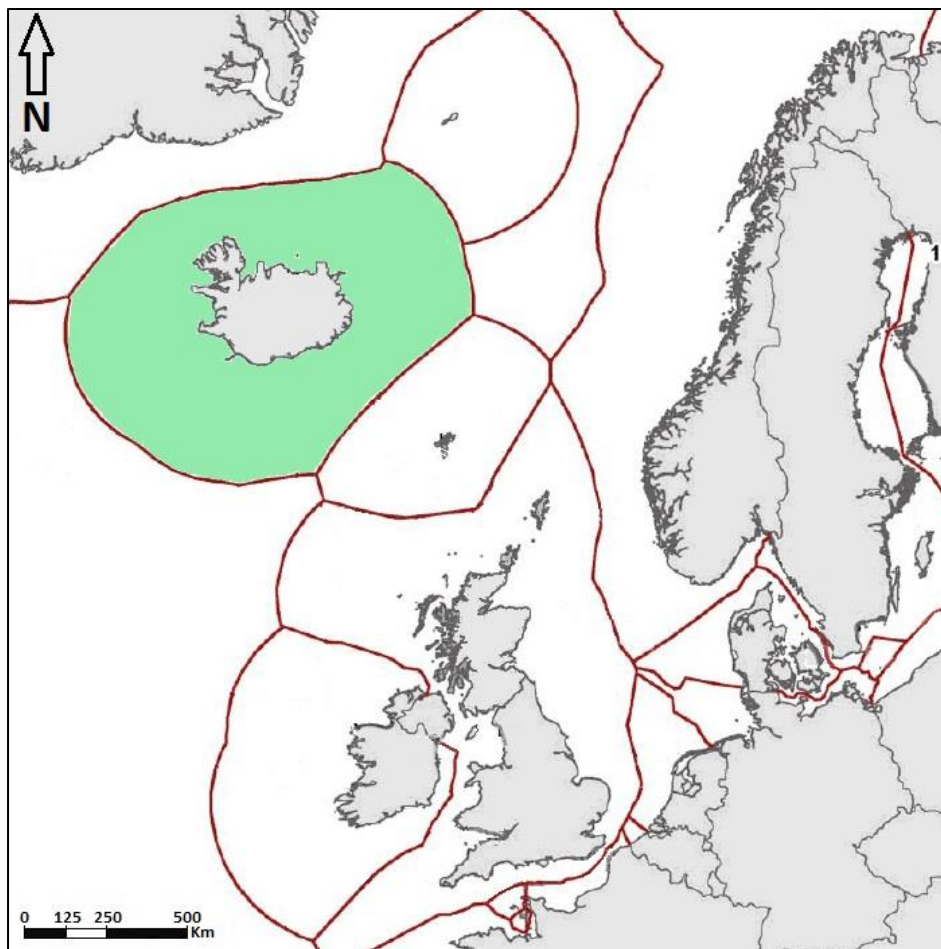


Figure 4. Icelandic EEZ from which catches would ultimately be eligible for Certification.

From 2006 to 2013 the ISS stock overwintered primarily in a small coastal area west of Iceland (Figure 5) and it was in this area that fishing took place; in the previous three decades catches had mainly come from more easterly and/or offshore areas. In the 2014/2015 and 2015/2016 fishing seasons the majority of catches were taken offshore to the west of Iceland (Figure 5). In recent years, the shift in distribution from a highly aggregated to a more dispersed overwintering stock has led to the majority of landings in these years coming from trawls whereas previously purse seines had contributed the majority of landings.

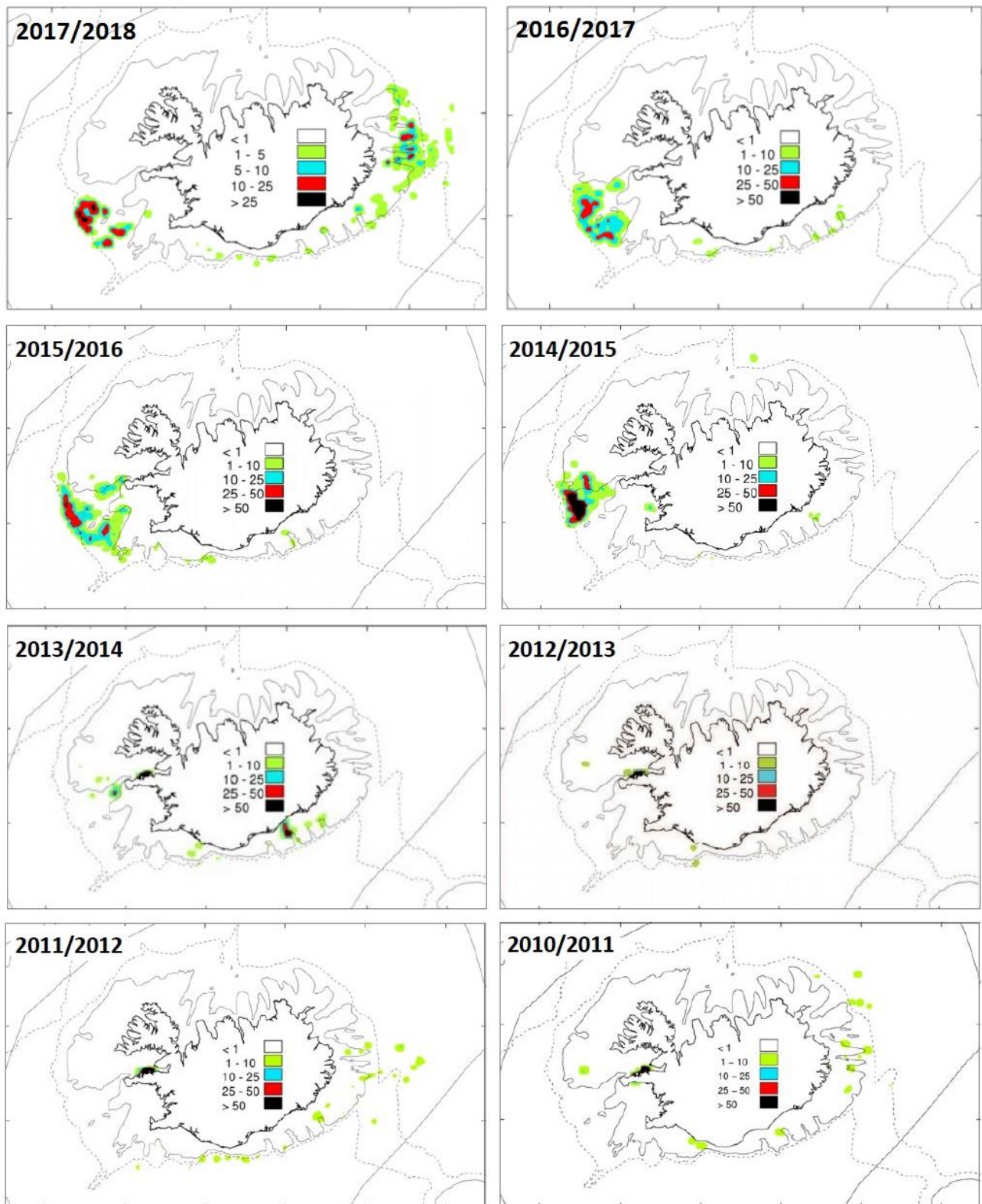


Figure 5. Spatial distribution of catches (t/nmi²) of Icelandic summer spawning herring in the 2010/2011 to 2017/2018 fishing seasons (Source: MRI reports).

3.3. Fishing Gears used in the Fishery

Two fishing gears contribute the vast majority of herring landings, pelagic trawls and purse seines; as previously discussed, vessels switch between both based on the spatial distribution of herring in any particular season. In years where herring are highly aggregated they are targeted primarily with purses seines and when they are dispersed over a wider area they are targeted primarily with pelagic trawls. Until the mid-1980s driftnets accounted for a significant portion of catches but this decline after 1985 (Figure 6). In some years, depending on the distribution of herring and the availability of a market for catches, a small boat gillnet fishery is still prosecuted which generally accounts for around 800 t of herring (Figure 6).

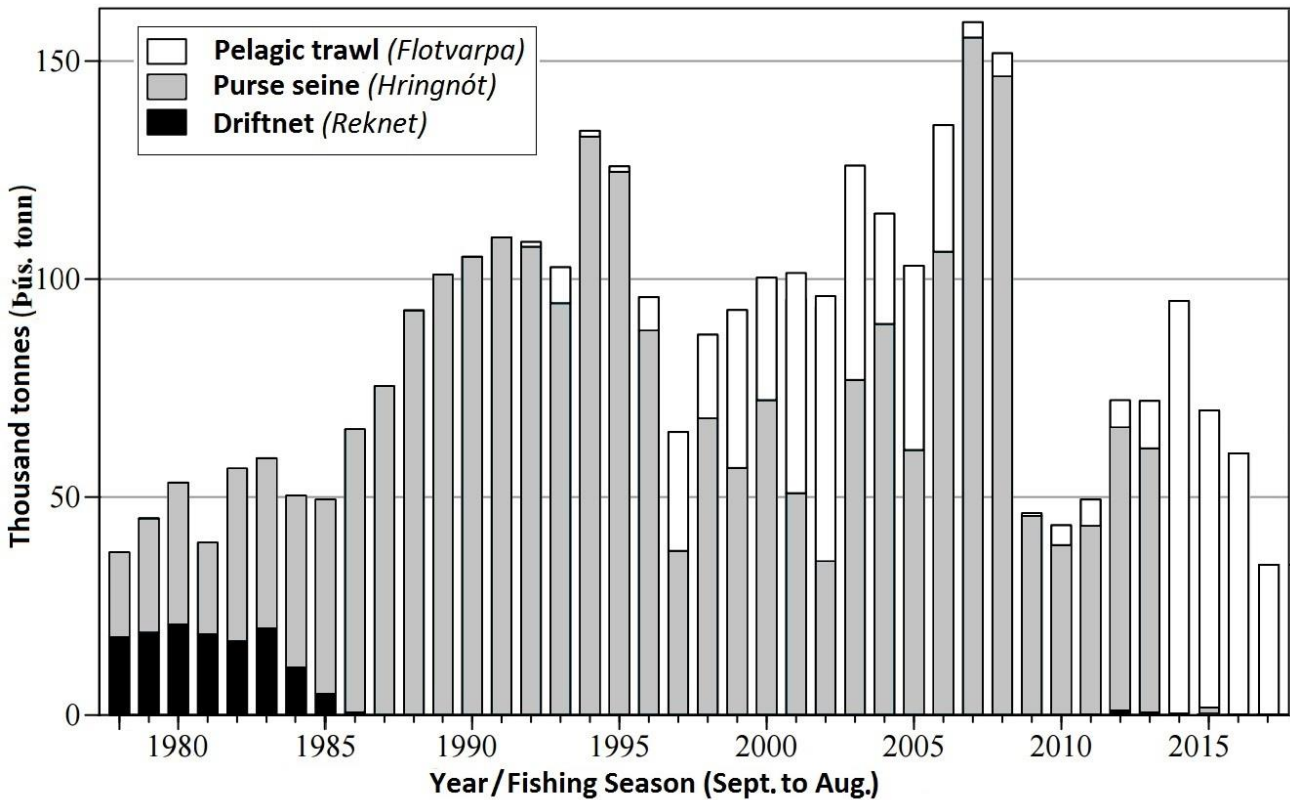


Figure 6. Landings by gear type since 1978 (annual prior to 1991 and by fishing season from 1991 to present) (Source: MRI).

3.3.1. Pelagic Trawling

When trawling for pelagic species a vessel first locates a target shoal(s) using specialised pieces of equipment known as fishfinders. The vessel then shoots its trawl, pays out an appropriate lengths of trawl wire (warp), and steams towards the target shoal (Figure 7). Pelagic trawls are towed at the appropriate level in the water column to intercept shoaling fish such as herring or sprats. The depth of net relative to the surface is indicated by a net monitor or net sounder mounted on the net headline and gear depth is controlled by changing the length of warp and/or altering towing speed.

Single boat pelagic trawls are spread horizontally by the hydrodynamic forces generated by specialised otter boards while floats on the headline, a weighted footrope and heavy weights on each lower bridle maintain the net’s vertical spread. Net gape is continuously monitored by a netsounder. The specialised otter boards (trawl doors) used by pelagic trawlers are hydrodynamically efficient and provide not only high horizontal spreading forces but also increased lift with increasing towing speed; this allows a vessel to raise its net when aiming for a shoal of fish.

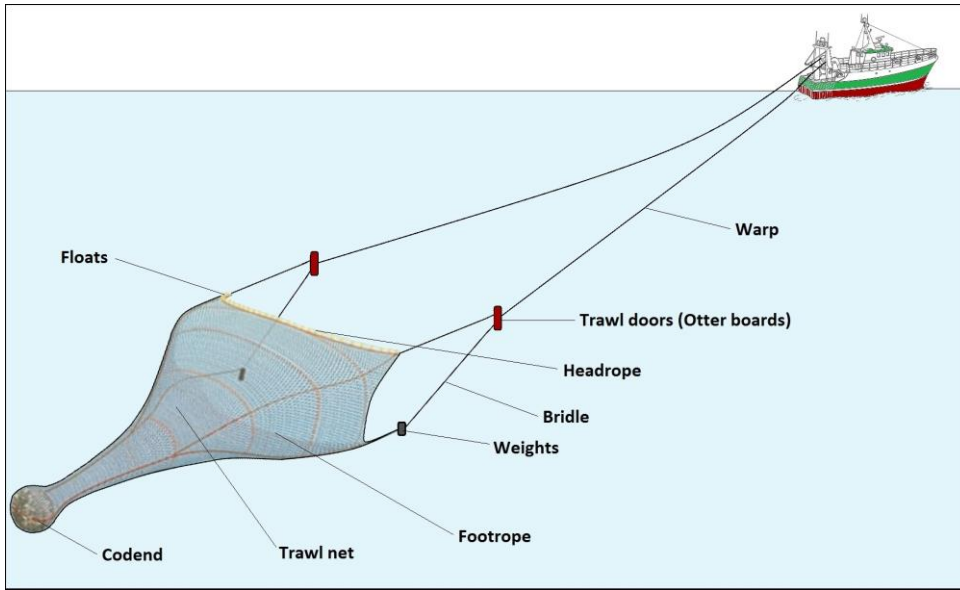


Figure 7. Schematic of a single boat pelagic trawl.

3.3.2. Purse-seine

Herring purse seining is often carried out at night when they are more likely to form denser shoals close to the surface of the water and within range of the purse seine gear. As with pelagic trawls a purse seiner first locates a target shoal using its fishfinder(s) before shooting its net in a circle, surrounding the target shoal with a deep curtain of netting. The top of the seine is maintained on the surface by floats while small lead weights on the underside of the curtain ensure that the bottom of the net (leadline) sinks quickly surrounding the target shoal. The net is then “purse” (closed) under the shoal by heaving on the purseline which runs through steel rings attached to the lower edge of the net (Figure 8).

When the net has been pursed and fish can no longer escape, it is hauled lengthwise until the fish are packed tightly in the last remaining section of the net, known as the bunt. The catch is then pumped or brailled aboard the vessel. A large purse seine can be up to 1 km long and 200 m deep. Purse seiners generally try to avoid bottom contact as the small mesh nylon netting is easily damaged.

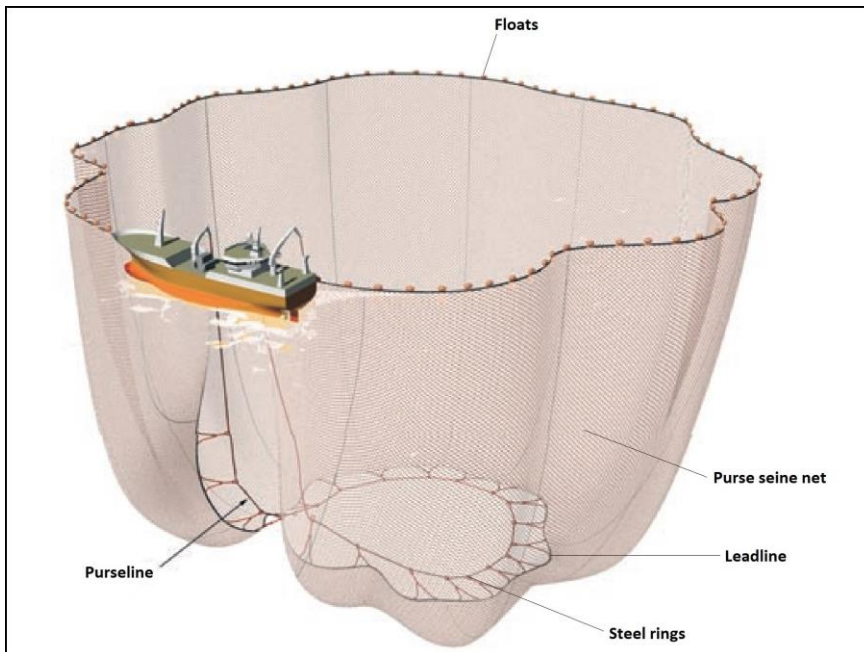


Figure 8. Schematic of a purse seine.

3.4. Historical Background to the Icelandic Herring Fisheries

Herring stocks in the Northeast Atlantic have sustained small scale coastal fisheries for centuries. Prior to the First World War (1914 – 1918), Icelandic herring catches were less than 30,000 t. After the First World War catches gradually increased to in excess of 200,000 t annually. At this time catches were mostly confined to local Icelandic herring stocks. Icelandic herring catches declined following the Second World War (1939 – 1945) before increased rapidly after 1960 as technology improved. These technological improvements included the introduction of power blocks which enabled the boats to haul larger catches and sonar which allowed them to easily locate herring shoals in deep waters. In Iceland catches of ISS herring increased rapidly in the early 1960s due to the development of a purse-seine fishery off the southern coast of Iceland resulting in a rapidly increasing exploitation rate. In the late 1960s Icelandic herring catches peaked at in excess of 600,000 t, with the majority coming from the AS herring stock. The majority of Northeast Atlantic herring stocks including the three major Icelandic stocks of the time, the AS herring, ISS herring and Icelandic spring spawning herring, collapsed almost entirely as a result of a combination of high annual catches and unfavourable oceanographic conditions.

The collapse of the herring fisheries was a major setback for the coastal economies all across Northern Europe which depended on these fisheries. After the collapse, a near moratorium was established on Icelandic herring fisheries including an outright fishing ban on ISS herring from 1972 to 1975. As the stock recovered the moratorium was partially lifted in 1976 with limited fishing being allowed under a quota system. In 1979 a system of Individual Transferable Quotas (ITQs) was introduced into the herring fishery. This ITQ system was extended to the main Icelandic groundfish fisheries in 1984 and is now an important component of the Icelandic fisheries management system.

Total catches of AS herring remained below 20,000 t annually until 1984, after which they increased to around 100,000 t annually from 1986 to 1992 before several large recruitments in the late 1980s and early 1990s led to the rapid rebuilding of the stock with catches increasing to 1.5 million t in 1997 (Figure 9). In 1994 the Icelandic fishery for AS herring resumed with annual catches since the resumption of the fishery fluctuating between 100,000 t and 200,000 t annually, although in recent years Icelandic catches of AS herring have been less than 100,000 t. As the size of the AS herring stock increased, AS herring began to again undertake large-scale migrations into Icelandic waters. As before the majority of overall catches of AS herring are taken outside Icelandic waters, however, in recent years Icelandic catches of AS herring have generally been taken in Icelandic waters.

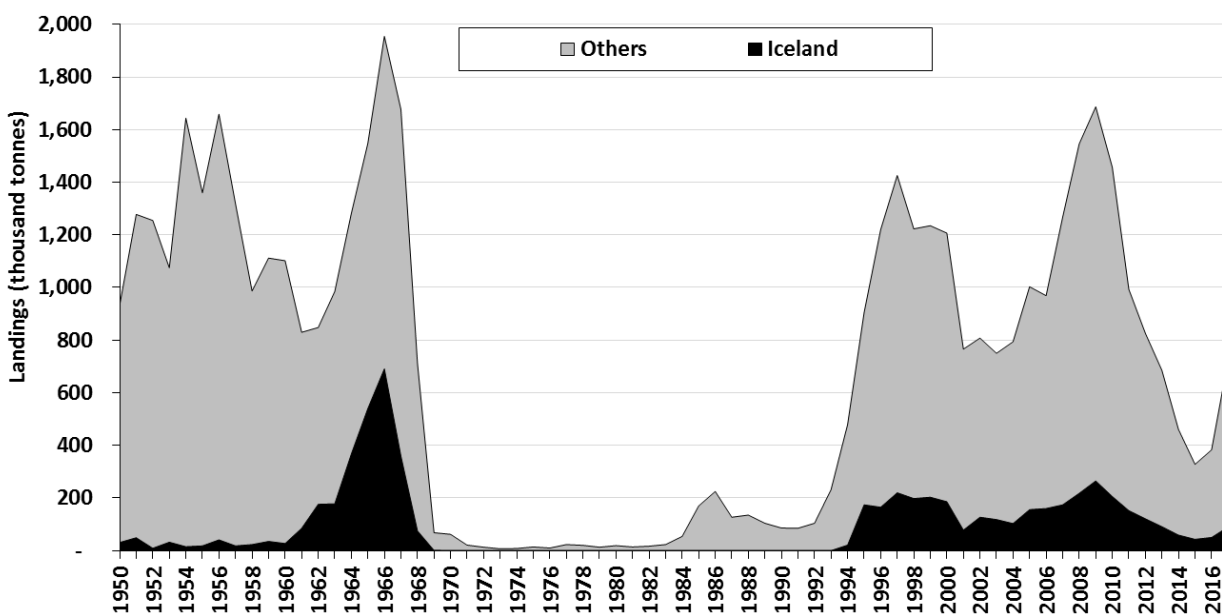


Figure 9. Total catches of Norwegian Spring-spawning (Atlanto-Scandian) herring in North-eastern Atlantic Ocean (1950 to 2017) (Source: Data from MFRI reports and website).

Historically the ISS herring stock has always been much smaller than the AS stock and, while the stock also collapsed in 1967, it was faster to recover than the AS stock and by 1980 catches of ISS herring were again over 50,000 t annually (Figure 10). In the late 2000s the ISS herring stock reached record high levels for the time series (1987 – 2015)), with an estimated SSB of almost 800,000 t in 2008. However, as discussed previously the stock then declined as a result of Ichthyophonus infections.

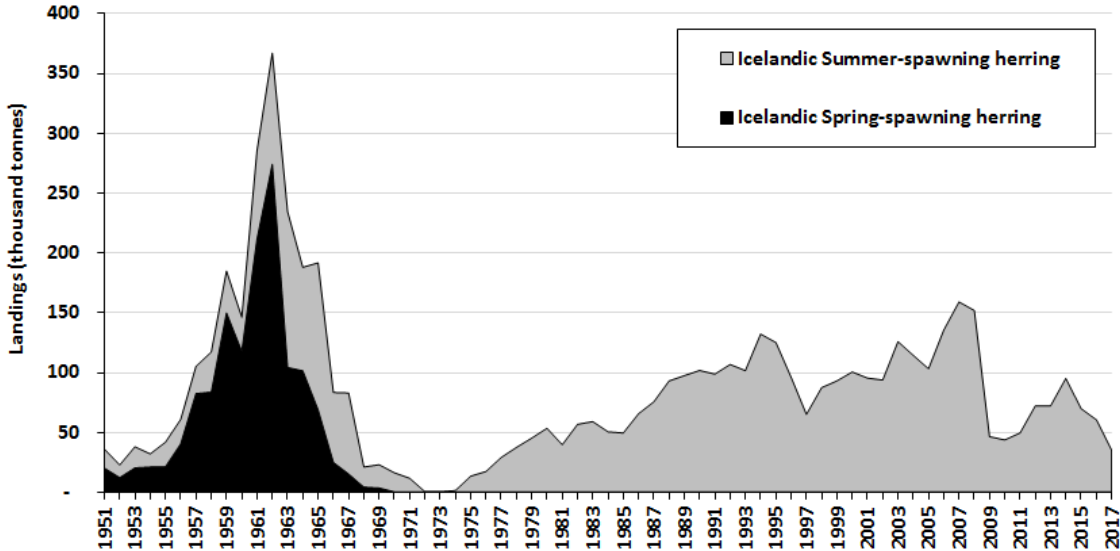


Figure 10. Total catch of Icelandic summer and Icelandic spring spawning herring in Icelandic waters (1950 to 2017) (Source: http://dt.hafogvatn.is/astand/2018/30_sild.html).

The third major herring stock in Icelandic waters was the Icelandic spring spawning herring collapsed at the same time as the AS and ISS herring stocks in the late-1960s. However, unlike the AS and ISS herring stocks the Icelandic spring spawning herring never recovered (Figure 10).

Historically, the Icelandic herring fleet consisted of multi-purpose vessels, mostly under 300 GRT, operating purse-seines and driftnets. In recent years, larger vessels, some in excess of 3,500 GRT, have entered the fishery. These are generally combination purse-seiner/pelagic trawlers which switch between the major pelagic fisheries, herring, capelin, mackerel and blue whiting throughout the year (Figure 11). These switches between fisheries are dictated primarily by the availability of quota, the spatial distribution of the various species and market demand.



Figure 11. An example of a large combination purse-seiner/pelagic trawler in the Icelandic fleet operated by HB Grandi (Vikingur AK 100; built 2015; 81 m LOA; 3,672 GRT) (Source: <http://www.hbgrandi.com/>).

3.5. Fisheries Management System

ISS herring are considered to be a local stock; as such the stock is managed solely by the Icelandic authorities, although scientific advice 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 the Icelandic summer spawning herring stock. For more than 30 years the policy has been to manage the fishery at $F = F_{0.1}$. The target is considered by ICES to be consistent with the MSY approach (ICES, 2013a); although it has been exceeded in some years, mainly due to over-estimation of stock size at the time. Precautionary and MSY reference points have been defined for the stock and approved by ICES.

The Minister of Fisheries and Agriculture determines the Total Allowable Catch (TAC) of ISS herring 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 herring apply from 1st September to 1st May the following year with catches generally being taken from September to February. As previously the overall TAC is apportioned according to a system of Individual Transferable Quotas (ITQs) which has been in place since 1972, having been introduced in the wake of the stock's collapse. 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 publicly 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.

3.6. Stock Assessment Methods and Practices

The assessment of Icelandic summer spawning herring (ISSH) stock is done annually by the ICES North-Western Working Group (NWWG). The assessment is used by the advisory committee (ACOM) at ICES, to formulate the formal international advice. This process ensures transparency and international acceptance and quality control. The Marine and Freshwater Research Institute in Iceland (MFRI) is the advisor for the Ministry of Industry and Innovation that is responsible for Icelandic fisheries management. The MFRI provides data to ICES and participates in the assessment in NWWG and in the advisory process in ACOM. Normally, the advice from MFRI will be in accordance with that of ICES.

Results from various researches including tagging experiments around the middle of last century, studies on larval transport, and studies on migration pattern and distribution, all suggest that the stock is local to Icelandic waters. Accordingly, the Icelandic data that go into the stock assessment, which are catch statistics and acoustic survey results, as well as biological samples from the Icelandic fishery and surveys, cover the stock and the fishery.

A special problem with Icelandic Summer Spawning Herring is several outbreaks of an epizootic caused by *Ichthyophonus hoferi*. This organism is now regarded as a protozoa of the class Mesomycetozoa, previously it used to be classified as a fungus. Outbreaks last a few years and mostly hit the younger ages, with necrotic pustules in muscular tissue and in particular in the heart. Infection occurs by oral intake of *Ichthyophonus* spores, but is not clear how they are transmitted. The disease occurs in many fish species and causes disease of varying severity. It is not dangerous for warm-blooded animals, including humans, but the quality of the herring may be reduced. Previously, it was assumed that all diseased herring would die from the disease. Now, scientists at MFRI have clarified that only about 1/3 of fish with visible signs of infection will die (Guðmundur J. Óskarsson, Jónbjörn Pálsson and Asta Gudmundsdóttir). An ichthyophoniasis epizootic in Atlantic herring in marine waters around Iceland. Canadian Journal of Fisheries and Aquatic Sciences in press 2018). The natural mortality associated with the observed prevalence of disease manifestations (lesions and granulomas) is now estimated in the order of 0.2 - 0.3 in disease periods, while the standard assumed natural mortality is 0.1. The recent harvest control rule was designed to tolerate periods with such additional mortality.

The data that are included in the assessment, and the method for calculating the stock abundance and exploitation rates are documented by NWWG in the stock annex for the stock. This stock annex is updated and approved in benchmark assessments and documents the procedures to be followed. The data that are used in the assessment are yearly catches in numbers at age and acoustic estimates of stock numbers at age in a survey that is conducted in the winter each year, in addition to weights at age and maturity at age. The assessment is restricted to the years 1987 - present, and ages 3 - 13.

Information about landings of the fishery fleet is collected by the Icelandic Directorate of Fisheries. The primary source is reported landings in the harbours (the official landing). Logbooks that provide information about timing (day and time), location (latitude and longitude), fishing gear, catch size, and species composition in the catch of each fishing operation for each vessel are primarily used for control purposes, but the information is accessible for MFRI.

Biological samples from the catch are taken at sea by the fishermen or in the harbours by people from MRI and/or inspectors from the Directorate of Fisheries, according to a detailed sampling protocol. The samples are analysed by MFRI (at least the fish length, weight, age (from scales), sex, maturation, and weight of sexual organs are recorded). Samples are also taken at surveys. Both are used for constructing age-length keys. The annual estimates of catch at age are obtained by applying age-length keys to length distributions. The annual landings are partitioned into strata according to the fishing length measurements within each stratum. The number of strata used in the calculation each year depends on the spatial and temporal distribution of the fishery, the fishing gear used and intensity of biological sampling, and has ranged from 3 to 10 during the years 2004 to 2014. The number of samples and the number of fish aged varies considerably between years but is regarded as sufficient by MFRI (Confirmed at site visit, 13 Feb. 2018)

Discards are illegal in Icelandic waters. Normally, discards are considered to be insignificant in the fishery of ISSH. There are few exceptions in the past 35 years where discards were estimated to be significant, in years with large year classes entering the fishery where juveniles were numerous in the catch. Surveillance by inspectors from the Directorate of Fisheries during each fishing season is considered adequate to verify ongoing discard (Confirmed at site visit, 13 Feb. 2018).

The acoustic survey that is used in the assessment has been conducted in October-December and/or January. The survey area varies spatially as the survey is focused on the adult and incoming year classes. The surveyed area is decided on the basis of all available information on the distribution of the stock in previous and the current year, which include information from the fishery.

Other acoustic surveys exist, but only with broken time series.

The assessment method used is NFT-ADAPT (VPA/ADAPT version 3.3.0 NOAA Fisheries Toolbox). This kind of assessment tool calculates the historical stock numbers by year class as the sum of what is a) needed to account for subsequent catches from the year class, b) an assumed fraction that dies from other causes (natural mortality), and c) what remains of the year class at present. The remaining stock numbers are obtained by comparing recent and past survey results, calibrated by fitting survey data to catch-derived stock numbers. This kind of method has a long history and is still widely used. For Icelandic Summer Spawning Herring, variants of it have been used since 2005. The last benchmark assessment was in 2011. Newer methods were considered, but the present method functions well and the results with various methods are fairly similar.

The recent finding that the mortality caused by *Ichthyophonus* is lower than previously assumed led to a revision of natural mortality estimates in the 2017 assessment. The historical estimates of stock abundance and recruitment were adjusted downward in the 2017 assessment, partly because of this, partly because of new catch and survey data. The estimates of the abundance, recruitment and fishing mortality as well as the analytic retrospective error in the most recent assessment is shown in Figure 12.

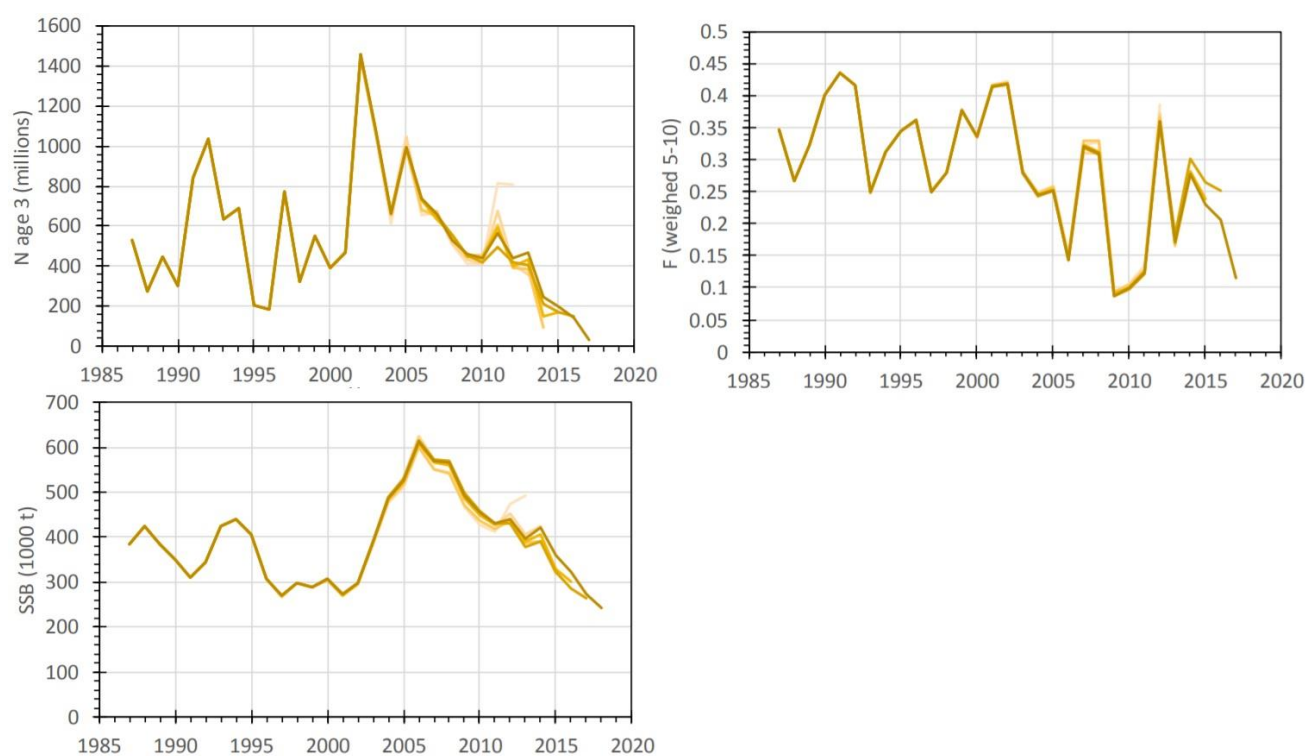


Figure 12. Assessment results and retrospective assessment error, according to the 2018 assessment (Source: https://www.hafogvatn.is/static/extras/images/sild-ICES_NWWG_loka729473.pdf).

When calculating quota advice in years where *Ichthyophonus* was evident, a percentage loss similar to the infestation rate was previously assumed in predictions. This was under the assumption that all infected fish would die. Recent work has clarified that only about 30% of the infected fish will die. From 2013 onwards, it was therefore decided to ignore the estimates of the infection prevalence in the stock projection. The previous practise was however reinstated in 2017 because of intense new infection in the stock.

For more than 20 years the practice has been to manage fisheries on this stock at $F = F_{0.1} = F_{MSY} (= 0.22 = F_{pa})$. Formal management strategy evaluation took place in April 2017 where several rules were tested and found acceptable (ICES 2017b), including the rule that was finally adopted. This rule has a quite low target harvest rate (15% of the 4+ biomass) which is reduced below a break-point of 200 000 tonnes. This low harvest rate, which corresponds to a fishing mortality of approximately 0.18, was preferred as it would remain precautionary even in periods with *Ichthyophonus hoferi* disease.

Precautionary and MSY reference points were revised in connection with the management plan evaluation. No changes were proposed to previous values.

3.7. Biomass, Landings and Stock Development

The abundance of Icelandic Summer Spawning Herring has varied substantially over the years (Figure 13). The catches increased rapidly in the early 1960s due to the development of the purse seine fishery off the south coast of Iceland. This, perhaps combined with unfavourable environmental conditions, resulted in a rapidly increasing exploitation rate until the stock collapsed in the late 1960s. A fishing ban was enforced during 1972–1975. Since then, the ambition has been to apply a low fishing mortality with $F_{0.1}$ (≈ 0.22) as guidance. For long periods, the assessment tended to overestimate stock and underestimate mortality, so the fishing mortality generally was considerably higher. Nevertheless, throughout the 1980ies, stock abundance and annual catches increased gradually to catches over 100 000 t.

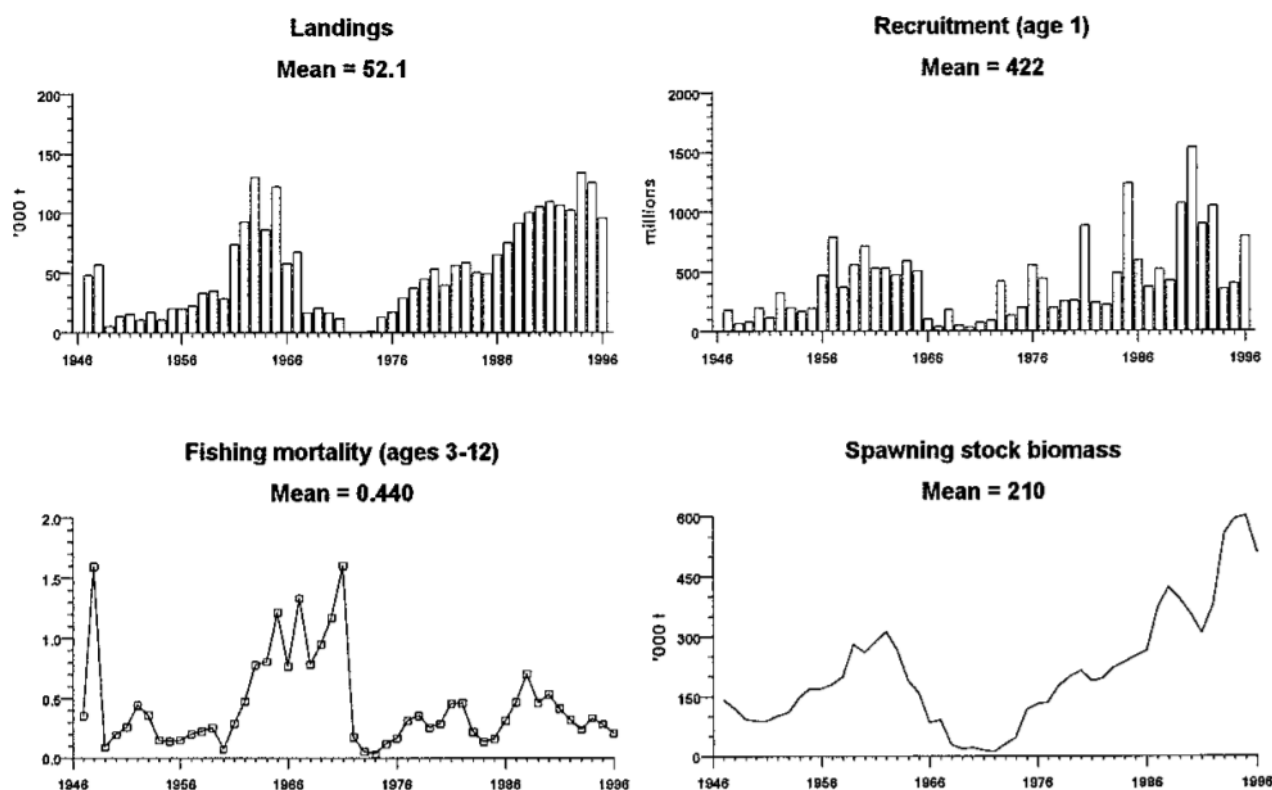


Figure 13. Long term history of stock abundance, recruitment, mortality and landings, as estimated in 1997¹.

Since its recovery the ISS herring stock has generally supported landings of between 50,000 t and 150,000 t annually (Figure 10) with annual catches fluctuating according to year class strength and disease outbreaks. Good recruitment in 1999 – 2002 (Figure 14 left) resulted in a record high SSB in 2005 – 2008 (Figure 14 right) before the stock declined rapidly as a result of high natural mortality caused by *Ichthyophonus* infection and a gradual decline in recruitment. The continued reduction in SSB in recent years is due to a declining trend in recruitment.

In the beginning of the century, there was some years with very high recruitment. Recruitment subsequently underwent a gradual decline with knock on declines in SSB. As of the latest assessment, the 2005 – 2015 year classes were estimated to be average or small. The 2016 year class, however, is estimated to be above average.

1 [http://ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20\(CRR\)/crr223/CRR223-1.pdf](http://ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/crr223/CRR223-1.pdf)

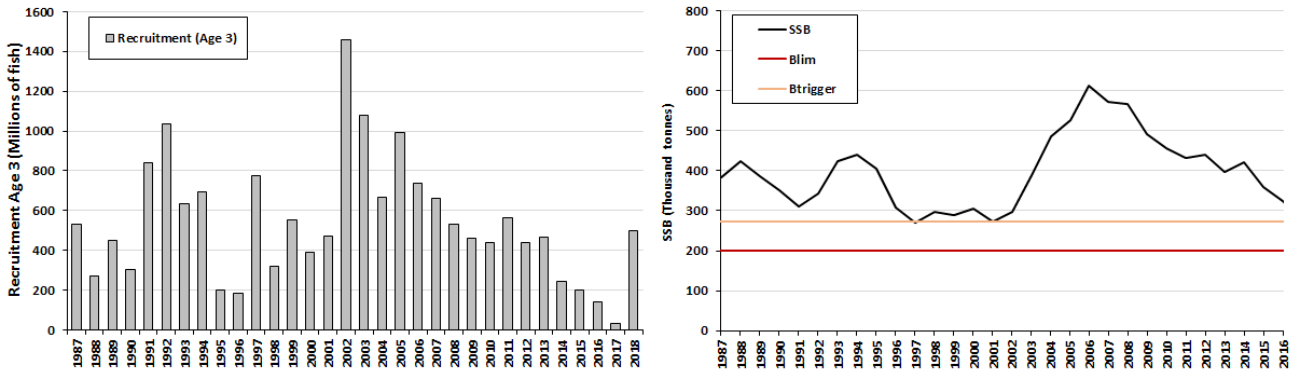


Figure 14. Recruitment (Age3) (left) and SSB (right) (Source: http://dt.hafogvatn.is/astand/2018/30_sild.html).

The latest assessment indicates a minor increase in SSB if the management plan will be followed in 2019. There is uncertainty about stock development as a result of poor estimates of incoming year class strength from the acoustic survey and Ichthyophonus infection in the youngest cohorts. Since the early-2000s fishing mortality has reduced and has fluctuated around a relatively stable mean. Fishing mortality was low during the early years of Ichthyophonus infection, but increased thereafter to above F_{MSY} before falling back below F_{MSY} in recent years (Figure 15).

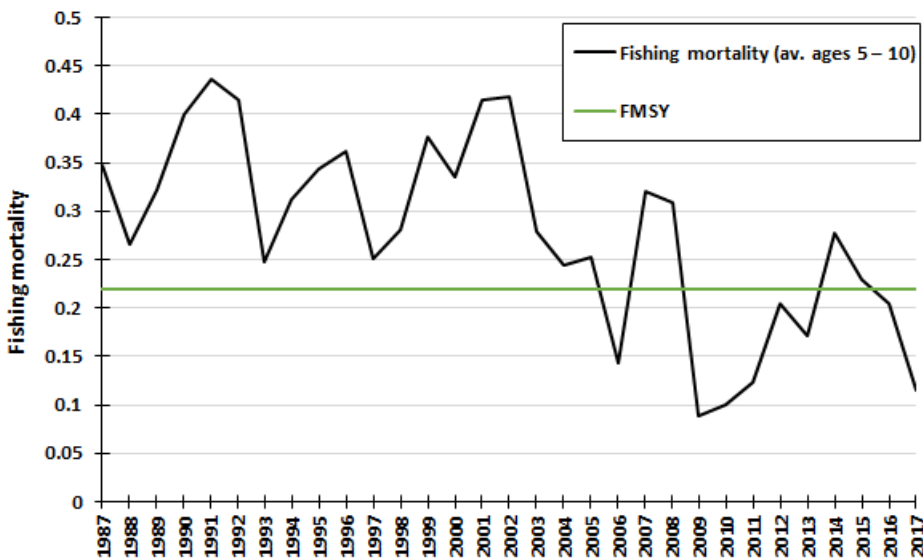


Figure 15. Fishing mortality (average for ages 5 – 10) (Data source: MRI).

In the absence of a formal management plan, the practice for several decades had been to derive the recommended TAC from the assessed stock abundance according to a fishing mortality of $F = 0.22$. The resulting fishing mortality has been higher in some years, due to retrospective error in the assessment at various stages, managers' occasional deviation from advised TACs, and catches deviating from the TAC (Figure 16); however these TAC overshoots are balanced by interannual transfers of quota.

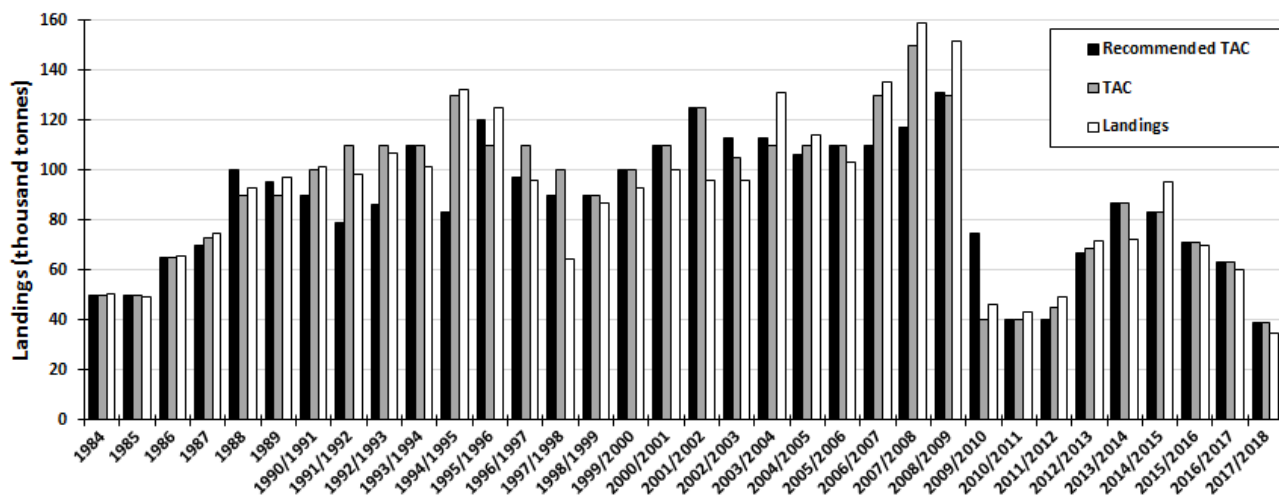


Figure 16. Overview of recommended TACs, agreed TACs and catches of ISS herring. Annual prior to 1990 and by fishing season from 1990 to present (Source: ICES and MFRI).

4. Proposed Units of 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 2 below.

Table 2. Proposed Units of Certification (UoCs).

Common across all UoCs			Unique to each UoC	
Species	Location of Fishery	Principal Management Authority	UoC	Gear Type
Atlantic herring (<i>Clupea harengus</i>) Icelandic summer spawning herring stock	Iceland 200nm EEZ within	Ministry of Industries and Innovation (Iceland)	1	Purse seine net
			2	Pelagic trawl
	FAO Major Fishing Area 27		3	Gears from other Icelandic fisheries legally landing herring

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, including ISS herring, 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 3 provides a summary of the on-site meetings and a description of the key items discussed at each.

Table 3. Summary of Meetings, Icelandic Summer Spawning Herring Commercial Fishery site visits, February 2018.

Meeting Date and Location	Personnel	Areas of discussion
<p>Date: 13/02/2018</p> <p>Time 10:00</p> <p>Location: Reykjavik</p>	<p>Marine and Freshwater Research Institute (MFRI) Guðmundur Þórðarson, Head of Demersal Division Þorsteinn Sigurðsson, Head of Pelagic Division</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <p>General on recent developments:</p> <ul style="list-style-type: none"> ▪ Recent development of assessment and HCRs, MFRI satisfied, unsolved problems etc. ▪ Important developments in other fields for these stocks. <p>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.</p> <p>International cooperation: Arrangements for these stocks. General and on stock identity in particular.</p> <p>Herring-specific:</p> <ul style="list-style-type: none"> ▪ Separation from NSSH in catches and survey measurements - brief review of how that is done. ▪ Recent low recruitment, underlying reasons, time to get worried? ▪ Harvest rule set relatively low to make additional measures when Ichthyophonus appears unnecessary.

Meeting Date and Location	Personnel	Areas of discussion
		<ul style="list-style-type: none"> ▪ Revision of the assessment, expectations re retrospective error going forward. ▪ Protection of juvenile herring. ▪ Quota exchange with other species relevance for herring. <p>Non-target species information</p> <ul style="list-style-type: none"> ▪ Information on status of non-quota species. ▪ Discard prohibition, information on its success, implementation, compliance and enforcement <p>ETP species information</p> <ul style="list-style-type: none"> ▪ 4 vulnerable species identified: Atlantic halibut, common skate, spiny dogfish spurdog, Greenland shark, bycatch data collected on them, e.g. eLogbook, inspector records. ▪ Latest information on ETP stock status (or proxies where not available). <p>Seabirds, Marine Mammals and ETP impact mitigation</p> <ul style="list-style-type: none"> ▪ 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. <p>Habitats</p> <ul style="list-style-type: none"> ▪ 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. <p>Foodweb</p> <ul style="list-style-type: none"> ▪ 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.
<p>Date: 13/02/2018</p> <p>Time 13:00</p> <p>Location: Reykjavik</p>	<p>HB Grandi Ingimundur Ingimundarson, Pelagic Fleet Manager</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <ul style="list-style-type: none"> ▪ 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. ▪ 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).

Meeting Date and Location	Personnel	Areas of discussion
<p>Date: 13/02/2018</p> <p>Time 15:00</p> <p>Location: Reykjavik</p>	<p>Iceland Responsible Fisheries Foundation (IRFF) Finnur Garðarsson</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <ul style="list-style-type: none"> ▪ Development of the IRF Programme. ▪ Development of formal FMPs. ▪ Role of Iceland Responsible Fisheries Foundation in these fisheries. ▪ Particular Industry initiatives for these stocks.
<p>Date: 14/02/2018</p> <p>Time 10:00</p> <p>Location: Hafnarfjörður</p>	<p>Fisheries Directorate Þorsteinn Hilmarsson, Head of Services and information Áslaug Eir Hólmgeirsdóttir, Head of Surveillance</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <p>Management:</p> <ul style="list-style-type: none"> ▪ 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. <p>Management plan documentation:</p> <ul style="list-style-type: none"> ▪ Formal documentation of FMPs, web addresses for official versions of the management plans. <p>Transparency:</p> <ul style="list-style-type: none"> ▪ Use of relevant traditional, fisher and/or community information and/or knowledge. ▪ Ensuring transparency, channels for communication formal and informal. <p>Loss of gear/ghost fishing and discarding</p> <ul style="list-style-type: none"> ▪ Information and steps taken to avoid. ▪ Discard prohibition, information on its success, implementation, compliance and enforcement. <p>Reporting</p> <ul style="list-style-type: none"> ▪ E-logbook reporting of non-target catches, is a requirement and the Trackwell system has the facility but is it being used/policed? <p>Seabirds, Marine Mammals and ETP impact mitigation</p> <ul style="list-style-type: none"> ▪ 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. <p>Habitats</p> <ul style="list-style-type: none"> ▪ 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.

Meeting Date and Location	Personnel	Areas of discussion
		<ul style="list-style-type: none"> ▪ Government policy on protection of VMEs and regulations put in place.
<p>Date: 14/02/2018</p> <p>Time 13:00</p> <p>Location: Reykjavik</p>	<p>Coastguard Björgólfur H. Ingason, Chief controller, Icelandic Coast Guard</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <ul style="list-style-type: none"> ▪ 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.
<p>Date: 14/02/2018</p> <p>Time 15:00</p> <p>Location: Reykjavik</p>	<p>Fisheries Iceland Kristján Þórarinnsson</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <ul style="list-style-type: none"> ▪ 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.
<p>Date: 15/02/2018</p> <p>Time 10:00</p> <p>Location: Grindavík</p>	<p>Vísir hf. Pétur Hafsteinn Pálsson, Manager Erla Ósk Pétursdóttir, HR and Development Manager</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <ul style="list-style-type: none"> ▪ 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.
<p>Date: 15/02/2018</p> <p>Time 13:00</p> <p>Location: Reykjavik</p>	<p>National Association of Small Boat Owners Örn Pálsson, Manager Axel Helgason, Chairman of the Board</p> <p>Assessment Team Members: Sam Dignan, Lead Assessor Conor Donnelly, Assessor Dankert Skagen, MD, Assessor Gísli Svan Einarsson, Assessor</p>	<p>Topics Discussed:</p> <ul style="list-style-type: none"> ▪ 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. ▪ 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 contradictory 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 4 below.

Table 4. 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 5 below.

Table 5. 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	
		1.1.8.3		Yes				x	Full	

Section	Clause (Scoring Element)			Applicable	Low	Medium		High	Conformance level	NC No.		
					Critical	Major	Minor	Full				
1	1.1.9	1.1.8.4		Yes				x	Full			
		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			
		2.2.2		Yes				x	Full			

Section	Clause (Scoring Element)			Applicable	Low	Medium		High	Conformance level	NC No.		
					Critical	Major	Minor	Full				
2.3	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		
	2.3.1	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, the Icelandic Summer Spawning Herring commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls and indirectly by gears from other Icelandic fisheries legally landing herring, 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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>

Summary Evidence:

Iceland has a structured management system that covers all commercial species, including herring. 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 patrols Iceland's 200-mile EEZ 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 plan, approved by ICES. The main management measures include TACs in an ITQ system, spatial closures to protect undersized and spawning fish and mesh size regulations.

Evidence:

Iceland has a structured management system that covers all commercial species, including herring. 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 fishery³.

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 Iceland⁴)* 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 guard⁸ 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 17). 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 <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>

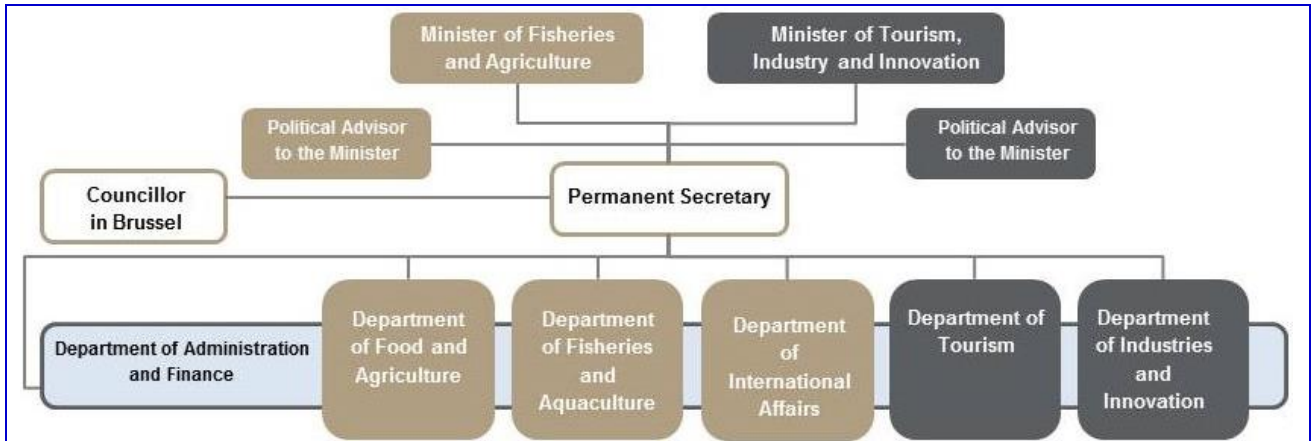


Figure 17. Organisational chart of the Ministry of Industries and Innovation.

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 Keflavik 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.

The Coast Guard’s flagship vessel (Thor) is 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 MRI 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 112-2015⁹) 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 record¹⁰.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
None <input checked="" type="checkbox"/>			
Summary Evidence:			
<p>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 15% of the standing biomass of herring 4 years and older. Discards is prohibited. Herring 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.</p>			
Evidence:			
<p>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.</p>			

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 herring, is output control through a total allowable catch (TAC) that is distributed on the participating vessels by an ITQ system. The overall TAC is set by the Ministry, 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 of Industries and Innovation** 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 recent years when the Ministry has allowed bigger total allowable catches than recommended by the Institute¹². 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 vessel'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 herring, 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-time¹⁴. 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.

ITQs for herring were introduced when the moratorium for herring fishery after the stock collapse was lifted in 1975. In 1979 spokesmen for the industry suggested fairly unrestricted transfers of quotas between vessels, which the Ministry of Fisheries permitted. The *Fisheries Management Act* of 1990 (the forerunner for Law 116/2006) made the vessel quota system in the herring fishery part of the general ITQ system.

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 (but not between herring and other species). 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. It is believed that some discard (or slipping) of small herring may have taken place in periods with large incoming year classes (1990 - 1995 in particular). Surveillance by inspectors from the Directorate of Fisheries during each fishing season is considered adequate in verifying if a discard is ongoing.¹⁵

Table 6 shows the recent historical record of adherence to the quotas, according to the MFRI advice¹⁶. The deviations go in both directions. The largest deviations are 17% below and 13% above. The national TAC has followed the advice

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 Section B1.2, http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2017/her.27.5a_SA.pdf; and discussions at site visit Feb. 2018

16 <https://www.hafogvatn.is/static/extras/images/Sild222.pdf>

most of these years. A major source of deviations seems to be transfer of quotas between years - the averages over the period differ by only 600 tonnes.

Table 6. Recommended TACs, national TACs, and catches (tonnes) of ISS herring in recent years.

Fiskveiðíár <i>Fishing year</i>	Tillaga <i>Rec. TAC</i>	Aflamark <i>National TAC</i>	Afli <i>Catches</i>
2010/11	40000	40000	43533
2011/12	40000	45000	49446
2012/13	67000	68500	71976
2013/14	87000	87000	72058
2014/15	83000	83200	94975
2015/16	71000	71000	69729
2016/17	63000	63000	60403
2017/18	38 712 ¹⁾	39000	35034
2018/19	35 186 ¹⁾		

¹⁾ Refers to years where the current 18% harvest control rule has been applied.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

Summary Evidence:

The main measure is an overall TAC, distributed in an ITQ system. Fishery of juvenile herring (27 cm and smaller) is prohibited and to prevent such a fishery, area closures are enforced. The fishery can only take place from 1st September to 31st May next year with nets, purse seines and mid-water trawls. The mid-water trawling is only allowed outside of 12 nautical miles with some additional area restrictions. Use of sorting grids in the mid-water trawls can be required in some areas, if necessary to avoid bycatch. When gill-nets are used in the herring fishery, the minimum mesh size (stretched) is 63 mm. Discarding is prohibited in Icelandic fisheries.

Evidence:

The main instrument for the conservation and sustainable use of the herring 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 technical regulations, area closures and a discard ban. The fishery for herring is conducted partly with purse seine and partly with trawl (Figure 18).

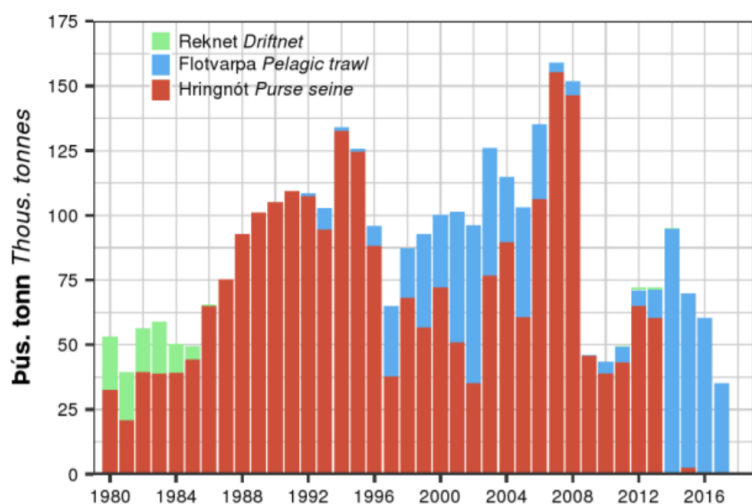


Figure 18. Catches of Iceland summer spawning herring by gear type (1979/1980 – 2017/2018).

In recent years, trawl has dominated because the fishery takes place relatively far from the coast and in deep water. The purse seine dominated when the herring could be caught inshore, where trawling is prohibited. The previous drift-net fishery ended in the mid 1980ies.

The area distribution of the fishery reflects shifts in the distribution of the herring, which can vary considerably from year to year. Presently, the main fishery takes place near the shelf-break to the west. There is also smaller catches at the south coast that are by-catches in fisheries for Norwegian Spring Spawning herring and mackerel.

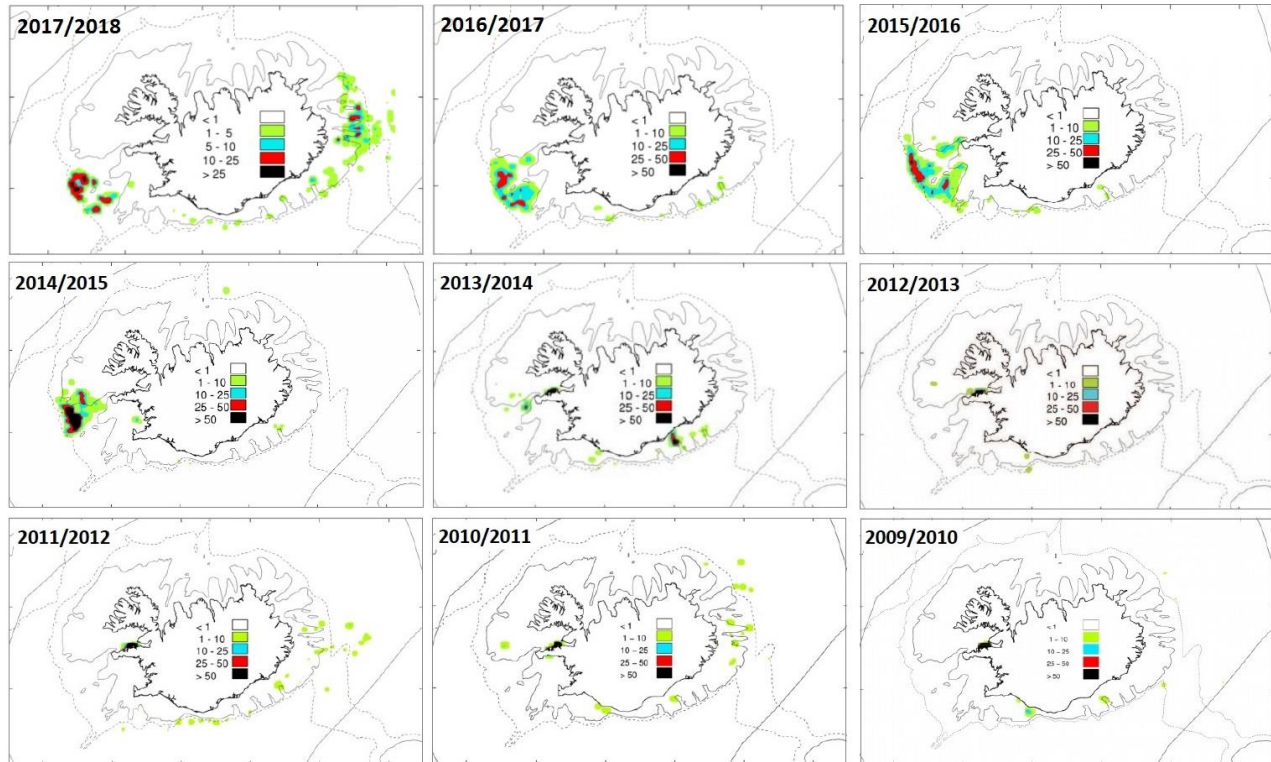


Figure 19. Spatial distribution of summer spawning herring catches (2009/2010 – 2017/2018); Note the very localised but strong concentrations in Breiðafjörður in western Iceland in the period prior to 2014/2015.

Icelandic pelagic fisheries follow a yearly cycle, where the herring fishery mostly takes place in the autumn (Figure 20).

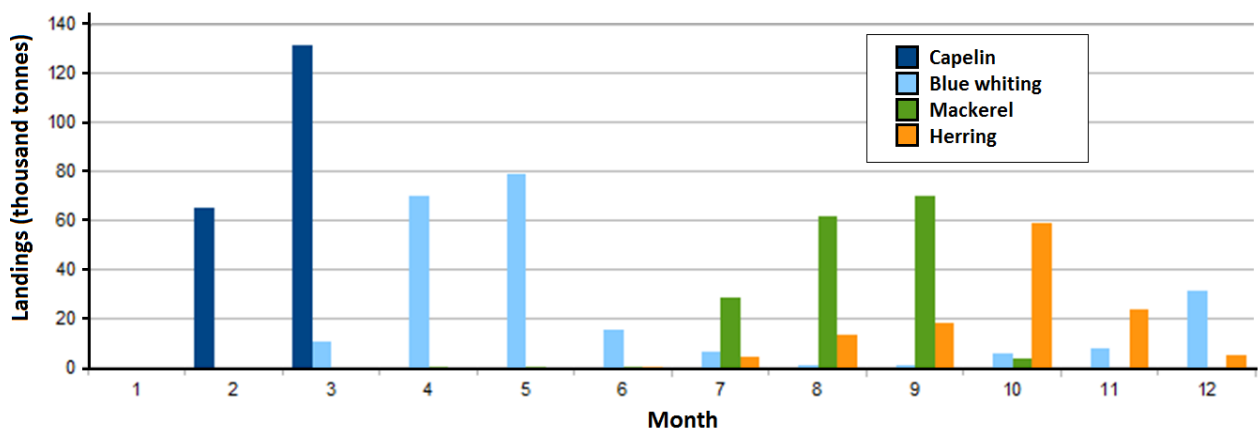


Figure 20. Icelandic catches of pelagic fish by month in 2016; Note herring includes catches from all stocks. Source. Fisheries directorate website.

There is some fishery for Norwegian Spring Spawning herring and by-catch of herring in the mackerel fishery, both in the summer. In 2016/17 the direct herring fishery started in October in offshore areas west of Iceland. Most of the catches were taken over a wide area there in October to December in pelagic trawls, or 89% of the total catch. The remaining of the catch was taken as by-catch in the fishery for the Norwegian spring-spawning herring, NSSH, and Atlantic mackerel during June to September.

Like in some of the previous winters, spring-spawning herring (Icelandic or Norwegian spring spawners) was mixed with the Icelandic summer-spawning herring stock in the catches in the winter 2016/2017. This applied to the fishery in the west as maturity stage of the herring in catch samples in September-December indicated that 4.1% of the herring caught there were spring spawners.¹⁷

The fishery of the summer-spawning herring is currently regulated by regulations set by the Icelandic Ministry of Fisheries in 2006 (no. 770, 8. September 2006)¹⁸. According to this regulation, fishery of juvenile herring (27 cm and smaller) is prohibited and to prevent such a fishery, area closures are enforced. The fishery can only take place from 1st September to 31st May each fishing season (1st September-31st August) in nets, purse seines and mid-water trawls. Mid-water trawling is only allowed outside of the 12 nautical miles zones with some additional area restrictions. Use of sorting grids in the mid-water trawls can be required in some areas, if necessary to avoid by-catch when gill-nets are used in the herring fishery, the minimum mesh size (stretched) is 63 mm.

Discard are prohibited in Icelandic fisheries, as noted in clause 1.1.2. Discards probably occurred when strong year classes entered the stock in the early 1990ies. 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

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Non-Conformance:	None <input checked="" type="checkbox"/>		
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		

17 <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/NWWG/13-NWWG%20Report%202017%20Sec%2011%20Icelandic%20summer%20spawning%20herring.pdf>, Section 11.2

18 <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553>

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

20 <http://www.althingi.is/lagas/148b/1996057.html>

21 <http://www.althingi.is/lagas/148b/1997079.html>

8.1.1.5 Clause 1.1.5.

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

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>The assessment and advice of herring by ICES is documented in the NWWG 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 MRI 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-time on the Directorate website.</p>			
Evidence:			
<p>The herring 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 herring is a harvest rule which was adopted in 2017²² after being evaluated by ICES²³ and found to be in accordance with the precautionary approach. According to this rule, the TAC is set at 15% of the fishable biomass 4 years old and older. This percentage is reduced linearly with SSB towards the origin if SSB is below 200,000 tonnes.</p> <p>Several alternative harvest rules were evaluated by ICES and found to be in accordance with the precautionary approach. The adopted rule has a relatively low harvest rate (15%) and high trigger point (200 000 tonnes) to sustain future episodes of the Ichthyophonus disease.</p> <p>The assessment and advice by ICES is documented in the NWWG 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 assessment²⁴, the ICES advice²⁵ and the MRI advice²⁶ 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 based on their catches in a given stock 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-time on the Directorate website²⁷. Here, both available quotas and recorded landings can be followed for every vessel and for every harbour.</p>			
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

22 <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2017/07/04/Aflaregla-fyrir-islenska-sumargotssild/>

23 http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/iceland.2017.11.pdf

24 <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/NWWG/13-NWWG%20Report%202017%20Sec%2011%20Icelandic%20summer%20spawning%20herring.pdf>

25 <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/her.27.5a.pdf>

26 <https://www.hafogvatn.is/static/extras/images/Sild222.pdf>

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

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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:	See footnotes.		
Non-Conformance Number (if relevant)			NA

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
The management of herring is part of the general fisheries management in Iceland, and rules and regulations that apply in general apply to herring as well. Some elements are specific to herring. Taken together, these elements can be regarded as a fisheries management plan. These elements are in place, documented and publicly available.			
Evidence:			
The management of herring is part of the general fisheries management in Iceland, and rules and regulations that apply in general apply to herring 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			
<ul style="list-style-type: none"> • A legal basis for relevant management measures • Organized distribution of authority and responsibility between institutions. • Support for regular stock assessments, including monitoring of catches, an acoustic 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 herring, particularly technical regulations ²⁹ and the HCR. 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

²⁸ FAO Code of Conduct, art. 7 .3.3.

²⁹ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

Summary Evidence:

The management unit is the Icelandic summer spawning herring stock. It is a unit stock, confined to Icelandic waters and managed by Icelandic authorities. 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 the Icelandic summer spawning herring (ISSH) stock. This is the major herring stock in Icelandic waters, Results from various researches including tagging experiments around the middle of last century, studies on larval transport, and studies on migration pattern and distribution, all suggest that the stock is local to Icelandic waters and is restricted entirely to the Icelandic EEZ.

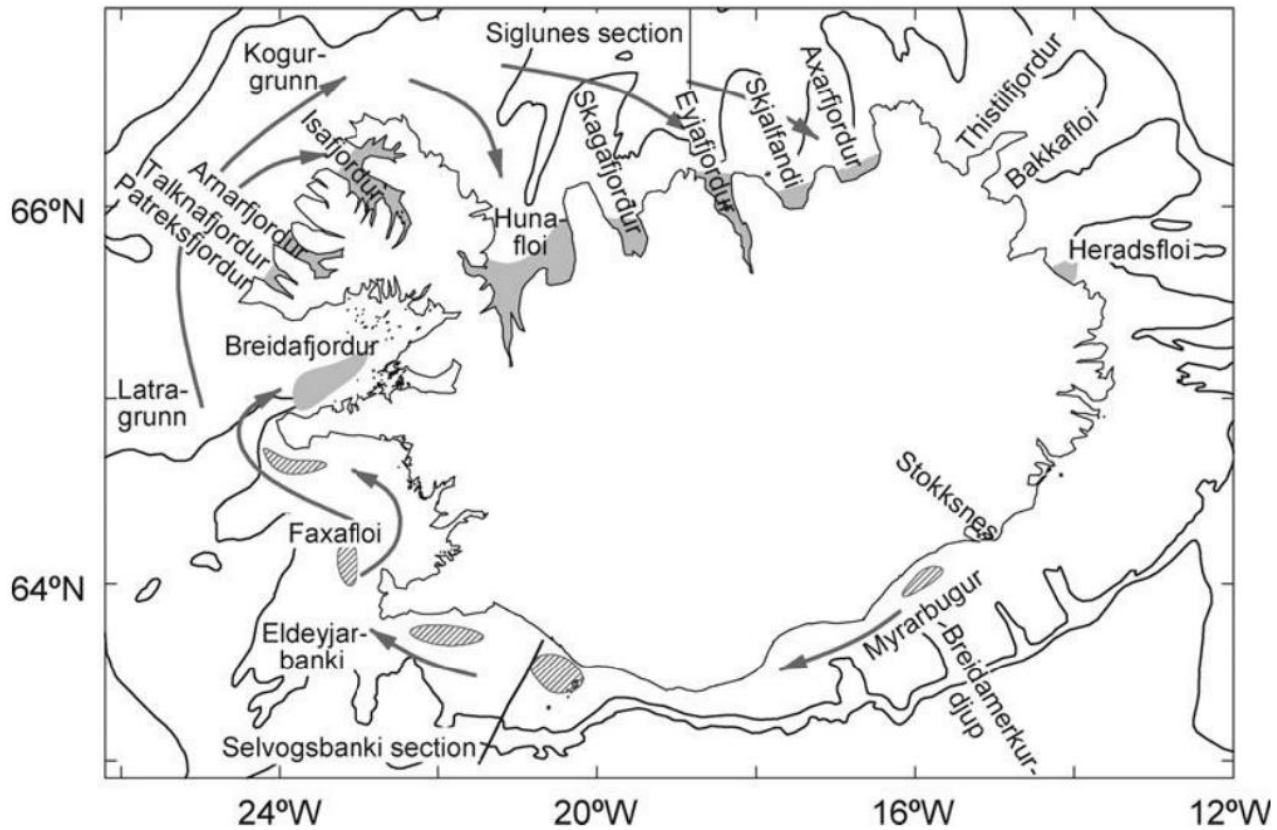


Figure 21. Spawning and nursery areas for Icelandic summer spawning herring. Grey shading indicates the nursery areas, and stripes the spawning areas, and the arrows show the directions of larval drift (adopted from Gudmundsdottir et al. 2007)³⁰.

30 Gudmundsdottir, A., Oskarsson, G. J., and Sveinbjörnsson, S. 2007. Estimating year-class strength of Icelandic summer-spawning herring on the basis of two survey methods. ICES Journal of Marine Science, 64: 1182–1190.

Accordingly, it is managed as a domestic stock by Iceland. In Icelandic waters, Norwegian spring spawning herring also occurs in the summer, and is caught in particular in the South. Catches in that area are controlled for stock identity by examining the gonads. This is done routinely by the skippers and occasionally controlled by inspectors from the Directorate. There are some smaller stocks as well, for example an Icelandic spring spawning stock that may have been related to the Norwegian spring spawning stock but is small at present.

The area distribution of the ISSH stock has varied considerably historically, as noted under clause 1.1.3. The fishery now takes place in feeding areas close to the Western shelf break, while spawning takes place close to the coast in the South-West and nursery areas are in fjords in the North (Figure 21).

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 statement³² 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 harvest rule 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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>

Summary Evidence:
The main instrument for ensuring sustainable exploitation is output control through quotas which are set according to an agreed harvest control rule. The rule has a target value (15%) for the harvest rate (TAC in percent of the adult (4+) biomass), which is a proxy for a target fishing mortality. The harvest rate shall be reduced if the SSB is below 200,000 tonnes, which coincides with the limit biomass reference point. There is no explicit stock biomass target.

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

31 This translation was previously 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.
 32 <http://www.responsiblefisheries.is/seafood-industry/management-and-control-system/statement-on-responsible-fisheries/>
 33 F_{lim} can be explicit, or implicit in cases where harvest rate is set annually to a precautionary F_{lim} (or its proxy)]

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.

A harvest control rule (HCR) for herring was evaluated, approved³⁴ and adopted in 2017³⁵. It has a target value (15%) for the harvest rate (TAC in percent of the adult (4+) 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 200,000 tonnes, below which the harvest rate is reduced linearly towards the origin. If SSB falls below that level, the harvest rate is reduced to $0.15 \cdot \text{SSB} / 200,000$.

A limit reference point B_{lim} for the spawning stock biomass (SSB) is established, also at 200,000 t. Simulations show a low (<5%) risk of bringing the SSB below the limit when harvesting at the target harvest rate (15%). (Figure 22). Although reduction of the harvest rate below that level does not reduce the risk of falling below B_{lim} , it should facilitate recovery if so happens³⁶.

There have been epizootics episodes with the parasite (or fungus) *Ichthyophonus hoferi* which leads to increased mortality. Recent studies by MFRI scientists have clarified the mortality associated with visible signs of disease³⁷. Additional simulations were done to ensure that the HCR would still be precautionary if episodes of disease as seen in the past should occur. This could be achieved by reduction of the harvest rate in periods with disease or by applying a sufficiently low standard harvest rate. The latter option was preferred, leading to a harvest rate that is somewhat below the rate that would lead to maximum long-term yield.

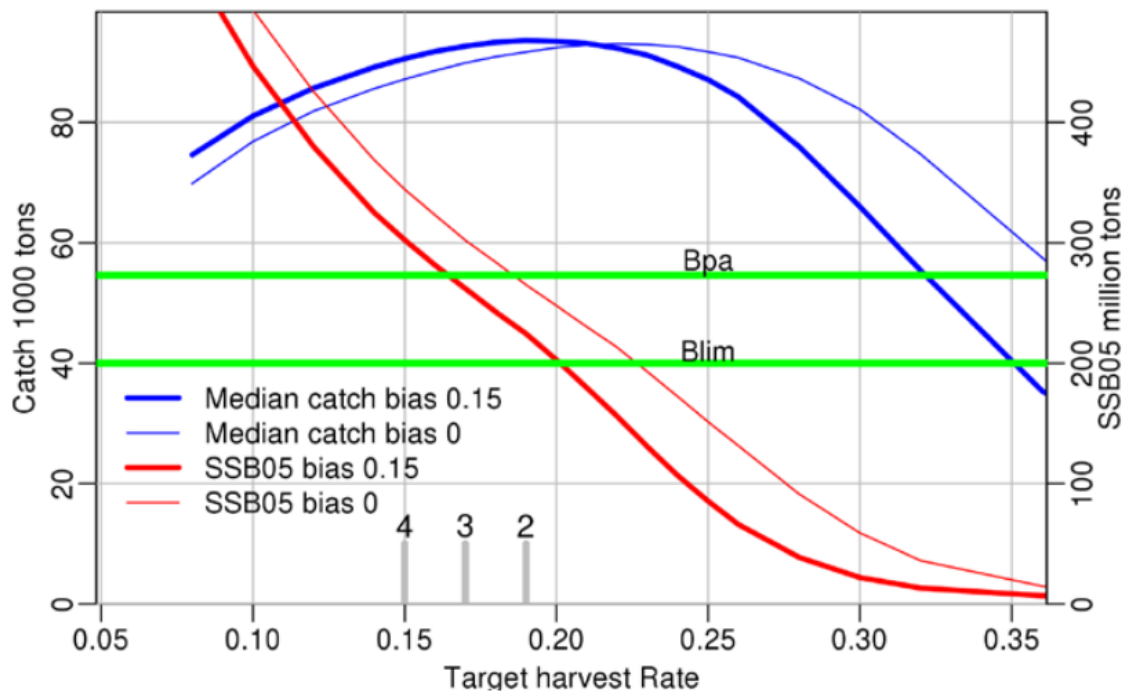


Figure 22. Median catch and fifth percentile of SSB at equilibrium (long term) for different harvest rates, with and without assuming 15% assessment bias. No increase in natural mortality from *Ichthyophonus* epidemics. Harvest rates corresponding to HCRs 2, 3, and 4/5 (0.19, 0.17, and 0.15, respectively) are shown. HR = 0.19 maximizes the median catch when a 15% assessment bias is assumed. No $B_{trigger}$ was applied.

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

34 http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/iceland.2017.11.pdf
 35 <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2017/07/04/Aflaregla-fyrir-islenska-sumargotsild/>
 36 http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/Special_requests/iceland.2017.11.pdf
 37 Guðmundur J. Óskarsson, Jónbjörn Pálsson and Asta Guðmundsdóttir. An ichthyophoniasis epizootic in Atlantic herring in marine waters around Iceland. Canadian Journal of Fisheries and Aquatic Sciences. In press 2018.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>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, and rules specific for the herring. 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 an acoustic survey of the stock.</p>			
Evidence:			
<p>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 summer spawning herring is entirely by Iceland, as this a domestic stock, confined to Icelandic waters.</p> <p>The assessment is supported by a well-organised system for collection of fisheries data, as well as by an acoustic survey of the stock, as described in detail in clauses 1.2. The assessment work is done in ICES by the North-Western Working Group. 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 acoustic 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 are 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, managers 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. At site visits and elsewhere, we are given the impression of a quite general consensus that following the scientific advice and applying the precautionary approach is preferable in the long term.</p> <p>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</p> <p>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 fisheries³⁸ 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)³⁹.</p>			
References:	See Footnotes.		
Non-Conformance Number (if relevant)	NA		

38 <http://www.althingi.is/lagas/148b/1996057.html>

39 <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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>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.</p>			
Evidence:			
<p>The Marine and Freshwater Research Institute (MFRI)⁴⁰ 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 science⁴¹ 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.</p> <p>The main research priorities are</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>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.</p> <p>MFRI has wide international cooperation in all major fields of marine science, as indicated by its publication record⁴².</p> <p>MFRI participates in providing annual stock assessment and international advice by ICES, which for the herring is done by the ICES North-Western Working Group. MFRI issues advice on individual stocks on the web once it is ready⁴³. 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 website⁴⁴.</p>			
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

40 www.hafro.is, www.hafogvatn.is/en

41 <http://www.althingi.is/lagas/148a/2015112.html>

42 http://www.hafro.is/undir_eng.php?ID=20&REF=3

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

44 <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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>The ISS herring stock is assessed by ICES using data provided by MFRI. The main data are catch statistics, life history data from the fisheries, and stock abundance measurement by an acoustic survey in the winter. All catches of herring must be landed in authorized ports and weighed by authorized weighers. Landings are reported to the Directorate, are the primary source of catch data and are assumed to equal catches as discarding is prohibited and likely minimal. 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 with the information being 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, as well as occurrence of disease. The other source of information in the assessment is results of an acoustic research survey, which has been ongoing annually with a few exceptions.</p>			
Evidence:			
<p>The ISS herring stock is assessed by ICES (North-Western Working Group - NWWG)⁴⁵ using data provided by MFRI. The main data are catch statistics, life history data from the fisheries, and stock abundance measurement by an acoustic survey in the winter.</p>			
Fisheries data			
<p>The location of the fishery can vary considerable from year to year and in recent years the fishery has mostly taken place to the west of Iceland with some smaller catches being taken off the South-east coast (see Figure 19 in supporting evidence for Clause 1.1.3).</p>			
<p>Most ISS herring catches are clean, coming from the directed ISS herring fishery and comprising only ISS herring, but there may be some bycatch of ISS herring in the mackerel fishery and the Norwegian spring spawning (Atlanto-Scandian) herring fishery in the summer in the south. If by-catch of herring from other stocks is an issue, skippers are obliged to establish the stock identity and report by stock. Inspectors from the Directorate control selected samples. The criterion is the development of the gonads, which is different between summer spawners and spring spawners.</p>			
<p>All catches of herring must be landed in authorized ports and weighed by authorized weighers⁴⁶. 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 (see below). Log-books are compulsory and provide supplementary information but are not used directly for catch statistics.</p>			
<p>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. For herring, at least the fish length, weight, age (from scales), sex, maturation, and weight of sexual organs 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.</p>			
<p>The other source of information in the assessment is an acoustic research survey, which has been ongoing annually since 1974 except for the winters 1976/77, 1982/83, 1986/87, and 1994/95. Normally these surveys are conducted in the period of October-January, but also as late as end of March. To account for the variable area distribution of the stock (see Figure 19 in supporting evidence for Clause 1.1.3), the surveyed area each year is decided on basis of available information on the distribution of the stock in previous and the current year, which include information from the fishery. Thus, the survey area varies spatially as the survey is focused on the adult and incoming year classes but is considered to cover the whole stock each year. Recent examples are shown in Figure 23.</p>			

45 <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2016/NWWG/13%20NWWG%20Report%20-%20Sec%2011%20Icelandic%20summer%20spawing%20herring.pdf>

46 <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/3842>

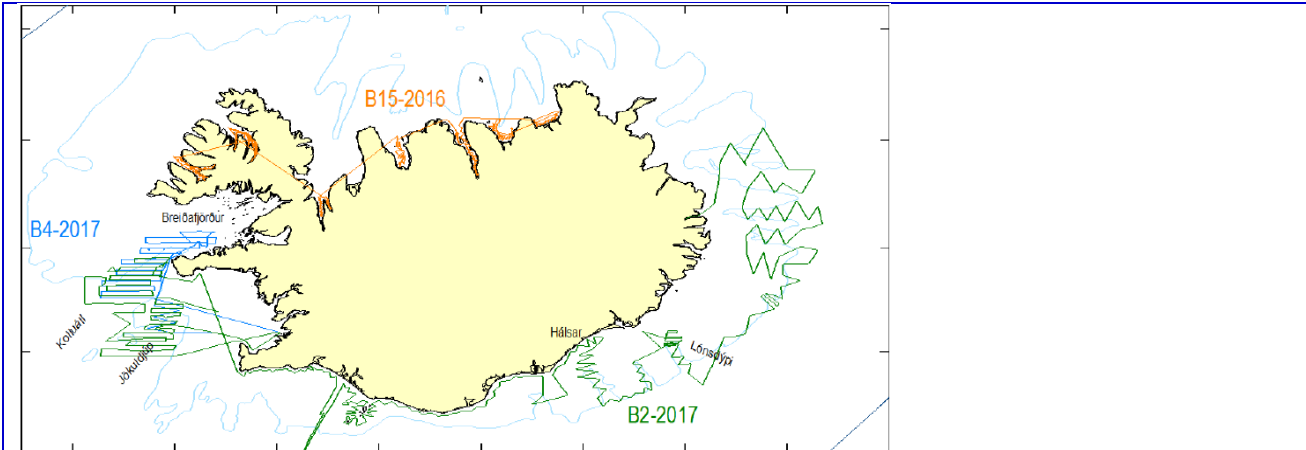


Figure 23. Survey tracks of acoustic survey coverages on ISS herring in Sept.-Oct. 2016 (B15-2016 on juveniles; orange line), February 2017 (B2-2017 on adults; green line), and March 2017 (B4-2017 on adults; blue line).

Measurements of weight, age and length in samples taken from trawl hauls on registrations during the survey are used both to convert acoustic registrations to numbers and biomass and to provide the age and length distribution of the survey biomass.

The assessment is done with the assessment tool NFT-ADAPT (VPA/ADPAT version 3.3.0 NOAA Fisheries Toolbox) which has been used for the assessments of ISS herring since 2005. Applying it was evaluated at benchmark assessment in January 2011⁴⁷ and found to be appropriate as the principal assessment tool for the stock. This method uses age disaggregated catch and survey data, as well as data on weights and maturity. Hence, the data available for herring are adequate and sufficient for this method.

The assessment can have some inconsistencies from year to year, as indicated in the retrospective plot (Figure 24). Such retrospective uncertainty was considered when the harvest rule was approved. In the 2017 assessment, new estimates of natural mortality were applied, leading to lower estimates of SSB in the years 2003 – 2011. The revision did not trigger revision of the reference points.

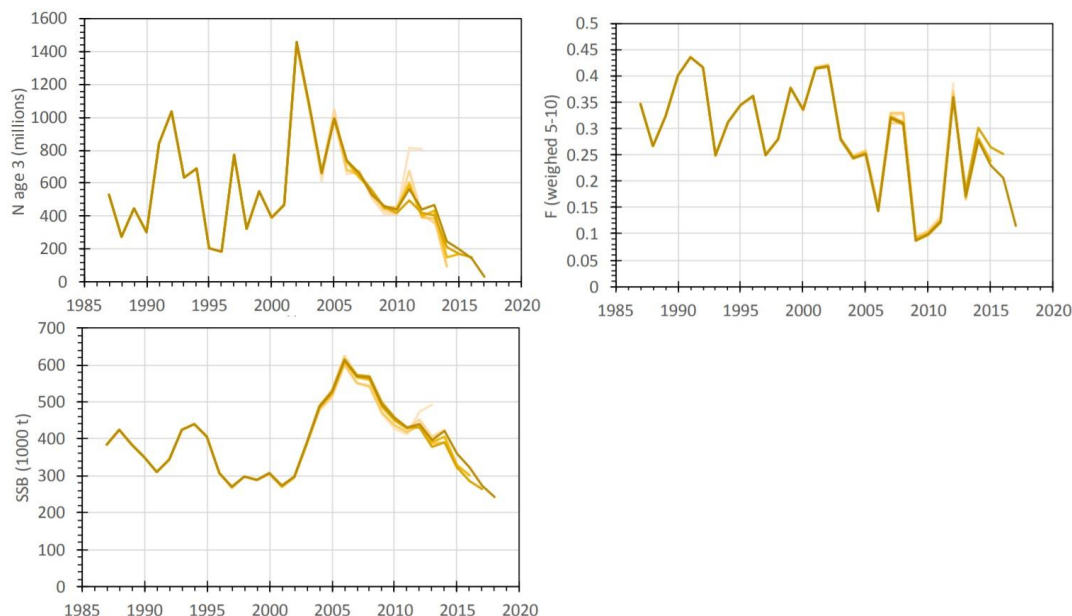


Figure 24. Retrospective pattern from NFT-Adapt in 2018 in spawning stock biomass, N weighted F_{5-10} and recruitment as number at age 3, according to the 2018 assessment.

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

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

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>Estimates of stock size and productivity of the stock is obtained through annual stock assessments. The stock assessment for herring is based on landings data and results of an acoustic survey, as well as life history data. With the current harvest rate, the expected yield is near the maximum and the stock biomass safely above the limit.</p>			
Evidence:			
<p>The stock assessment is based on catch data, an acoustic survey and natural mortality that is partly estimated, partly assumed. The assessment reflects the stock abundance needed to cover the reported catches when natural mortality is considered, 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.</p> <p>There is no clear dependence of recruitment on stock abundance within the range that can be expected with a moderate fishing mortality. Accordingly, the yield and biomass per recruit is a fair measure of the productivity at such mortality levels. The yield per recruit curve (Figure 25) is relatively flat topped with a maximum around a harvest rate of 0.20 - 0.25. The selected harvest rate of 0.15 is on the low side of the maximum, which implies a slight loss of median catch but a larger SSB, which reduces the risk of SSB approaching the limit.</p>			
<p>The figure is a line graph with two y-axes and one x-axis. The x-axis is 'Target harvest Rate' ranging from 0.05 to 0.35. The left y-axis is 'Catch 1000 tons' ranging from 0 to 80. The right y-axis is 'SSB05 million tons' ranging from 0 to 400. There are four curves: a blue curve for 'Median catch bias 0.15', a light blue curve for 'Median catch bias 0', a red curve for 'SSB05 bias 0.15', and a light red curve for 'SSB05 bias 0'. Two horizontal green lines represent 'Bpa' at approximately 55 million tons and 'Blim' at approximately 40 million tons. Three vertical grey bars are labeled '4', '3', and '2' at harvest rates of approximately 0.15, 0.20, and 0.25 respectively.</p>			
<p>Figure 25. Median catch and fifth percentile of SSB at equilibrium (long term) for different harvest rates, with and without assuming 15% assessment bias.</p>			
<p>Weight at age may vary, but there does not seem to be clear density dependence effects (Figure 26). Hence, the agreed harvest rule should lead to a near maximum long-term yield with a high SSB.</p>			
<p>The figure contains two scatter plots. The left plot shows 'Mean weight at age 4' on the y-axis (0.18 to 0.26) versus 'Number at age 4' on the x-axis (200 to 1400). The right plot shows 'Mean weight at age 6' on the y-axis (0.26 to 0.32) versus 'Stock biomass' on the x-axis (100 to 700). Both plots include blue data points and a red trend line showing a slight negative correlation.</p>			
<p>Figure 26. Relationship between mean weight-at-age 4 against number-at-age 4 (left) and mean weight-at-age 6 against SSB.</p>			
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>

Summary Evidence:

Discards are considered to be insignificant in the fishery of Icelandic summer-spawning herring, with a few exceptions (1990-95) related to large year classes entering the fishery. In fisheries for Norwegian spring spawning herring and for mackerel in the South, some ISS herring is caught as by-catch. In these fisheries, the occurrence of ISS herring is estimated by inspection of the gonads, and the herring catches are reported by stock. Estimates of increased mortality due to the disease by *Ichthyophonus hoferi* is included in the stock assessment. 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 and partly estimated natural mortality.

With the applied method, fishing mortality is calculated directly from the catches at age, an assumed natural mortality, and a number of survivors the last year in accordance with the survey results.

Discards are illegal in Icelandic waters. Normally, discards are considered to be insignificant in the fishery of Icelandic summer-spawning herring. There are few exceptions in the past 35 years where discards were estimated to be significant (1990 – 1995). These exceptions are related to large year classes entering the fishery where juveniles were numerous in the catch. Surveillance by inspectors from the Directorate of Fisheries during each fishing season is considered adequate in verifying if a discard is ongoing⁴⁸.

In some pelagic fisheries, notably for Norwegian spring spawning herring and for mackerel in the South, some ISS herring is caught as by-catch mixed with other herring. In these fisheries, the fishermen are obliged to sort and report by stock. The method for separation is through inspection of the gonads. The results are checked occasionally by inspectors from the Directorate, without finding discrepancies that are cause of concern.

An additional source of mortality which is taken into account is outbreaks of *Ichthyophonus hoferi* disease. This organism is now regarded as a protozoa of the class Mesomycetozoa, previously it used to be classified as a fungus. Outbreaks last a few years and mostly hit the younger ages, with necrotic pustules in muscular tissue and in particular in the heart. Infection occurs by oral intake of *Ichthyophonus* spores but is not clear how they are transmitted. The disease occurs in many fish species and causes disease of varying severity.

Ichthyophonus is not dangerous to warm blooded species like humans, but the quality of the herring may be reduced. Previously, it was assumed that all diseased herring would die from the disease. Now, scientists at MFRI have clarified that only about 1/3 of fish with visible signs of infection will die⁴⁹. The natural mortality associated with the observed prevalence of disease manifestations (lesions and granulomas) is now estimated in the order of 0.2 - 0.3 in disease periods, while the standard assumed natural mortality is 0.1 (Table 7). The recent harvest control rule was designed to tolerate periods with such additional mortality.

48 Communicated at site visit at MFRI 13/2-2018. See also: http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2017/her.27.5a_SA.pdf

49 Guðmundur J. Óskarsson, Jónbjörn Pálsson and Asta Guðmundsdóttir. An ichthyophoniasis epizootic in Atlantic herring in marine waters around Iceland. Canadian Journal of Fisheries and Aquatic Sciences, in press 2018

Table 7. The applied M in analytical assessment for Icelandic summer-spawning herring in the winter 1987-2017, which represent the fixed value (0.1 plus additional M caused by Ichthyophonus infection in 2008/09 to 2010/11 and 2016/2017 (years referring to the autumns) for age groups 3 to 13+. From the 2017 NWWG report⁵⁰.

Year\age	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
1987-2008	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
2009*	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
2010*	0.29	0.29	0.28	0.26	0.25	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
2011*	0.13	0.26	0.26	0.25	0.23	0.24	0.25	0.24	0.20	0.21	0.21	0.21	0.21	0.21
2012-2016	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
2017**	0.11	0.12	0.13	0.17	0.18	0.21	0.19	0.26	0.29	0.21	0.18	0.19	0.10	0.10

Two incidents of mass mortalities in the herring stock have been observed in the past, believed to be caused by too low levels of oxygen⁵¹. The amounts of herring estimated to be lost was taken into account in the assessment by adding them to the catch data.

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.

More detailed evidence regarding surveillance and enforcement can be found in Section 2.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
There is close communication between scientists and the fishing industry, both in formal meetings and through informal contact.				
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:	See footnotes.			
Non-Conformance Number (if relevant)	NA			

50 <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/NWWG/13-NWWG%20Report%202017%20Sec%2011%20Icelandic%20summer%20spawning%20herring.pdf>

51 Gudmundur J. Oskarsson, Solveig R. Olafsdottir, Þorsteinn Sigurdsson, Hedinn Valdimarsson. Observation and quantification of two incidents of mass fish kill of Icelandic summer spawning herring (*Clupea harengus*) in the winter 2012/2013. Fisheries Oceanography. 2018;1–10.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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			
<ul style="list-style-type: none"> • Routine stock assessments and management advice for many commercial stocks, including herring. • 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. ⁵²			
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) ⁵³ .			
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Not Applicable. Icelandic summer spawning herring is confined to Icelandic waters and thus is not regarded as a shared, straddling or highly migratory stock.			
Evidence:			
Not Applicable. Icelandic summer spawning herring is confined to Icelandic waters and thus is not regarded as a shared, straddling or highly migratory stock.			
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

⁵² http://www.hafro.is/undir_eng.php?ID=20&REF=3 (not updated since 2015)

⁵³ <http://www.fiskistofa.is/english/international-cooperation/>

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 approach⁵⁴ shall be implemented to protect the stock under consideration.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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 summer spawning herring 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 overfishing⁵⁵.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: A limit spawning stock biomass has been defined at 200,000 t, above which there is no indication of reduced recruitment historically. Even when some assessment bias is assumed (as has been seen in the past), the upper 5%ile for SSB with the adopted target harvest rate = 0.15 is about 300,000 t. However, there has been a falling trend in recruitment for 10+ years despite a large SSB and modest exploitation, and if that continues, future risks may become higher than estimated now. The present management plan does not have an explicit revision clause.			
Evidence: A limit spawning stock biomass has been defined at 200,000 t, above which there is no indication of reduced recruitment. It was originally based on stock-recruit data going back to 1947 (see Clause 1.3.2.2.3. for further details) but has been revisited without changing it on several occasions, the latest in 2016. The current assessment goes back to 1987 (Figure 27). Recruitment has fluctuated in this period but has declined since 2002 for reasons that are not well understood. The SSB has declined accordingly, but with a lag of 2 – 3 years, despite a low fishing mortality, and is now well below the B _{pa} value. There is no clear evidence that the declining recruitment is caused by low SSB. The reduction in SSB is partly due to the Ichthyophonous outbreak in the stock in 2009 – 2011 and partly to small year classes.			
Figure 27. Recent history of recruitment (age 3) (left) and biomass (right) (Source: MFRI 2018).			
The HCR is designed to carry a low risk (<5%) of bringing the stock down to the limit. Even when assessment bias is assumed, the upper 5%ile for SSB with the adopted target harvest rate = 0.15 is about 300,000 mt.			

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

55 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.

In the evaluation of the harvest rule⁵⁶, the stock-recruit function was estimated from the long-term history as a hockey stick function with log-normal variation and autocorrelation included (Figure 28). The risks were evaluated assuming that the recruitment behaves as in the past. The recent recruitments have declined over a long period and are now lower than indicated by the model. In the calculations, the assumption was that this trend would be broken in 2018 (Figure 29). The estimate of the last recruitment is higher, but the estimate of the most recent recruitment is often uncertain. If the recruitment and stock continue to decline, the risks for the future may be larger than estimated. At present, the management plan does not have an explicit revision clause.

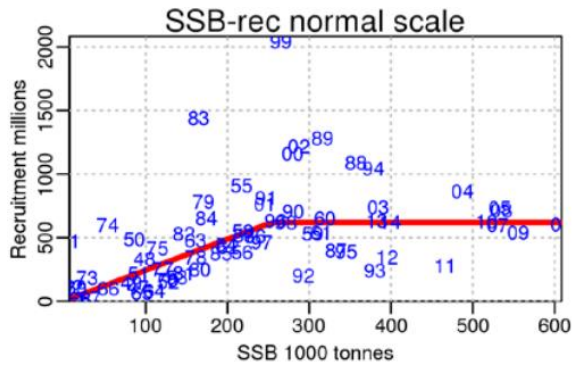


Figure 28. The hockey stick stock recruit function and the history of stock recruit data.

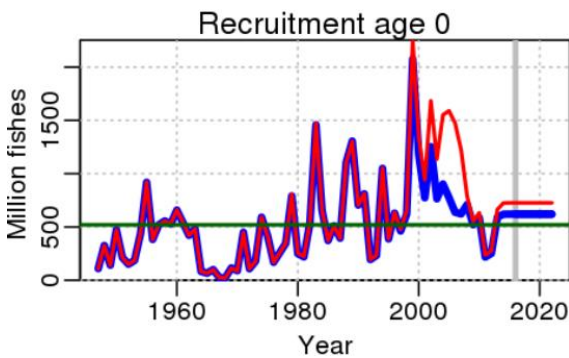


Figure 29. Historic and mean predicted recruitment in harvest rule simulations. The colours represent two different models for the natural mortality under Ichthyophonous outbreak in 2009-11. The blue alternative was used, the red was to demonstrate an alternative formulation that was discarded. From HCR evaluation report⁵⁷.

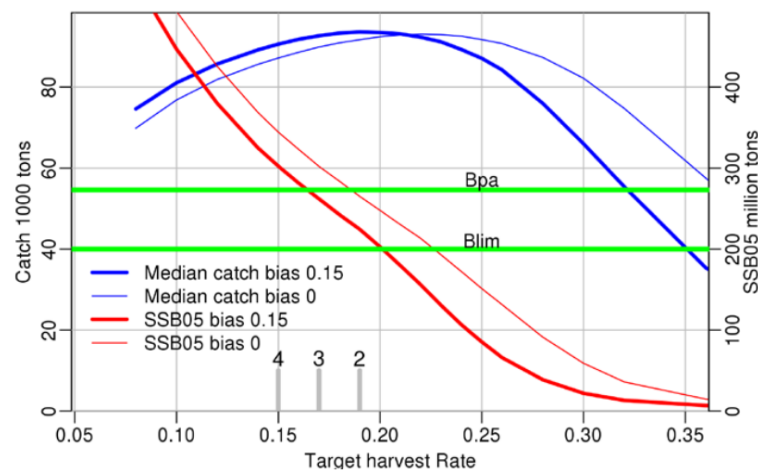


Figure 30. Median catch and fifth percentile of SSB at equilibrium (long term) for different harvest rates, with and without assuming 15% assessment bias. No increase in natural mortality from Ichthyophonous epidemics.

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

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

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

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence: The risk to unwanted stock development is quantified by stochastic simulations of the harvest rule.				
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.				
References: See footnotes.				
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 specified⁵⁸.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence: Precautionary reference points have been defined by ICES. That includes a B_{lim} at 200,000 tonnes and a B_{pa} at 273,000 tonnes, while the upper 5%ile in simulations is about 300,000 tonnes. There is a limit fishing mortality at 0.61 and an F_{pa} at 0.45 while the adopted harvest rate corresponds to F around 0.18. If SSB falls below the limit, the harvest rule prescribes a reduction in the harvest rate.				
Evidence: The reference points tabulated below have been defined by ICES and are adopted in Icelandic advice.				
Table 8. Summer-spawning herring (<i>Clupea harengus</i>) in ICES Division 5.a, (Iceland grounds). Reference points, values, and their technical basis. All weights are in tonnes ⁵⁹ .				
Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	273000	B_{pa}	ICES (2016a, 2017a)
	F_{MSY}	0.22	HCS model for simulated harvest rules	ICES (2016a, 2017a)
Precautionary approach	B_{lim}	200000	SSB with a high probability of impaired recruitment	ICES (2016a)
	B_{pa}	273000	$B_{pa} = B_{lim} \times e^{1.645\sigma}$, where $\sigma = 0.19$	ICES (2016a)
	F_{lim}	0.61	The F that leads to $SSB = B_{lim}$, given mean recruitment	ICES (2016a)
	F_{pa}	0.45	$F_{pa} = F_{lim} \times \exp(-1.645 \times \sigma)$, where $\sigma = 0.18$	ICES (2016a)
Management plan	MGT $B_{trigger}$	200000	Stochastic simulations	ICES (2017a)
	HR _{MGT}	0.15	Management plan, independent of <i>Ichthyophonus</i> infection in the assessment year	ICES (2017a)
The management plan has a harvest rate of 0.15 for age 4+, which corresponds approximately to a fishing mortality of 0.18. This is well below the FMSY and F_{pa} values. This lower target harvest rate is preferred to make further adaptations unnecessary if new episodes of <i>Ichthyophonus</i> disease should occur. According to the rule, the harvest rate will be reduced if SSB falls below the limit of 200 000 tonnes.				
If the situation should get out of control, for example recruitment failure despite a large stock or altered productivity caused by climatic changes, there is no explicit revision clause stated but managers have the legal authority to initiate revisions of the plan and take other action as necessary.				
References: See footnotes.				
Non-Conformance Number (if relevant)			NA	

⁵⁸ FAO Code of Conduct for Responsible Fisheries, Article 7.5.2.

⁵⁹ <http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/her.27.5a.pdf>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
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 MS 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 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 ⁶⁰ , as implemented in the formulation and adoption of the current harvest rule also for herring.				
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
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 at a biomass above which there has been no indications of reduced recruitment in the past. Accordingly, recruitment failure due to low stock biomass should not occur unless the productivity of the stock changes in an unexpected way.				
References:	See footnotes.			
Non-Conformance Number (if relevant)	NA			

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 Plan⁶¹.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence: The management target for the fishing mortality is a harvest rate at 0.15, which is a proxy for a target fishing mortality. No other remedial action than applying it again next year is stated in the harvest rule. ICES has defined a limit fishing mortality (0.61) which is more than 3 times the target.				

⁶⁰ <https://www.responsiblefisheries.is/seafood-industry/management-and-control-system/statement-on-responsible-fisheries/>

⁶¹ Flim can be explicit or implicit in cases where harvest rate is set annually to a precautionary Ftarget (or its proxy)

Evidence:	
<p>The management target for the fishing mortality is a harvest rate at 0.15, which is a proxy for a target fishing mortality. This corresponds to a fishing mortality of approximately 0.18. There is no explicit limit point for the harvest rate in the plan, but ICES has defined a limit fishing mortality (0.61) which is more than 3 times the target. No other remedial action than applying the standard harvest rate again next year if the limit should be exceeded is stated in the harvest rule.</p> <p>The quotas are generally adhered to (cfr. Clause 1.5.8), although there have been some exceptions in the past in both directions. There is so far no experience after the present harvest rule was adopted.</p> <p>The ITQ system has some quota flexibility. Quotas can be transferred between years and in some cases (but not for herring) between species. Most of the deviations from the set TAC can be attributed to transfer between years.</p>	
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 point⁶².

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
<p>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.</p>				
Evidence:				
<p>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 herring management. The government has the authority to do so.</p>				
References:	See footnotes.			
Non-Conformance Number (if relevant)	NA			

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
<p>Not Applicable. A long-term target for the stock size is considered redundant and not defined.</p>				
Evidence:				
<p>Not Applicable. 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 that is 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.</p>				
References:	See footnotes.			
Non-Conformance Number (if relevant)	NA			

62 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.

8.1.3.2.2.2 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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: A precautionary limit biomass has been defined as SSB = 200,000 tonnes, above which there is no indications of impaired recruitment.			
Evidence: A precautionary limit biomass has been defined as SSB = 200,000 tonnes, above which there is no indications of impaired recruitment. Simulations demonstrate a very low risk of reaching the SSB limit with the target harvest rate, even in the case of a new outbreak of Ichthyophonus disease. The biomass limit is discussed in more detail under clauses 1.3.1.2 and 1.3.2.2.3 .			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: The biomass limit reference point was proposed by ICES in 1998 based on an assessment of the history back to 1947. The limit point was the SSB at which the fraction of year classes being above the median rose quite sharply.			
Evidence: The biomass limit reference point was proposed by the ICES Study Group of the Precautionary approach in 1998 ⁶³ . The justification was stated as: 'It appears that the fraction of year classes being above the median rises quite sharply as SSB passes 200,000 tonnes, which makes this a candidate for B_{lim} '. The $B_{lim} = 200,000$ t value has been revisited on several occasions, but as to date evidence has not supported a change. Once the SSB reached 200,000 t in the recovery after the stock collapse, it has mostly remained above that level and the recruitment has been normalized (Figure 31; Figure 32). The SSB has been well above the limit in the period covered by the current assessment (1987 - present).			
Figure 31. Long term history of stock abundance, recruitment, mortality and landings, as estimated in 1997 ⁶⁴ .			

63 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acfm/1998/1998_ACFM10.pdf

64 [http://ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20\(CRR\)/crr223/CRR223-1.pdf](http://ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/crr223/CRR223-1.pdf)

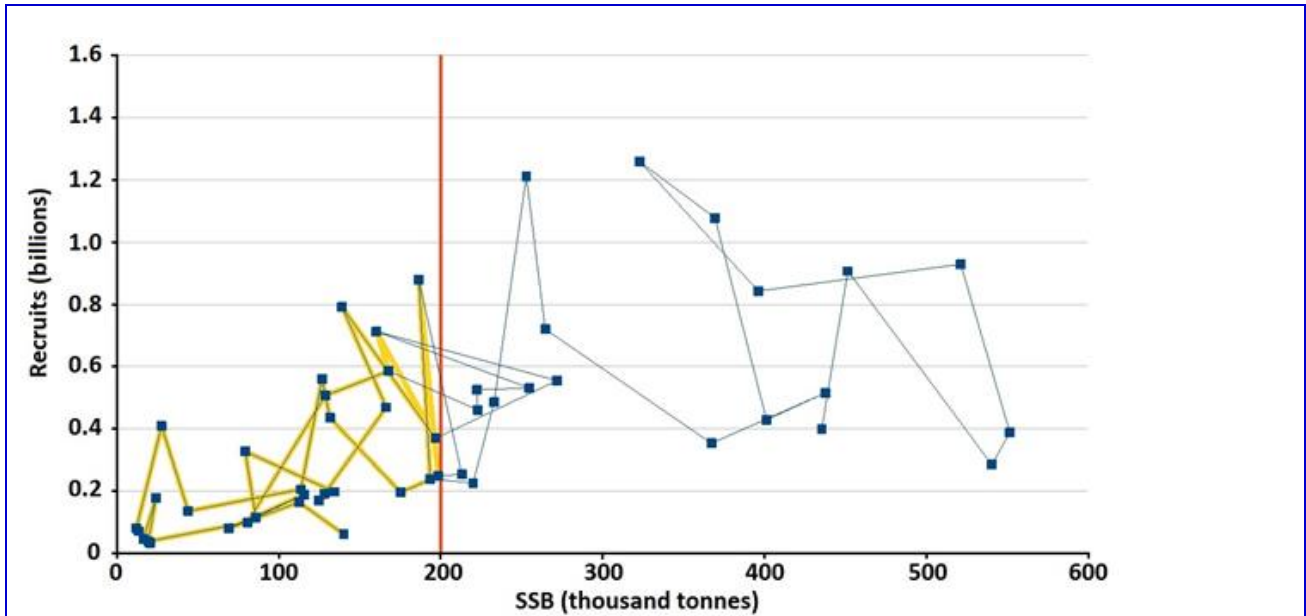


Figure 32. Stock-recruit plot for the ISS herring stock according to the 1998 assessment. Points with estimated SSB below 200,000 t connected with yellow lines.

References:	See footnotes.
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
None <input checked="" type="checkbox"/>			
Summary Evidence: There is no specific management action specified for a situation where SSB approaches the limit. The harvest rule prescribes a reduced harvest rate if SSB is below the limit.			
Evidence: There is no specific management action specified for a situation where SSB approaches the limit. The harvest rule prescribes a reduced harvest rate if SSB is below the limit. 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:	See footnotes.		
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 fishing⁶⁵.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
The harvest rule was designed to provide a near maximum long-term yield and a stock abundance safely away from the limits. In the evaluation, both growth and natural mortality were taken into account. Keeping the harvest rate on the low side of the plateau associated with maximum yield provides a buffer biomass against natural variations in productivity and ensures near maximum yield with a minimum fishing pressure.			
Evidence:			
The harvest rule was designed to provide a near maximum long-term yield and a stock abundance safely away from the limit. In the evaluation, both growth and natural mortality were taken into account. Keeping the harvest rate on the low side of the plateau associated with maximum yield provides a buffer biomass against natural variations in productivity and ensures near maximum yield with a minimum fishing pressure. It 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})⁶⁶.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
The fishery is closed from May to August, which is the spawning season. Nursery areas are in the bottom of fjords where the fleet does not operate, and there is a minimum landing size to protect juveniles.			
Evidence:			
Spawning grounds are mostly close to the coast in in the South and West (see Figure 21 under Clause 1.1.8 for details). The offspring drifts to nursery areas mostly in the fjords in the North and West. Spawning grounds, as well as wintering areas have changed over the years, in analogy with other herring stocks. In particular, wintering area, which is now in the Faxaflói in the West, has in periods been on the South-East coast One hypothesis is that this shift represented resuming previous migration patterns after the recovery from the collapse around 1970.			
The fishery of the ISS herring is limited to the period 1 st September to 1 st May each season, in accordance with regulations set by the Icelandic Fishery Ministry (no. 770, 8 th September 2006) ⁶⁷ . The majority of directed fishing for ISS herring takes place in September and October ⁶⁸ . Since spawning, nursery and wintering areas are quite separate, and the fishery in in the wintering areas, the exploitation of spawning and juvenile fish is a minor problem. Multiple spawning components does not seem to have been an issue for ISSH, contrary to some other herring stocks, e.g. North Sea herring.			

⁶⁵ 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.

⁶⁶ FAO Guidelines (2009), par. 30.3.

⁶⁷ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553>

⁶⁸ Communicated in meeting with HB Grandi, 1/12-2016

In recent years, most of the fishery is in the Western areas (See Figure 19 in Clause 1.1.3). In this area, catches are pure summer spawners; in the East there is mixing with Norwegian Spring Spawning herring, which is separated by examining maturity stages in samples.	
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: The fishery for herring is directed towards adults (>27 cm). Areas where the proportion of juveniles (27 cm and smaller) exceeds 25% by number may be closed. The fishery can only take place from 1 st September to 31 st May each fishing season to avoid fishery on spawning herring.			
Evidence: The fishery for herring is directed towards adults (>27 cm). There are several regulations enforced by the Ministry that effect the ISS herring fishery ⁶⁹ including the closures of areas where the proportion of juveniles (27 cm and smaller) exceeds 25% by number) to protect juveniles herring (no such closures took place in 2015/2016), a regulation prescribing the permitted quantity of bycatch and a regulation to prohibit the use of pelagic trawls within the 12 nm fishing zone which is enforced to limit bycatch of juveniles of other fish species. Use of sorting grids in the mid-water trawls can be required in some areas, if necessary to avoid bycatch. If gill-nets are used in the herring fishery, the minimum mesh size (stretched) is 63 mm. The fishery can take place from 1 st September to 31 st May each fishing season (1 st September to 31 st August) in nets, purse seines and mid-water trawls.			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: ICES is considered to be the appropriate international scientific body. Annual stock assessments are performed by the ICES North-Western Working Group and reviewed routinely as part of the ICES advisory process. ICES also perform in-depth review of assessment methods (benchmarks). For herring the last benchmark was in 2011.			
Evidence: ICES ⁷⁰ is considered to be the appropriate international scientific body. The annual stock assessments and short-term predictions are performed by the ICES North-Western Working Group 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			

⁶⁹ <https://www.reglugerd.is/reglugerdir/33/33b/nr/7553>

⁷⁰ <http://www.ices.dk>

assessment practices. Iceland herring was benchmarked in 2011 ⁷¹ where the assessment procedure that have been practised in recent years (NFT-ADAPT: VPA/ADPAT version 3.0.3 NOAA Fisheries Toolbox) was endorsed.	
There is no formal revision clause in the herring 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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence: Several alternative harvest rules were evaluated by ICES in 2017 and found to be satisfactory. The Ministry adopted one of these as the final plan.				
Evidence: Several alternative harvest rules were evaluated by ICES in 2017 and found to be satisfactory. The Ministry adopted one of these as the final plan. ⁷²				
References:	See footnotes.			
Non-Conformance Number (if relevant)	NA			

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
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. The ICES advice is published on the ICES websites and the MFRI advice is published on the MFRI website once they are ready.				
References:	See footnotes.			
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence: The advice published by the MFRI and ICES has reference points tabulated.				

71 http://www.ices.dk/sites/pub/Publication20Reports/Expert20Group20Report/acom/2011/WKBENCH%202011/WKBENCH_2011.pdf

72 <https://www.stjornarradid.is/efst-a-baugi/frettir/stok-frett/2017/07/04/Aflaregla-fyrir-islenska-sumargotssild/>

Evidence:

The advice published by the MFR⁷³ has reference points tabulated. These are identical to the reference points defined by ICES, and also includes the reference values in the harvest rule in the management plan.

Table 9. Summer-spawning herring. Reference points, values, and their technical basis. All weights are in tonnes.

Nálgun Framework	Gátmörk Reference point	Gildi Value	Grundvöllur Basis
Aflaregla Management plan	MGT $B_{trigger}$	200000 t	Aðgerðarmörk í aflareglu sem standast MSY viðmið ICES Trigger point in HCR considered consistent with ICES MSY framework
	HR _{MGT}	0.15	Slembireikningar í aflaregluhermun. Hlutfall af viðmiðunarstofni Stochastic HCR evaluation. Proportion of age 4+ biomass
MSY	MSY- $B_{trigger}$	273000 t	B_{pa}
Varúðarnálgun Precautionary approach	B_{lim}	200000 t	Hrygningarstofn með miklum líkum á skertri nýliðun SSB with high probability of impaired recruitment
	B_{pa}	273000 t	$B_{lim} * e^{1.645\sigma}$, $\sigma = 0.19$
	F_{lim}	0.61	F sem leiðir til B_{lim} miðað við meðal nýliðun F corresponding to B_{lim} with average recruitment
	F_{pa}	0.45	$F_{pa} = F_{lim} * \exp(-1.645 * \sigma)$, $\sigma = 0.18$

References: See footnotes.

Non-Conformance Number (if relevant)

NA

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:	The distribution range for Icelandic summer spawning herring is confined to Icelandic waters. Hence, decisions on management cover the whole stock distribution area.		
Evidence:	The distribution range for Icelandic summer spawning herring is confined to Icelandic waters. Hence, decisions on management in Iceland cover the whole stock distribution area.		
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:	Not Applicable. Icelandic summer spawning herring is not a shared stock.		
Evidence:	Not Applicable. Icelandic summer spawning herring is not a shared stock. In cases where Icelandic summer spawning herring may be mixed with other herring stocks in catches, the catch has to be landed and reported by stock, based on inspection of the gonads.		
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

⁷³ Advice published June 2018: https://www.hafogvatn.is/static/extras/images/Sild_2018729472.pdf

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: The TAC for the fishing year 2017/2018 was set by the Ministry according to the new harvest rule.			
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 herring for the fishing year 2017/2018 was set according to the new harvest rule.			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: Laws and regulations for conservation and sustainable use of the fish stocks around Iceland are valid also for herring. Rules specific for herring regulates fishing season, trawling ban inside the 12 nm limit as well as mesh size regulations in the gill net fishery.			
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 herring. Rather, the management of herring 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 herring, 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 as news in the Ministries web-pages. The fishery of the summer-spawning herring is further subject to regulations set by the Icelandic Ministry of Fisheries in 2006 (no. 770, 8. September 2006) ⁷⁴ . According to this regulation, fishery of juvenile herring (27 cm and smaller) is prohibited and to prevent such a fishery, area closures are enforced. The fishery can take place from 1 st September to 31 st May each fishing season (1 st September to 31 st August) in nets, purse seines and mid-water trawls. The mid-water trawling is only allowed outside of the 12 nautical miles zones with some additional area restrictions. Use of sorting grids in the mid-water trawls can be required in some areas, if necessary to avoid bycatch when gill-nets are used in the herring fishery, the minimum mesh size (stretched) is 63 mm.			
References:	See footnotes.		
Non-Conformance Number (if relevant)			NA

⁷⁴ <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553>

8.1.5.7 Clause 1.5.7.

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

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>		None <input checked="" type="checkbox"/>
Summary Evidence:			
The practical implementation of management decisions 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 Clause 1.1.3, the practical implementation of management decisions 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.			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>		None <input checked="" type="checkbox"/>
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. Historically, catches have deviated from the TAC in both directions (17% below to 13% above) since 2010. So far, there is no experience after the new harvest rule was introduced.			
Evidence:			
There is a wide range of measures to ensure that the total catch is in accordance with the decided TAC.			
<ul style="list-style-type: none"> • There is an obligation to land all catches, discarding is prohibited. Historically, discarding may have occurred when large year classes appeared. Presumably, this is a minor problem at present, 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 <ul style="list-style-type: none"> ○ 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. 			
Nevertheless, there may be some deviation of final catches from the decided TAC. Some reasons for that are readily identified:			
<ul style="list-style-type: none"> • Transfer of quotas between years, which is legal within bounds, which seems to explain most deviations of catches from TACs. • 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 6 under Clause 1.1.2 shows the recent historical record of adherence to the quotas, according to the MFRI advice ⁷⁵ . The deviations go in both directions. The largest deviations are 17% below and 13% above. The national TAC has followed the advice most of these years.			
References:	See footnotes.		
Non-Conformance Number (if relevant)			NA

⁷⁵ https://www.hafogvatn.is/static/extras/images/Sild_2018729472.pdf

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: Not Applicable. The Icelandic summer spawning herring is a domestic stock.			
Evidence: Not Applicable. The Icelandic summer spawning herring is a domestic 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 fisheries⁷⁶.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: Not Applicable. Stock abundance is estimated by a full analytic assessment. Accordingly, using generic evidence as a fall back is not necessary.			
Evidence: Not Applicable. Stock abundance is estimated by a full analytic assessment. Accordingly, using generic evidence as a fall back is not necessary.			
References:	See footnotes.		
Non-Conformance Number (if relevant)			NA

⁷⁶ 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 enforcement⁷⁷.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
<p>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.</p> <p>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.</p> <p>Note: Acts/Laws and Regulations referenced herein may be accessed (<i>in Icelandic</i>) 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).</p>				
Evidence:				
<p>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)⁷⁸, 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, Port Authorities and the MFRI⁷⁹.</p> <p>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 33).</p>				

77 2005 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.

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

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

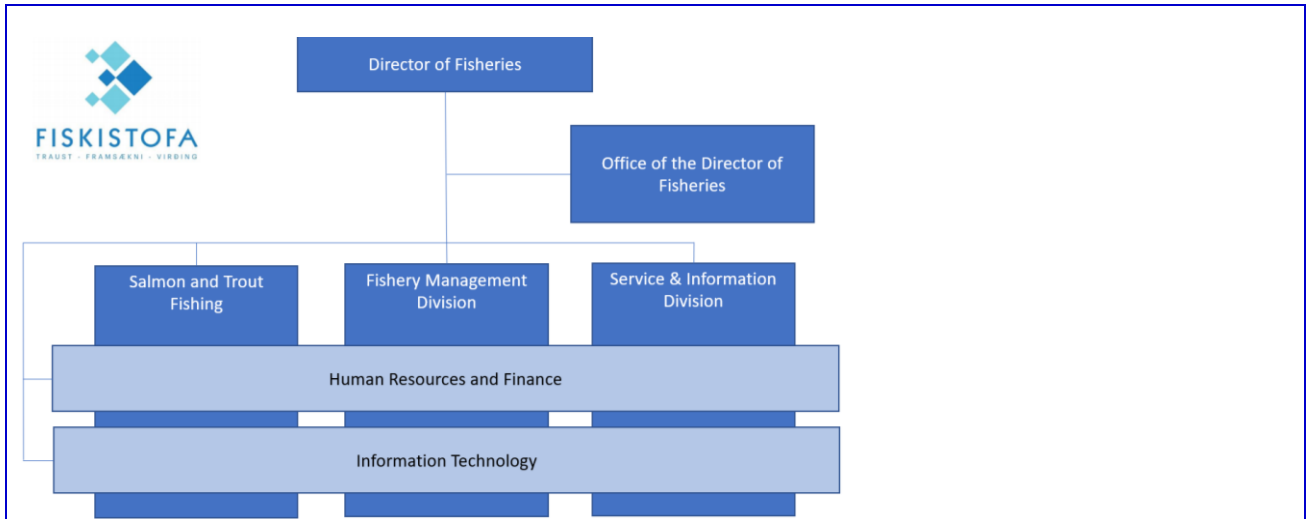


Figure 33. Directorate of Fisheries organisational chart and staff (Source: www.fiskistofa.is).

The primary legislative instrument relating to fisheries management in Iceland and the basis for the ITQ system is the Fisheries Management Act 116/2006⁸⁰. It supersedes the Fisheries Management Act 1990 and established allocation harvest rights and permit requirements for all participating commercial fishing vessels. These permits 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)⁸¹. 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 1996⁸²). Provisions of the Act on a Special Fee for Illegal Marine Catch⁸³ 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)⁸⁴ specifies the Icelandic EEZ and prohibits foreign vessels from fishing within Iceland’s EEZ (unless by prior agreement). It sets out the area 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.

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 to monitor and publish information on catches of the fleet (Articles 2-3) and stipulates that fish caught within the Icelandic EEZ, or during trips where a proportion of fishing take place within the EEZ, must be landed to an officially recognised port (Article 5).

80 <https://www.althingi.is/lagas/149a/2006116.html>

81 <https://www.icetra.is/maritime/ships-and-cargoes/>

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

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

84 extwprlegs1.fao.org/docs/texts/ice89476.doc

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 Resources⁸⁵. The Fishery Management Act also makes provisions for processing at sea, weighing by auction houses and the transfer of quotas to cover landings.

During surveillance site visits for other already certified fisheries assessors witnessed the landing, transfer to auction, weighing, tipping, re-icing and sale of fish using the electronic auction system as well as the labelling of catch for the purposes of traceability. The official weights are the sold and registered weights recorded on the official calibrated scales by licensed operators (both of which are audited by the Fisheries Directorate) and these are then submitted to the Directorate's central database. As required by Article 10 of Regulation No. 745/2016, each landing generates a receipt^{86,87} 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 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.

The ITQ system has rules and flexibilities to allow for corrective management measures and adjustments; 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).

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

86 <https://www.fmis.is/blank>

87 <http://www.unuftp.is/static/fellows/document/pan09prf.pdf>

A separate hook and line quota system (Aflamark - krókaflamark) is available for small vessels less than 15 gross tonnage (GT). These are only allowed to fish with handlines or longlines. These vessels 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 vessels⁸⁸.

Each fishing year the Minister shall have available harvest rights amounting to up to 12,000 tonnes of un-gutted 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 more than 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% of the quota held for each individual demersal species. This authorisation does not apply to fishing more than the allocated catch quota of cod. Vessels may also fish up to 5% more than their catch quota for each demersal species, herring, deepwater shrimp and Nephrops with the excess catch being deducted from their allocated catch quota for the following fishing year. Vessels may transfer up to 15%⁸⁹ of catch quotas for each demersal species, oceanic shrimp, Nephrops and herring from one year to the next 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)⁹⁰. The max 20% return on VS catches means that there are limited incentives to land it; however, the VS catch provision allows vessels the flexibility 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 who monitor 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 34 shows the number of boardings undertaken by the Coast Guard since 2005. In 2017, the Coast Guard conducted 155 vessel boardings, a decrease on the corresponding number of 216 in 2016. The Coast Guard also undertake aerial surveillance, amounting to 166 hours in 2017 which is lower than 2015-2016 when over 200 hours were flown (Figure 35).

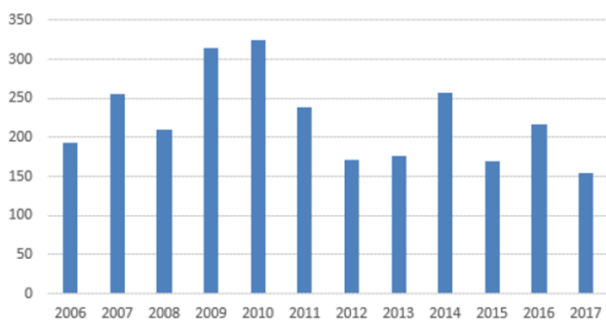


Figure 34. Number of inspections by the Coast Guard from 2005 (Source: Presentation to the assessment team).

⁸⁸ <http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Krokaaflamarksbatar>

⁸⁹ Act No. 116/2006 as amended by Act No. 22/2010

⁹⁰ http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Sveigjanleiki_i_aflamarskerfinu

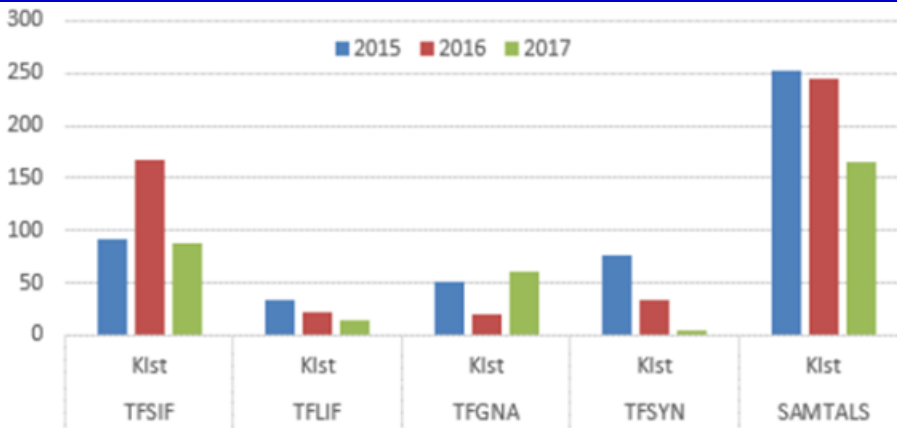


Figure 35. Air surveillance 2015-2017. The final column (Samtals) shows total hours air surveillance flown, whilst the other columns show hours by individual aircraft (Source: Coast Guard presentation provided to the assessment team, December 2018).

Days spent by Fisheries Directorate inspectors at sea inspecting vessels as a proportion of total fishing effort is shown in Table 10 below **Error! Reference source not found.**

Table 10. 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 (below **Figure 36**). The most significant numbers of infringements related to manning lists (lögskráningar) and seaworthiness (Haffæri).

Only one infringement relating to fisheries (Veiðar) was recorded in 2017. Foreign vessels are also inspected – both in the Icelandic EEZ and further afield as part of Iceland’s contribution to monitoring and surveillance as a member of NEAFC. In 2017, 18 foreign vessels were inspected which, in relation to fishing activities in the Icelandic EEZ, led to remarks to 2 Norwegian capelin fishing vessels due to gear infringements and to a Faroe Islands handline/jigger vessel for logbook infringement.

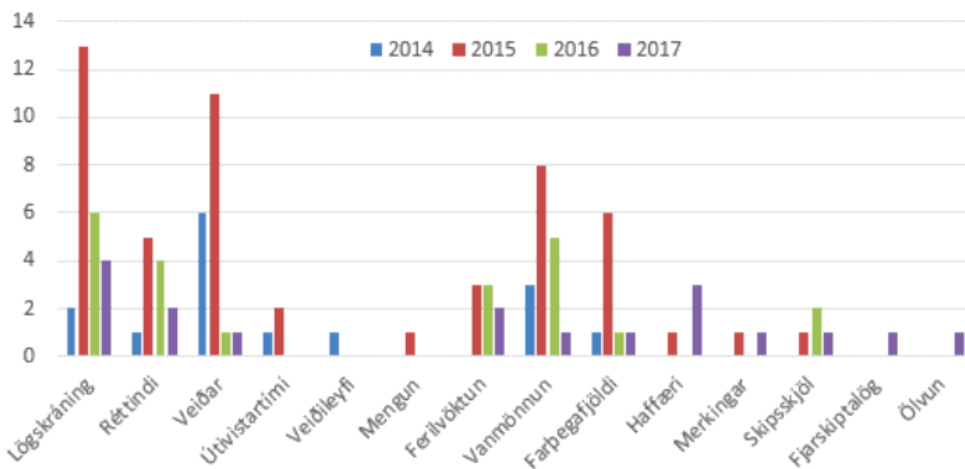


Figure 36. Reasons for the generation of remarks, by no. of remarks generated, during Coast Guard inspections in 2014-2017; Lögskráningar – Manning list, Réttindi – License, Veiðar – Fishing, Útivistartími – Time limits, Veiðileyfi – Fishing permit, Mengun – Pollution, Ferilvöktun – VMS, Vanmönnum – 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).
Measuring for juvenile fish in catches during Coast Guard inspections led to 5 short term (juvenile) closures in 2017, compared to 6 in 2016.

In their annual report, the Fisheries Directorate publish a comprehensive summary of suspected offenses recorded during maritime surveillance and the enforcement action subsequently taken (Tables below). A comparison of some of the enforcement action taken in recent years is shown in the figure 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 (1201 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 were 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 11. Overview of suspected offenses in Icelandic fisheries (Source: Fiskistofa Annual Reports 2017⁹¹ and 2016⁹²).

Offenses recorded by Fiskistofa	2017	2016
Violation of landing rules:	52	60
• <i>Not landing fish at official landing location</i>	5	4
• <i>Weighing container</i>	10	13
• <i>Misreporting (Landing full size fish as part of catches of juveniles)</i>	9	22
• <i>Incorrect specification of species</i>	11	4
• <i>Other</i>	17	17
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:	719	689
• <i>Not submitting logbooks on time</i>	674	657
• <i>Other</i>	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 12. 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

91 Fiskistofa 2017 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/medferd_mala_og_urskurdir.pdf

92 Fiskistofa 2016 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/kafli8_2016.pdf

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

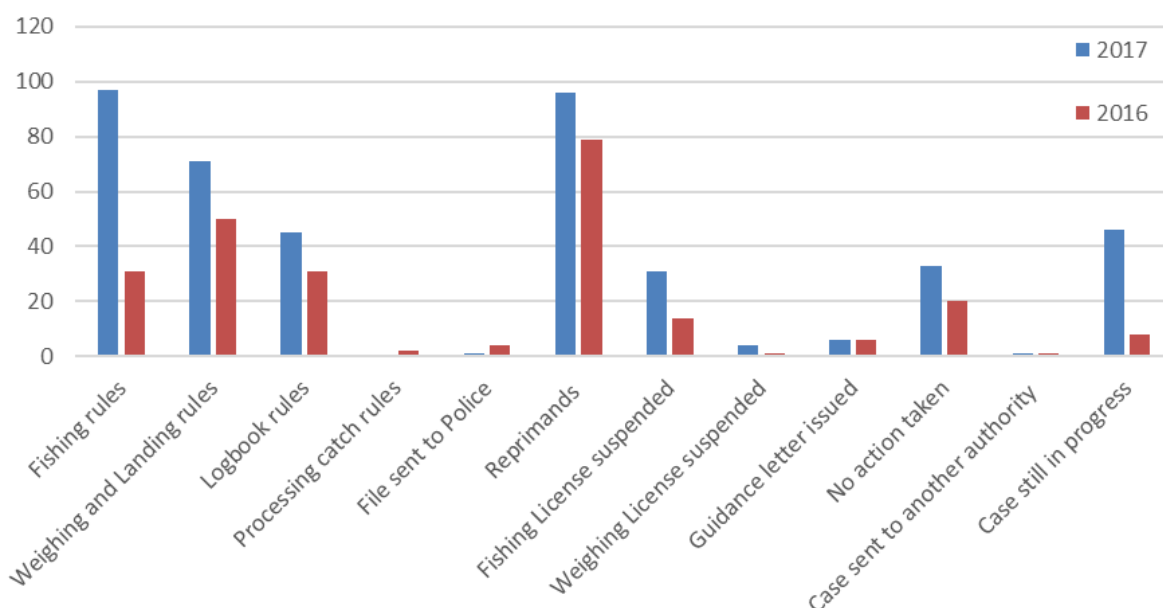


Figure 37. Comparison of some of the main areas of enforcement action taken by the Fisheries Directorate in recent years. The first four columns show the offence and the remaining columns show the enforcement action subsequently taken (Source: SAIG, based on Fiskistofa Annual Report 2017 and 2016).

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Laws and regulations concerning conservation and management measures are publicly available on the Ministry of Industries and Innovation website and are 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:	
<p>As previously discussed laws and regulations concerning conservation and management measures are publicly available and may be accessed (<i>in Icelandic</i>) via http://www.althingi.is/lagasafn/ (for Acts/Laws) and https://www.reglugerd.is/ (for Regulations). They 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)⁹³.</p> <p>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.⁹⁴</p> <p>All advice to managers relating to the status of commercial stocks which underpins decisions on TACs and other regulations is also available⁹⁵. Harvest control rules are scrutinised on request by an independent scientific body (ICES) with reports being published online.</p> <p>Up-to-date maps of fisheries closures are available on-line on the Fisheries Directorate website⁹⁶. 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 website⁹⁷</p>	
References:	See footnotes.
Non-Conformance Number (if relevant)	NA

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
None <input checked="" type="checkbox"/>			
Summary Evidence:			
<p>Landings must be recorded in logbooks at sea and these are verified and standardised through weighing at accredited weigh stations in landings ports throughout Iceland. Registered weights for each landing are sent to the Fisheries Directorate, recorded on their catch registration database (GAFL), and the appropriate amount is subtracted from the vessels quota. ITQ transfers are monitored to ensure that vessels either have or source sufficient quota to cover the entirety of their catch within 3 days of landing. Compliance is checked through at-sea and on-land monitoring by the Coast Guard and Fisheries Directorate inspectors with enforcement action taken where non-compliance occurs (see clause 2.1.1).</p>			
Evidence:			
<p>Catches and landings in Iceland are monitored and recorded in a number of complementary ways. Logbooks, either electronic (e-logs) or standard paper based, depending on the vessel record landings at sea and these are verified and standardised through physical weighing at accredited weigh stations in landings ports throughout Iceland.</p> <p>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</p>			

⁹³ <https://www.stjornartidindi.is/>

⁹⁴ <http://www.fiskistofa.is/>

⁹⁵ <https://www.hafogvatn.is/en/harvesting-advice>

⁹⁶ <http://www.fiskistofa.is/fiskveidistjorn/veidibann/reglugerdarlokaniir/>

⁹⁷ <https://www.hafogvatn.is/is/skyndilokanir>

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.

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 with the added stipulation in the herring fishery that catches must be taken between 1st September and 31st May. 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 ISS herring. 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.

In 2016 ICES and MRI advised that catches of ISS herring in the 2017/2018 fishing season, based on the 2017 stock assessment and in accordance with the accepted HCR, should be no more than 38,712 t. The TAC for ISS herring set by Icelandic authorities in the quota year 2017/2018 was 39,000 t and total catches were approx. 35,034 t or approx. 10% less than the TAC (Table 13).

Table 13. Icelandic summer-spawning herring. ICES advice, agreed TACs and catches (1984 – 2018/2019) (Source: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/her.27.5a.pdf>).

Year	ICES advice	Catch corresponding to advice	Agreed TAC	ICES landings	ICES discards
1984		50000	-	50304	0
1985		50000	-	49368	0
1986		65000	-	65500	0
1987	F _{0.1}	70000	72900	75439	0
1988	F _{0.1}	~100000	90000	92828	0
1989	F _{0.1}	95000	90000	97270	3700
1990/1991**	Status quo F	90000	100000	101632	3500
1991/1992**	F _{0.1}	79000	110000	98538	11000
1992/1993**	F _{0.1}	86000	110000	106653	1800
1993/1994**	No gain in yield by fishing higher than F _{0.1}	110000*	110000	101496	1200
1994/1995**	No gain in yield by fishing higher than F _{0.1}	83000*	130000	131994	2000
1995/1996**	No gain in yield by fishing higher than F _{0.1}	120000*	110000	124963	900
1996/1997**	No gain in yield by fishing higher than F _{0.1}	97000*	110000	95882	0
1997/1998	No gain in yield by fishing higher than F _{0.1}	90000*	100000	64931	0
1998/1999	No gain in yield by fishing higher than F _{0.1}	90000*	90000	87238	0
1999/2000	Current F is sustainable	100000*	100000	92896	0
2000/2001	Current F is sustainable	110000*	110000	100332	0
2001/2002	Current F is sustainable	125000*	125000	95675	0
2002/2003	Current F is sustainable	113000*	105000	96208	0
2003/2004	Current F is sustainable	113000*	110000	125717	0
2004/2005	F = 0.22	106000	110000	114237	0
2005/2006	Status quo catch	110000	110000	103043	0

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

2006/2007	Status quo catch	110000	130000	135303	0
2007/2008	Average of the last 3 years' catch	117000	150000	158917	0
2008/2009	$F_{pa} = 0.22$	131000	130000	151780	0
2009/2010	$F_{pa} = 0.22$	75000	40000	46332	0
2010/2011***	Domestic advice autumn 2010	40000	40000	43533	0
2011/2012***	Domestic advice autumn 2011, no fishery until then	40000	45000	49446	0
2012/2013	$F_{MSY} = 0.22$	67000	68500	71976	0
2013/2014	$F_{MSY} = 0.22$	87000	87000	72058	0
2014/2015	$F_{MSY} = 0.22$	83000	83000	94975	0
2015/2016	$F_{MSY} = 0.22$	71000	71000	69729	0
2016/2017	$F_{MSY} = 0.22$	63000	63000	60403	0
2017/2018	$HR_{MGT} = 0.15$	38712	39000	35034	0
2018/2019	Management plan	35186			

* Catch at $F_{0.1}$.

** Season starting in October of first year.

*** No advice was given by ICES until new information on *Ichthyophonus* infection was available from survey monitoring in the following autumn.

As can be seen from Table 13 above and Figure 38 below, since the beginning of the time series catches of ISS herring have fluctuated around parity, with TACs being overshoot in some years and undershoot in others. There is no clear pattern of catches consistently exceeding TACs. Catch balancing mechanisms contribute to TAC overshoots in some years. For example, a 14% TAC overshoot in 2014/2015 resulted, at least in part, from a 17% TAC undershoot in 2013/2014 and the subsequent transfer of a positive quota balance from 2013/2014 to 2014/2015 see Figure 38 below. Over time these inter-annual transfers should balance themselves out and an examination of the last 20 fishing seasons show that, while there have been both over and undershoots in that time, total catches across the period are within 0.1% of total TACs.

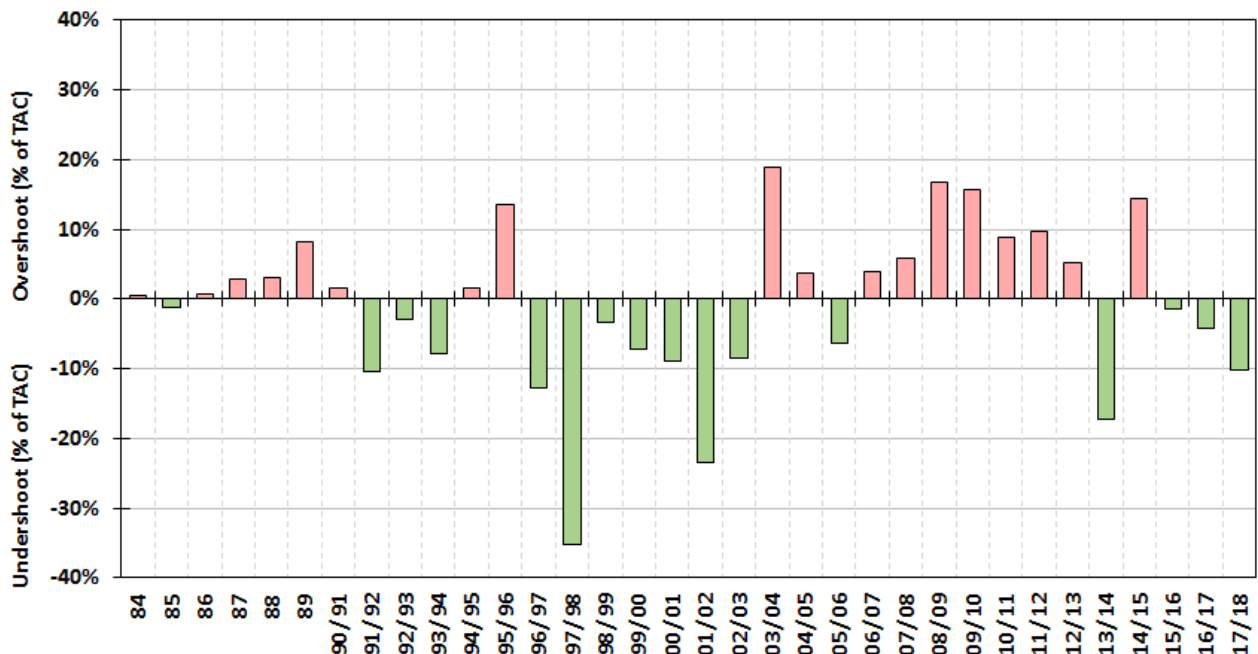


Figure 38. Total landings of ISS herring % under/over TACs (1984 – 2017/2018) (Source: MRI 2018¹⁰⁰).

In June 2018 MFRI and ICES advised that catches of ISS herring 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 35,186 t.

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

100 http://dt.hafogvatn.is/astand/2018/30_sild.html

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
<p>Monitoring, surveillance and information feed-back is used to collate information on actual catch. Registered weights for each landing are sent to the Directorate, where it is compared to the e-logbook data for the fishing trip, before the appropriate amount is subtracted from the vessel's quota. The official weights used are the standardised registered landing weight with logbook records being used as a supplementary source to cross-check landings.</p>				
Evidence:				
<p>The Fisheries Directorate have at their disposal several 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.</p> <p>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.</p> <p>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 vessel's quota and management purposes by staff at the Directorate.</p> <p>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).</p>				
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
<p>Corrective management measures/adjustments in management decisions are implemented where appropriate. While specific examples from the fishery under assessment here are not available an example of corrective management measures in the form of adjustments to quota allocations being implemented in another fishery currently certified under the IRF Certification Programme is presented below.</p>				

Evidence:

Corrective management measures including appropriate adjustments to TACs are implemented where appropriate. While specific examples do not exist in the herring fishery, there have been numerous examples in other fisheries such as was the case with the haddock fishery outlined below.

The Issue

From the late-1990s on haddock catches have generally exceeded TACs, often by considerable margins, due to inter-annual and inter-species transfers, VS catches and catches by foreign vessels (Figure 39).

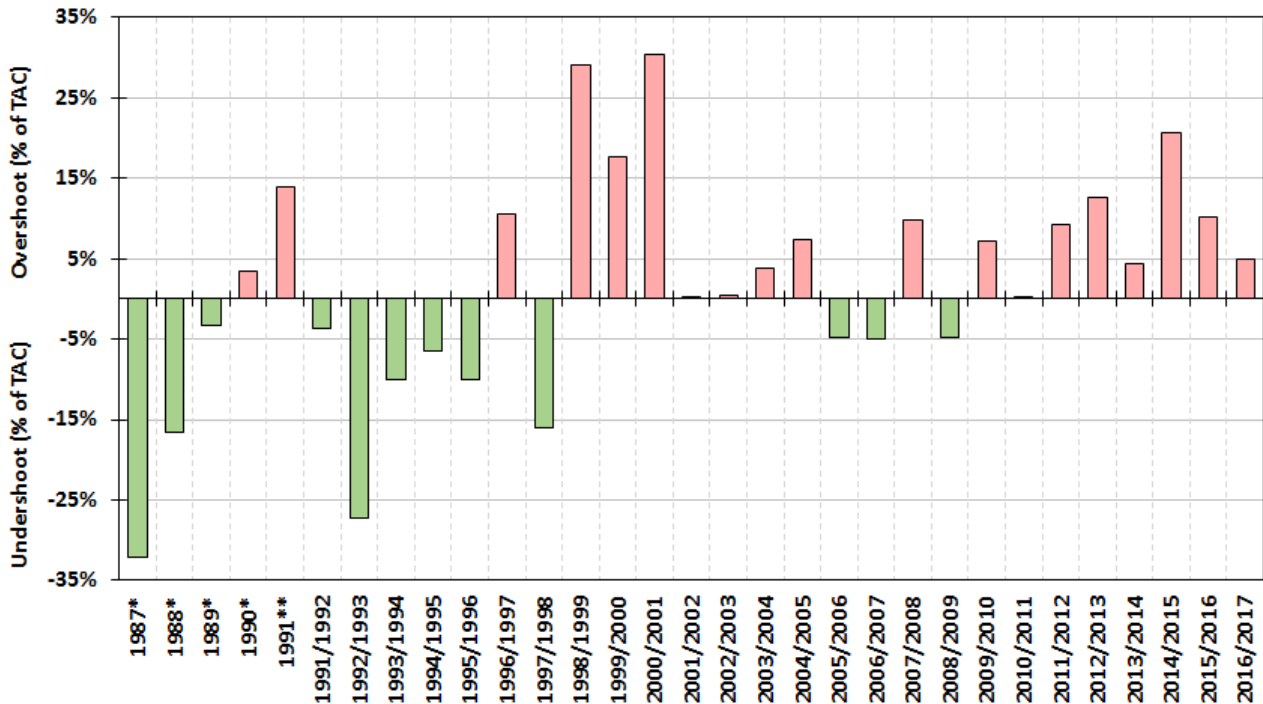


Figure 39. Total landings of Icelandic haddock % under/over TACs (1987 to 2016/2017) (Source: data from MRI 2018¹⁰¹ and ICES, 2018¹⁰²).

The solution

A review of the composition of excess haddock catches in the 2014/2015 fishing season, conducted by the Icelandic Ministry of Industries and Innovation, revealed that the two largest contributory factors to excess catches in that fishing season were the Ministry’s inability to obtain sufficient quota from the quota exchange “pot” to balance allocations and greater than anticipated catches by foreign vessels (which were not included within the allocated TAC). In response the Ministry compensated for those excess catches in 2014/2015 by not allocating approx. 1,100 t of haddock quota in 2015/2016 with that amount instead being retained by the Ministry as a “reserve”. This adjustment is evidenced by “special” allocations of haddock quota for the 2015/2016 season resulting in the removal of 967 t of haddock quota, representing 1,151 t live-weight of haddock, from the ITQ allocation system¹⁰³

In addition to the types of adjustment outlined above under the current haddock management plan HR_{MGT} is set at an additionally precautionary 0.4, well below both HR_{pa} (0.46) and HR_{MSY} (0.52). The result of this increased “buffer” means that the management system for haddock 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

101 https://www.hafogvatn.is/static/extras/images/Ysa_2018729280.pdf

102 <http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/had.27.5a.pdf>

103 <http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/?skipnr=0&timabil=1516&fyrirspurn=UmSkip&landhelgi=i>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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.			
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 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, and 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:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
As the share of the TAC allocated to vessels is based on the number of shares for that 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 vessel can 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 ¹⁰⁴ .			

¹⁰⁴ <http://www.fiskistofa.is/veidar/aflaheimildir/aflahlutdeildalisti/>

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:	See footnotes.
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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 ISS herring. 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 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) ⁸¹ .			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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 via the Fisheries Directorate website. The Fisheries Directorate maintain a catch registration system (GAFL database) which is updated with information on registered catches from ports of landing and information on catches exported unprocessed. The catch statistics are published, subject to change, once they have been compared to submitted logbooks and reports from buyers, and are available on the Fisheries Directorate website.			
Evidence: The catch quota of each vessel or vessel group for each fish species and fishing year is available on the Fisheries Directorate website. For each vessel the information available for each species is: <ol style="list-style-type: none"> 1. Allocated quota (initial allocation of quota from the overall TAC based on no. of shares) 2. Compensations (quota gained/lost through compensations) 3. Quota transferred from the previous year (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 14 shows the first 10 lines of the publicly available data on individual vessels' quota allocations of ISS herring in the 2016/2017 fishing season. Accordingly, information on the size and composition of the fleet of fishing vessels is available and documented, and the catch quota of each vessel or vessel group, along with the fishing year is recorded in the official central database (GAFL) in a transparent manner and is publicly accessible.

Table 14. First 10 lines of table showing the Icelandic summer-spawning fleet TAC allocation, transfer, balances and catches (in tonnes) for the 2016/2017 fishing season (Source: Fiskistofa¹⁰⁵).

Reg. no.	Vessel	Class	Alloc. quota	Compensations	Trfr. prev. year	Trfr. b/t vessels	Allowed catch	Catch	Balance	Over fished
1277	Ljósafell SU 70	A	0	2,139	0	-2,139	0	0	0	0
1578	Ottó N Þorláksson RE 203	A	0	0	0	0	0	0	0	0
1579	Gnúpur GK 11	A	1	0	0	133	134	134	0	0
1742	Kap VE 4	A	3,350	0	313	0	3,663	3,539	124	0
1972	Hrafn Sveinbjarnarson GK 255	A	0	0	0	116	116	116	0	0
1977	Júlíus Geirmundsson ÍS 270	A	669	0	112	-565	216	161	55	0
2203	Þerney RE 1	A	0	0	0	0	0	0	0	0
2354	Valdimar GK 195	A	0	0	0	0	0	0	0	0
2388	Ísleifur VE 63	A	2,681	0	303	0	2,984	2,933	51	0
2407	Hákon EA 148	A	4,172	0	253	1,660	6,085	5,442	643	0

Registered catches are based on information from ports of landing and information on catches exported unprocessed. The catch statistics are published, subject to change, once they have been compared to submitted logbooks and reports from buyers, and are available on the Fisheries Directorate website¹⁰⁶.

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:

- 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;¹⁰⁷
- 4) For the stock under consideration, the allowed catch by species for each vessel or vessel group shall be specified.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

Summary Evidence:

Information on the size and composition of fishing fleet is available, documented which 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 aforementioned vessel registry can be granted a permit. The allowed catch of ISS herring for each vessel or vessel group is specified on the Fisheries Directorate website.

¹⁰⁵ <http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/>

¹⁰⁶ <http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en>

¹⁰⁷ 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.

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 footnote.
Non-Conformance Number (if relevant)	NA

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>The Icelandic Coast Guard, working closely with the Fisheries Directorate, administers an integrated monitoring, control and surveillance system which covers the activities of Icelandic and foreign fishing vessels. 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).</p> <p>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. At-sea inspections are undertaken by the Coast Guard and inspectors from the Fisheries Directorate. The Directorate's inspectors also undertake in-port inspections.</p> <p>Surveillance is strategic and risk-based, using information supplied by the Fisheries Directorate to identify highest risk activities where monitoring effort is then concentrated, for example, at present on the gillnet fisheries. VMS is used by the Coastguard to enforce temporary and long-term fisheries closures. 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.</p>			
Evidence:			
<p>The Icelandic Coastguard (ICG) 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 Centre¹⁰⁸. The importance of the fisheries sector to the Icelandic economy and the need for greater efficiency has led to high levels of collaboration and integration resulting in creative and dedicated approaches to fisheries management and enforcement. For example, the Directorate of Fisheries produce a risk analysis for the Coast Guard, enabling a strategic, risk-led approach to surveillance and best use of available resources over the large area monitored. The fisheries MCS system in Iceland has at its core the effective use of available technology meaning relatively small staff numbers can achieve extensive monitoring of the Icelandic fishing industry.</p> <p>The MCS 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 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.</p>			

¹⁰⁸ http://www.lhg.is/media/LHG80/Landhelgisgasla_Islands_enska2_.pdf

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

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 traditional surveillance methods 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).

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 40).

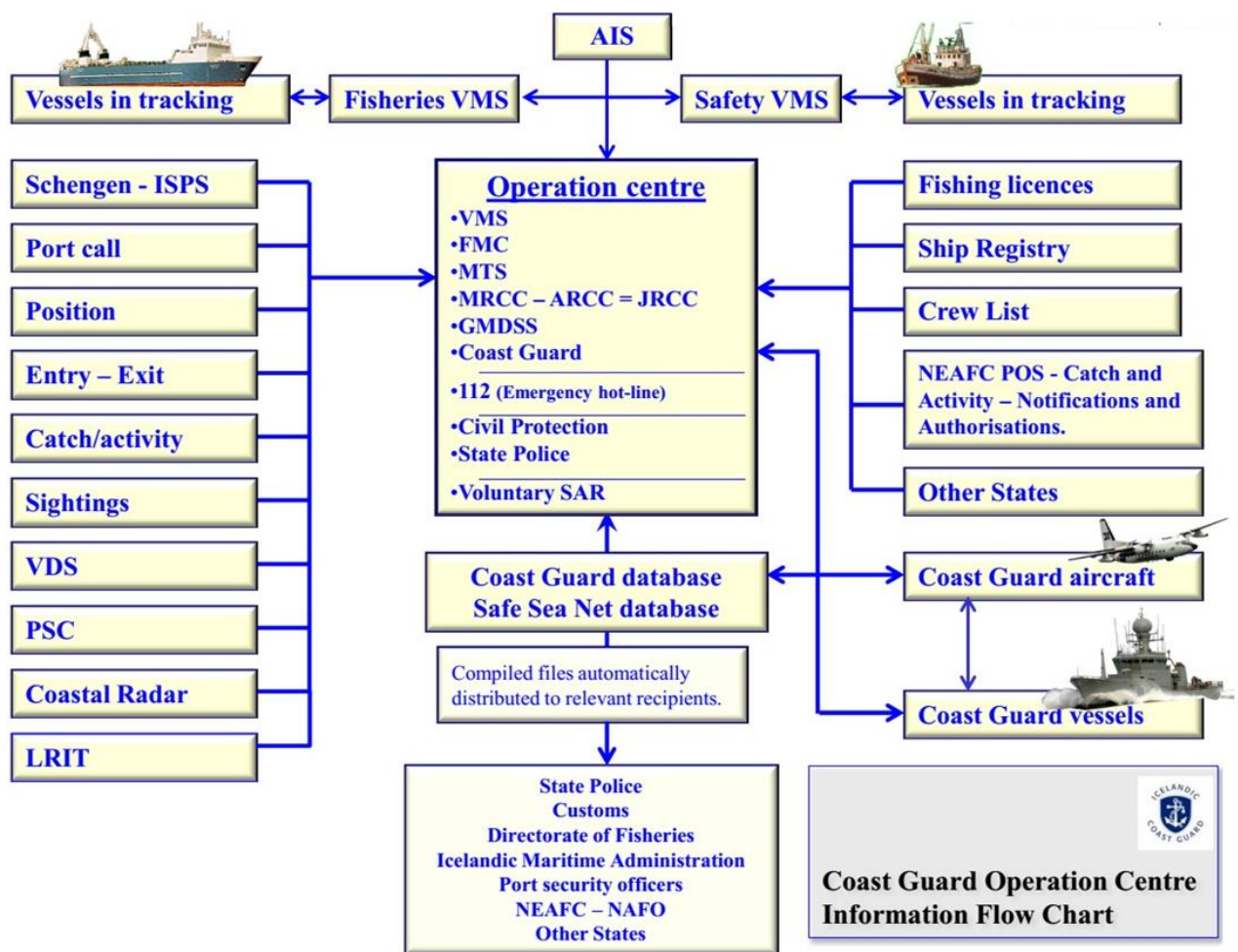


Figure 40. Schematic outlining the integrated MCS system in Iceland (Source: presentation entitled Iceland’s application for membership of the EU. Chapter 13, 28 February Icelandic Coast Guard ERS/VMS/AIS¹⁰⁹).

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

109 <https://slideplayer.com/slide/4644333/>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: The fishing gear as well as the composition of the catch and its handling onboard the fishing vessels are subject to inspection. 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. Fisheries Directorate 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 ^{110,111} . 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. Further information is presented in clauses 2.1.1 and 2.3.2.1.			
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

8.2.3.2.3 Clause 2.3.2.3.

Areas closed from fishing shall be monitored by the authorities.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: Areas closed to fishing are monitored by the authorities primarily the Icelandic Coastguard using the VMS system. Vessels fishing in proximity to closed areas are monitored at the Coast Guard Operation Centre and vessels are directly contacted if they encroach on prohibited areas.			
Evidence: 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 decide to escalate if necessary. Further information on the Coast Guard Monitoring, Control and Surveillance system is presented in clause 2.3.2.1.			
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

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

111 Fiskistofa Annual Report, 2017. Maritime surveillance chapter. <http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/eftirlit-a-sjo/>

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 <input type="checkbox"/>	Medium <input checked="" type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input checked="" type="checkbox"/> None <input type="checkbox"/>
<p>Summary Evidence: Although required by legislation, there is some evidence of non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be fully confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks. Therefore, the Assessment Team have deemed a Minor Non-conformance to be appropriate in this instance. Following the issuance of this non-conformance, and in accordance with rules of the IRF Programme, the Client has submitted a Corrective Action Plan (CAP) to address the non-conformance raised within a defined period. Corrective Actions in place are to be reviewed annually at surveillance audits.</p>			
<p>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.</p> <p>The recording of marine mammals and seabirds by number and species is required by Icelandic regulation¹¹².</p> <p>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 <i>et al.</i> 2015¹¹³ and the March 2018 MFRI report titled: "Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017".</p> <p>Pálsson <i>et al.</i> 2015 highlighted the fact that their bycatch estimates were based on limited data that needed to be increased and improved with a functioning reporting system for the fishery and better follow up. 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 2017¹¹⁴. 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 inspector is present vs logbook records".</p> <p>While much of the evidence related to non-compliance with reporting requirements may relate to the lumpsucker fishery, this fishery is still part of the management system under review and in addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better; 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.</p> <p>Non-conformance #1 (Clause 2.3.2.4: Minor Non-conformance) Although required by legislation, there is some evidence non-reporting/under-reporting of seabirds and marine mammal 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.</p> <p>Status: Open. Corrective Actions in place to be reviewed annually at surveillance audits</p>			

¹¹² <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967>

¹¹³ <https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf>

¹¹⁴ <https://www.hafogvatn.is/static/files/skjol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf>

A corrective action plan against this non-conformance has been provided under the 10. Non-conformances and Corrective Actions section of this report. Please refer to it for further detail.	
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
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) ¹¹⁵ . 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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
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.				
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:	See footnotes.			
Non-Conformance Number (if relevant)	NA			

¹¹⁵ <https://www.stjornartidindi.is/Advert.aspx?RecordID=42a16a67-60a7-4ae7-ad7c-0f53fc254654>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
None <input checked="" type="checkbox"/>			
Summary Evidence:			
Discarding of ISS herring 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. The Coast Guard is currently investigating additional means to enhance detection of discarding.			
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 ISS herring. 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 ¹¹⁶ (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			
Coast Guard are also investigating other ways to enhance the detection of discarding drawing on experience elsewhere (Norway) and other technologies including aerial surveillance (pers. com. site visit, November 2018).			
Comparison between 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		

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

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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, through the laws and regulations summarised in clause 2.1.1 and compliance is monitored through remote surveillance and inspections at sea and on land by the Coast Guard and the Fisheries Directorate with penalties applied where violations are detected. See evidence presented in clause 2.1.1.			
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:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Monitoring and control measures are in place. The Icelandic management model has been designed to promote compliance through reporting and includes provisions which create flexibility, enabling fishers to avoid non-compliance with rules and regulations and effectively encourages compliance. The rapid reporting system further encourages compliance through near real-time information on the catch of each vessel, quota allocation and transfers. This transparency in effect introduces an element of 'self-policing' into the management system.			
Evidence:			
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 footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>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.</p>			
Evidence:			
<p>The Treatment of Commercial Marine Stocks Act 57/1996¹¹⁹ 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).</p> <p>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 website¹²⁰. Landings were previously permitted at authorised foreign ports but this is no longer the case following Regulation No. 745/2016 (Article 1)¹²¹.</p> <p>Authorised fishing ports provide the necessary facilities for handling and officially weighing landings including accredited weighing stations and officially licensed scale operators. Act 57/2006, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources¹²² also make provisions for processing at sea, weighing by auction houses and transfer of quotas to cover landings and allowances for ice in the weighing process.</p> <p>During surveillance site visits for other already certified fisheries assessors witnessed the landing, transfer to auction, weighing, tipping, re-icing and sale of fish using the electronic auction system as well as the labelling of catch for the purposes of traceability. The official weights are the sold and registered weights recorded on the calibrated scales and these are then submitted to the central database.</p>			
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>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.</p>			
Evidence:			
<p>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 the table below.</p>			

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

120 <http://www.fiskistofa.is/fiskveidistjorn/vigtunafla/>

121 <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0745-2016>

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

Table 15. Species in the Icelandic quota system (Source:¹²³)

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

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 species¹²⁴. Some of these are species for which there is a ban on direct fishing (e.g. Atlantic halibut, certain sharks, etc...) but that are landed as part of the discarding prohibition. Others do not have a formal national TAC but are landed and sold commercially.

During the November 2018 site visit, the Assessment Team witnessed one Atlantic halibut landed at the Reykjavik Fish Market.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

Summary Evidence:

Landings are monitored by port authority officials and fisheries inspectors to ensure the correct weighing and registration of catches including the 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 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 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 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^{125,126} 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;

¹²³ <http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/>

¹²⁴ <http://www.fiskistofa.is/veidar/aflaupplýsingar/afliallartegundir/>

¹²⁵ <https://www.fmis.is/blank>

¹²⁶ <http://www.unuftp.is/static/fellows/document/pan09prf.pdf>

- 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 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 Directorate's 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 Directorate inspectors have unimpeded access to the facilities. This is known as a 'Home-weighing license'¹²⁷. 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 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.

Catches processed at sea are registered as processed weights using an officially approved yield which is monitored and verified by the Directorate. Weights at landing are checked at the processing base by Directorate staff. Processed weights are converted to live weight equivalents for deduction from each vessel's quota and management purposes by staff at the Directorate.

Monitoring of weighing license holders is risk-based with the aim of directing surveillance where it is most needed. Assessment of risk is based on various factors such as the quantity weighed, number of weighings, the number of vessels that land with the licensee concerned, etc. Recently, 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 catch¹²⁸. 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 not¹²⁹. The results of this monitoring are published on the 'news' page of the Directorate's website¹³⁰ as bi-monthly reports¹³¹.

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))¹³². 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 suspension of the weighing license holder for up to a year. The Directorate of Fisheries began applying this measure in autumn 2017.

References:	See footnotes.
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Non-Conformance Number (if relevant)	NA
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¹²⁷ <http://www.fiskistofa.is/fiskveidistjorn/vigtunafila/>

¹²⁸ Fiskistofa Annual Report, 2017. Maritime surveillance chapter. <http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/efirlit-a-sio/>

¹²⁹ Fiskistofa Annual Report 2017. <http://www.fiskistofa.is/umfiskistofu/arsskyrsla-2013/efirlit-a-landi/>

¹³⁰ <http://www.fiskistofa.is/umfiskistofu/frettir/>

¹³¹ <http://www.fiskistofa.is/umfiskistofu/frettir/ishlutfall-i-november-og-desember>

¹³² <https://www.althingi.is/altext/stjt/2017.048.html>

8.2.3.2.13 Clause 2.3.2.13.

Catch shall be weighed by species at landing.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Within two hours of landing catches are officially separated, weighed and recorded by accredited weighing stations and reported against the appropriate quota allocation following provisions outlined in law.			
Evidence:			
As noted in clause 2.1.1, within two hours of landing catches are officially separated, weighed and recorded by accredited weighing stations and reported against the appropriate quota allocation following provisions outlined in the Act No 57, 1996 concerning the Treatment of Commercial Stocks, and Regulation No. 745/2016 on Weighing and Recording of Marine Resources. As required by Article 10 of Regulation No. 745/2016, each landing generates a weighing receipt, recording: <ul style="list-style-type: none"> • 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 the Directorate. <p>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. The officially weighed catches are the official catch of record on which subsequent deductions from vessels' quota is based. See Clause 2.1.1 for further information.</p>			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
The weight (whole weight or gutted weight) by species of all catches and by-catch species is measured by authorised harbour officials at landing and recorded in the Fisheries Directorate's catch registration system.			
Evidence:			
Landings must be weighed (whole weight or gutted weight) by species of all catches (including the stock under consideration and non-target/by-catch species) within 2 hours of landing by an official weigher using calibrated scales. Following allowances for ice the official weight is recorded in the official central data base where it can be accessed by the Directorate for comparison with the corresponding logbook entry. 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 vessel’s quota and management purposes by staff at the Directorate.	
References:	See footnotes.
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence: There is systematic monitoring of landing, weighing and registration of catches with all catches being weighed and recorded at the port of landing by an official weigher using licensed scales before the official catch is recorded on a central catch registration system. The Fisheries Directorate compares information on catches from the portside official weighing system with the corresponding logbook entry for that landing and discrepancies/deviations are recorded and investigated.				
Evidence: As noted in clause 2.1.1, there is systematic monitoring of landing, weighing and registration of catches with all catches being weighed and recorded at the port of landing by an official weigher using licensed scales before the official catch is recorded on a central catch registration system (The Fisheries Directorate and Port Authorities database, GAFL). The Fisheries Directorate compares information on catches from the portside official weighing system with the corresponding logbook entry for that landing before the appropriate reduction is made to the vessel’s quota. At this point in the discrepancies/deviations between the declared and official records of a landing are detectable if present and are recorded. Depending on the nature of the discrepancy/deviation the Fisheries may then decide whether or not further action is warranted.				
References:	See footnotes.			
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence: Data related to landings are processed in the Directorate’s database and catches are subtracted from vessels’ quotas. Deviations where they occur can sometimes be rectified using the flexibility within the system (e.g. by using inter-annual, inter-vessel or inter-species transfers to cover catches of a species for which the vessel did not already have quota). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines.				
Evidence: Data related to landings are processed in the Directorate’s database and catches are subtracted from vessels’ quotas. The system is designed such that reports are received in near real-time so that the Directorate can act quickly if vessels are approaching the end of their quotas. In addition vessels are aware or can easily check online their current quota status for a particular species. All processors purchasing fish, be it directly or at auction, are obliged to submit monthly reports to the Directorate. In addition, the fish auction reports all sales of fish directly to the Directorate. Deviations where they occur can sometimes be rectified using the flexibility within the system (e.g. by using inter-annual, inter-vessel or inter-species transfers to cover catches of a species for which the vessel did not already have quota). Excess catches which are not corrected using these flexibility measures can result in a revocation of fishing licenses and fines.				

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: See footnotes.

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.¹³³

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

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*) 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).

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 regulations¹³⁴. 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 115/2006¹³⁵. 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. Paragraph 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)¹³⁶
- 1012/2013, on fishing whelk in traps (Paragraph 5)¹³⁷
- 1070/2015, the fishing of crabs in the inner Faxaflói (Paragraph 4)¹³⁸ 923/2010, Monkfish-fishing (Paragraph 4)¹³⁹
- 449/2013 Regulation of equipment and nets fishing for trout (Paragraph 6)¹⁴⁰

Another important factor that contributes to low levels of lost fishing gear is the high price of that gear. This means that fishers are careful to avoid losing their gear. In the case of trawls the majority of vessels carry special grapples onboard that allow them to retrieve lost gear even when both towing warps have parted, which is a rare situation.

133 This clause is applicable to gillnets, traps and pots.

134 <http://vefbirting.odd.is/raduneyti/fiskveidar2018/108/>

135 <http://www.reglugerd.is/reglugerdir/allar/nr/115-2006>

136 <http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/20032>

137 <https://www.stjornartidindi.is/Advert.aspx?RecordID=024102ac-de04-45ce-99e3-5e83af6d6aae>

138 <http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/19883>

139 <https://www.stjornartidindi.is/Advert.aspx?RecordID=437308e0-8ad1-4009-98cb-10266317ed3e>

140 <http://www.reglugerd.is/reglugerdir/allar/nr/449-2013>

The Icelandic ITQ system allows for a slower paced fishery than would be expected if there was only an overall TAC with all boats fishing against it. The system allows fishers to target their efforts in optimum weather conditions leading to decreased rates of lost fishing gear.	
References:	See footnotes.
Non-Conformance Number (if relevant)	NA

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
Landed catches are subtracted from the relevant quotas (allowable catch) of the vessel or vessel group. Vessels must weigh catch within two hours of landing. The official weighed catch for each vessel is then submitted by the Port Authority to the Fisheries Directorate’s catch registration system and deducted from the vessel’s quota. Comparison of the official weighed catch is made with the vessel’s logbook as part of this process. Transfers of quota to meet any shortfall are also monitored to ensure any additional quota required is secured. Processed at sea catch is also monitored, including its conversion to live weights which are then deducted from the vessel’s quota.				
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 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 and verified by the Directorate. Weights at landing are checked at the processing base by Directorate staff. Processed weights are converted to live weight equivalents for deduction from each vessels quota and management purposes by staff at the Directorate.				
References:	See footnotes.			
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary Evidence:				
Some flexibility occurs in the quota management system so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels and to discourage discarding. This includes provision for some limited quota transfer between different species using ‘cod-equivalents’.				
Evidence:				
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. 116/2006¹⁴¹. Note that it is not possible to convert quota of other species for cod quota (e.g. cod quota may be exchanged for ISS herring quota, but ISS herring quota may not be exchanged for cod).

The cod-equivalent values of several species in recent seasons are presented in Table 16. As can be seen the cod-equivalent value for more commercially valuable species is consistently higher across seasons. Cod equivalent values change seasonally; for the 2017/2018 season the cod-equivalent value of ISS herring is 0.23

Table 16. 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
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 footnotes.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

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:

There is a degree of flexibility in the quota management system so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels. There are a variety of provisions in place to facilitate this flexibility and reduce any potential incentives relating to the discarding of fish:

A vessel can exceed its allocation for each demersal species, herring, deepwater shrimp and Nephrops 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 each demersal species, herring, deepwater shrimp and Nephrops 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.

¹⁴¹ <http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/>

It is also possible to make some limited quota transfer between different species. Interspecies transfers of quota are based on ‘cod-equivalents’ a nominal value based around the market value of cod which is set annually by the Ministry as set out in Article 19 of Act No. 116/2006¹⁴². Note that it is not possible to convert quota of other species for cod quota (e.g. cod quota may be exchanged for herring quota, but herring quota may not be exchanged for cod). The results of some of inter-vessel and inter-seasonal transfers aimed at balancing catches and quotas may be seen in under Clause 2.3.1.

Vessels may also decide not to include part of the vessels catch in its catch quota. This is limited to no more than 0.5% of the vessel’s pelagic catch and 5% of other marine catches per fishing year. Further this catch, known as ‘VS catch’, must be kept separate from the rest of the vessel’s catch and weighed and recorded separately; it must be sold at an approved auction and the bulk of the proceedings of the sale must go to the Fisheries Commission Project Fund (established by Act No. 37/1992), 20% going to the vessel (Article 11, Act No. 116/1996).¹⁴³ 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.

Icelandic law prohibits fishing vessels going to sea without sufficient quota (Act No. 57/1996). This is monitored by the Fisheries Directorate inspectors and Coast Guard and penalties apply under the Act for violations of its provisions including suspension of the commercial fishing license (Article 14), the requirement to have an inspector on board the vessel for a period of time up to two months paid for by the vessel (Article 16), fines, and in the event of major or repeated deliberate violation, imprisonment for up to 6 years (Article 23). See clause 2.1.1 for further information on the results of this surveillance and enforcement. Consequently, where a vessel has exhausted its quota (including availing of all the additional quota it is allowed to generate within the rules) the only option it is left at that point is to transfer additional quota from other vessels and where it is unable to do so the vessel must stop fishing.

References:	
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Non-Conformance:	None <input checked="" type="checkbox"/>		
Summary Evidence:	All transfers of quota must be authorised by the Fisheries Directorate and does not come into effect until they have confirmed it. Information on the catch quota, including quota transfers, of each vessel or vessel group, is recorded in the Fisheries Directorate’s official central database.		
Evidence:	Application forms for the transfer of quota, including between vessels, are available online (<i>in Icelandic</i>) at: http://www.fiskistofa.is/eydublod/flutningurveidiheimilda/		
	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 ¹⁴⁴ 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 footnotes.		
Non-Conformance Number (if relevant)	NA		

142 <http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/thorskigildisstudlar/>

143 http://www.fiskistofa.is/fiskveidistjorn/stjornfiskveida/#Sveigjanleiki_i_aflamarkerfinu

144 <http://www.fiskistofa.is/eydublod/flutningurveidiheimilda/>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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 ¹⁴⁵ . For each vessel the information available for each species is: <ol style="list-style-type: none"> 1. Allocated quota (initial allocation of quota from the overall TAC based on no. of shares) 2. Compensations (quota gained/lost through compensations) 3. Quota transferred from the previous year (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 <p>For illustrative purposes Table 14 in the supporting evidence for Clause 2.3.1.3 shows the first 10 lines of the publicly available data on individual vessels' quota allocations of ISS herring in the 2016/2017 fishing season.</p>			
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence: There is a clearly established legal framework which sets out rules and regulations relating to fishing activity within Icelandic waters and the penalties for violation of these rules. It gives powers to the Ministry, the Fisheries Directorate, the Coast Guard and the MFRI to monitor fishing activities and enforce these rules. Penalties exist for serious infractions. This largely comprises administrative penalties ranging from guidance letters and reprimands to suspension of fishing permits and weighing licenses. More serious cases are sent to the police for prosecution under the criminal system which can result in imprisonment.			
Evidence: There is a clearly established legal framework which sets out rules and regulations relating to fishing activity within Icelandic waters and gives powers to the Ministry, the Fisheries Directorate, the Coast Guard and the MFRI to monitor fishing activities and enforce these rules. Penalties for violation of the laws and regulations are described in clause 2.1.1 and range from the issue of reprimands to 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 ⁸⁰ ; Articles 15-17 of Act No. 79/1997 ⁸⁴ ; Chapter 4 of Act no. 57/1996 ⁸²). 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			

¹⁴⁵ <http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/aflastodulisti.jsp?lang=en>

inspection duties reside with the Coast Guard. In addition, the MFRI also has the legal power to enact temporary spatial closures. A breakdown of inspection activities in 2017 with comparison with previous years was provided to the assessment team by the Coast Guard and is summarised in clause 2.1.1, alongside details of 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 41 below). In 2017, the most significant numbers of infringements related to manning lists (lögskráningar) and seaworthiness (Haffæri). Only one infringement relating to fishing (Veiðar) was recorded in 2017. Foreign vessels are also inspected – both in the Icelandic EEZ and further afield as part of Iceland’s contribution to monitoring and surveillance as a member of NEAFC. In 2017, 18 foreign vessels were inspected which, in relation to fishing activities in the Icelandic EEZ, led to remarks to 2 Norwegian capelin fishing vessels due to gear infringements and to a Faroe Islands handline/jigger vessel for logbook infringement.

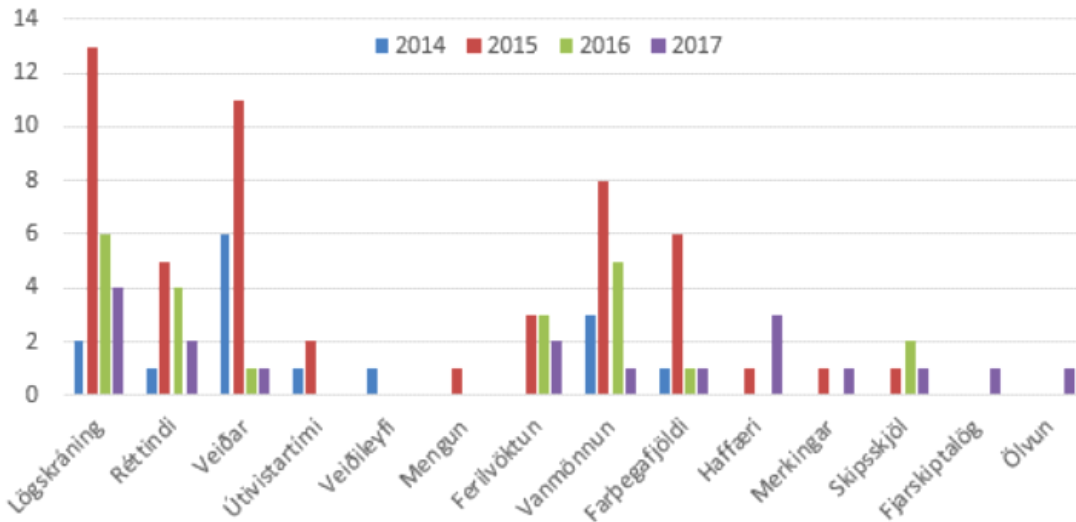


Figure 41. Reasons for the generation of remarks, by no. of remarks generated, during Coast Guard inspections in 2014-2017; Lögskráningar – Manning list, Réttindi – License, Veiðar – Fishing, Útivistartími – time limits for fishing, Veiðileyfi – Fishing permit, Mengun – Pollution, Ferilvöktun – VMS, Vanmönnum – Manning, Farþegafjöldi – Passengers, Haffæri – Sea worthiness, Merkingar – Marking, Skipsskjöl – Ship’s papers, Fjarskiptalög – telecommunications, Ölvun - intoxication (Source: Icelandic Coast Guard).

In their annual report, the Fisheries Directorate publish a comprehensive summary of suspected offenses recorded during maritime surveillance and the enforcement action subsequently taken (tables below). A comparison of some of the enforcement action taken in recent years is shown in. 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 (1201 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 were 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 17. Overview of suspected offenses recorded (Source Fiskistofa Annual Reports 2017¹⁴⁶ and 2016¹⁴⁷).

Offenses recorded by Fiskistofa	2017	2016
Violation of landing rules (broken down into:)	52	60
• <i>Not landing fish at official landing location</i>	5	4
• <i>Weighing container</i>	10	13
• <i>Misreporting (Landing full size fish as part of catches of juveniles)</i>	9	22
• <i>Incorrect specification of species</i>	11	4
• <i>Other</i>	17	17
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
• <i>Not submitting logbooks on time</i>	674	657
• <i>Other</i>	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 18. 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

146 Fiskistofa 2017 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/medferd_mala_og_urskurdir.pdf147 Fiskistofa 2016 Annual Report, Chapter 8. http://www.fiskistofa.is/media/arsskyrslur/kafi8_2016.pdf

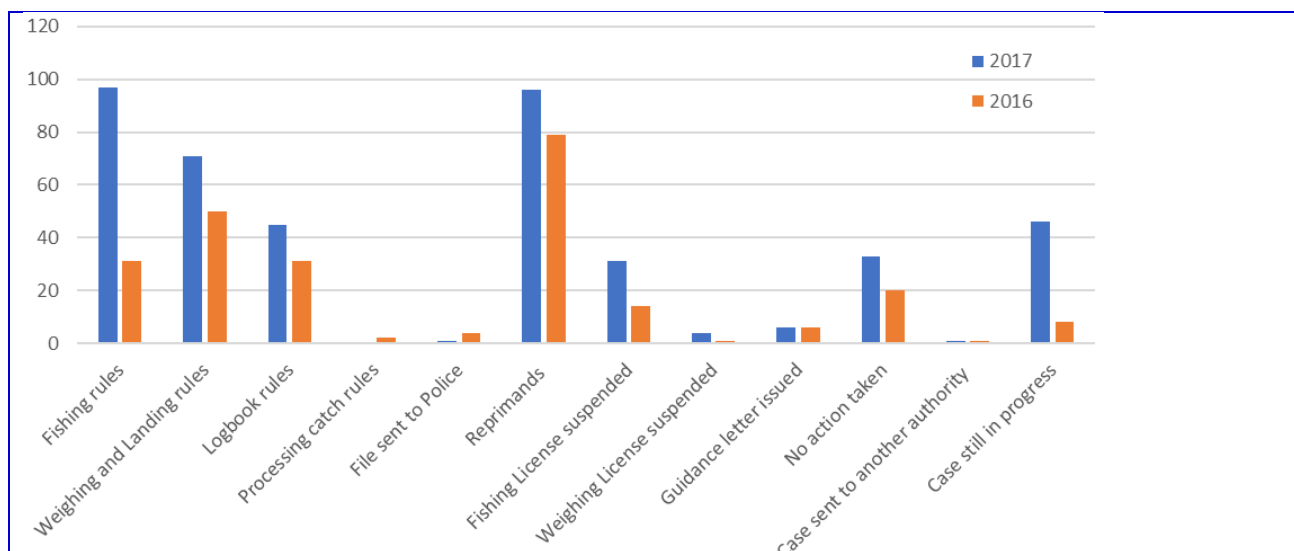


Figure 42. Comparison of some of the main areas of enforcement action taken by the Fisheries Directorate in recent years. The first four columns show the violation and the remaining columns show the enforcement action subsequently taken (Source: SAIG, based on Fiskistofa Annual Report 2017 and 2016).

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

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. The ITQ system has rules and flexibilities to allow for corrective management measures and adjustments to be incorporated. Consequently, deviations may be attributable to the legitimate inter-species, inter-vessel or inter-annual quota transfers which are subject to certain limits (as described in clause 2.1.1), but in any case, where there are deviations analysis is carried out to determine the root cause of these.

As can be seen from the supporting evidence for clause 2.2.1, since the beginning of the time series actual catches of ISS herring have fluctuated around parity with the TAC, with TACs being overshoot in some years and undershot in others. There is no clear pattern of catches consistently exceeding TACs. As noted above, catch balancing mechanisms exist and contribute to TAC overshoots in some years. For example, a 14% TAC overshoot in 2014/2015 resulted, at least in part, from a 17% TAC undershoot in 2013/2014 and the subsequent transfer of a positive quota balance from 2013/2014 to 2014/2015. Over time these inter-annual transfers should balance themselves out and an examination of the last 20 fishing seasons show that, while there have been both over and undershoots in that time, total catches across the period are within 0.1% of total TACs. Some relevant adjustments in quota for herring for the 2017-2018 fishing year are shown in the table below.

Table 19. Fishing period Sept 2017-Aug 2018, quotas, balances and transfer information for ISS herring (Source: Fisheries Directorate website, total catch and quota status¹⁴⁸).

Species	Atlantic herring	Capelin	Lobster	Outshore shrimp
Alloc. quota	31,660	175,741	335	4,735
Compensations	2,052	10,549	19	265
Trfr. prev. year	5,662	0	113	1,015
Allowed catch	39,374	186,290	467	6,015
Catch	35,988	186,290	250	3,519
Balance	3,386	0	217	2,496
Transfers	0	0	0	0
New balance	3,386	0	217	2,496
Trfr/ next year	3,386	0	217	658
Over fished	0	0	0	0
Net quota status	0	0	0	1,838

In the Table above the 39,000 t TAC is the sum of the first three lines of allocated quota, compensations and transfers from previous year. There is a balance of 3,386 t in the catch as the TAC was not fully utilised and creates a transferable quota to next season.

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:	<p>All processors purchasing fish, be it directly or at auction, are obliged to submit monthly reports to the Directorate. In addition, the fish auction reports all sales of fish directly to the Directorate. Analysis of catches includes the comparison of reported catches with the amount of sold or exported products to verify independently that landings aligned accurately with those reported. If comparison reveals discrepancies in reported and actual landings received from quayside weighing by registered weighers corrective action is taken as appropriate.</p>		
Evidence:	<p>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.</p> <p>Export documentation provides an independent comparative check on catch quantities for different species. Analysis of catches includes the comparison of reported catches with the amount of sold or exported products to verify independently that 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.</p>		
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

¹⁴⁸<http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/?skipnr=0&timabil=1718&fyrirspurn=UmSkip&landhelgi=i>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Where required, full traceability from catch, through processing, export and delivery on the market is possible.			
Evidence:			
<p>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.</p> <p>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.</p> <p>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.</p>			
References:	See footnotes.		
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 addressed¹⁴⁹, consistent with the precautionary approach¹⁵⁰.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
<p>Summary Evidence: Adverse impacts of the fishery on the ecosystem are considered, appropriately assessed and effectively addressed, consistent with the precautionary approach.</p> <p>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 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 and spurdog, unless they are caught alive in which case they must be released. The fishery has been dominated by pelagic trawls in recent years, but both purse seine and pelagic trawls are considered ‘clean’ fisheries with relatively little bycatch. The main species that may be caught with ISS herring are blue whiting, capelin, mackerel and AS herring. All of these species are above their biological limit points and with the exception of AS herring are above MSY $B_{trigger}$, where this is defined. Understanding of the by-catch of non-commercial species and marine mammals and seabirds is poor as there hasn’t been systematic recording and some concerns have been raised about the reliability of the logbook and inspector records but measures have been put in place to improve recording and 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). Interactions with vulnerable species and seabed VMEs are considered limited due to the use of pelagic gears in the fishery. Interactions with ETP and marine mammals and seabirds are considered low. Killer whale are associated with herring which is an important prey item for them but available evidence from inspectors and logbooks indicates there is little by-catch.</p> <p>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 v2.0. Further evidence of reliable data collection from the improved inspector programme and electronic logbook reporting system would increase confidence that there are no adverse impacts on vulnerable species, marine mammals and seabirds.</p> <p>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 Institute¹⁵¹. The MFRI’s main research priorities are:</p> <ul style="list-style-type: none"> • Research on marine and freshwater ecosystems • Sustainable exploitation of fish stocks • Ecosystem approach to fisheries management • Research on fishing technology • Seafloor and habitat mapping 			

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

150 In this context refer to 2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries, Article 3I: 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. ...

151 <https://www.hafogvatn.is/en/about/mfri>

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 Iceland¹⁵².

Key ecosystem and environmental signals in Icelandic waters in 2018¹⁵³

- 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.
- 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.

152 http://www.hafro.is/Astand/2015/umhverfi_2015.pdf

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

- 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 most of the exploited fish stocks in Iceland are in the Atlantic water 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 northern and the eastern areas. 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 to different degrees. 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 averages¹⁵⁴.

Discards

Since 1996 discarding is prohibited and subject to penalty¹⁵⁵. 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.

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 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 inspectors¹⁵⁶.

154 http://www.hafro.is/Astand/2015/umhverfi_2015.pdf

155 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>

156 Document extract provided by MRFI "Chapter 2. Sampling by the Marine Research Institute and others." Dated January 5, 2012.

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 inspector 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 inspector coverage varies, it is 1-2% on average (see table 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 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 20. 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 ISS herring in the 2017/2018 season totalled approx. 35,000 t; of this 100% was taken by pelagic trawls¹⁵⁷. Vessels switch between gears based on the spatial distribution of herring, in years where herring are highly aggregated they are targeted primarily with purses seines and when they are dispersed over a wider area in offshore waters they are targeted primarily with pelagic trawls. Vessel involved in Icelandic pelagic fisheries use suites of advanced electronics to identify the species composition of target shoals before they deploy their fishing gear. As a consequence of the highly targeted nature of the herring fishery, yields are generally extremely homogenous, comprising high proportions of the target species.

Purse seine fisheries for ISS herring have historically taken place mainly in coastal waters to the east and west of Iceland and are recognised as clean fisheries that target dense aggregations of herring. As such, there is very little mixing with any other stocks, herring or otherwise, and purse seine catches are considered to have negligible impacts on non-target species.

Pelagic trawls are the preferred method in offshore waters where they are used to target overwintering aggregations of herring. There are regulations in place that prevent the use of pelagic trawls within 12nm of the coast with some exceptions in certain areas (Article 2, Regulation on hunting of Icelandic summer spawning herring No. 770/2006 as amended¹⁵⁸, also Act No. 79/1997¹⁵⁹). This is aimed at limiting bycatch of juveniles of other fish species). In recent years, there has been a change in distribution of herring so that most of the stock overwinters in offshore waters to the west of Iceland and this explains the dominance of the pelagic trawl in the fishery since 2014/2015. This change is not considered to affect the selectivity of the fishery because the fishery is still targeting dense schools of overwintering herring¹⁶⁰ and the catches in these fisheries tend to be quite homogenous, containing almost exclusively ISS herring. However, a significant minority of ISS herring catches are also made in offshore mixed pelagic fisheries directed at mixed shoals of AS herring, ISS herring and mackerel and herring are also sometimes caught in small volumes in conjunction with blue whiting and capelin. For example, in 2017/2018 the directed fishery accounted for 63% of the total catches with the remaining 37% of the catch taken as by-catch in the fishery for AS herring and mackerel during June to October and mainly southeast and east of Iceland.

As a result of their being caught in conjunction with ISS herring these 4 stocks (ordered by total Icelandic catches in 2017-2018; blue whiting, capelin, mackerel and AS herring) constitute the major bycatch species in the ISS herring fisheries; further information on the status of these stocks is presented below and the spatial distribution of catches of these species is presented in Figure 43. Note: Pelagic trawls also occasionally capture small volumes of demersal

157 ICES (2018). Advice on fishing opportunities, catch, and effort. Herring (*Clupea harengus*) in Division 5.a, summer-spawning herring (Iceland grounds). Published 13 June 2018: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/her.27.5a.pdf>

158 Regulation on hunting of Icelandic summer spawning herring No. 770/2006. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553>

159 Act on fishing in Iceland's exclusive fishing zone No. 79/1997. <https://www.althingi.is/lagas/nuna/1997079.html>

160 ICES (2018). Report of the North Western Working Group (NWWG) 26 April-3 May 2018. ICES Advisory Committee ICES CM 2018/ACOM:09: <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/NWWG/01%20NWWG%20Report%202018.pdf>

species such as cod, saithe and redfish; however, these catches are generally insignificant in relation to overall catches of these species.

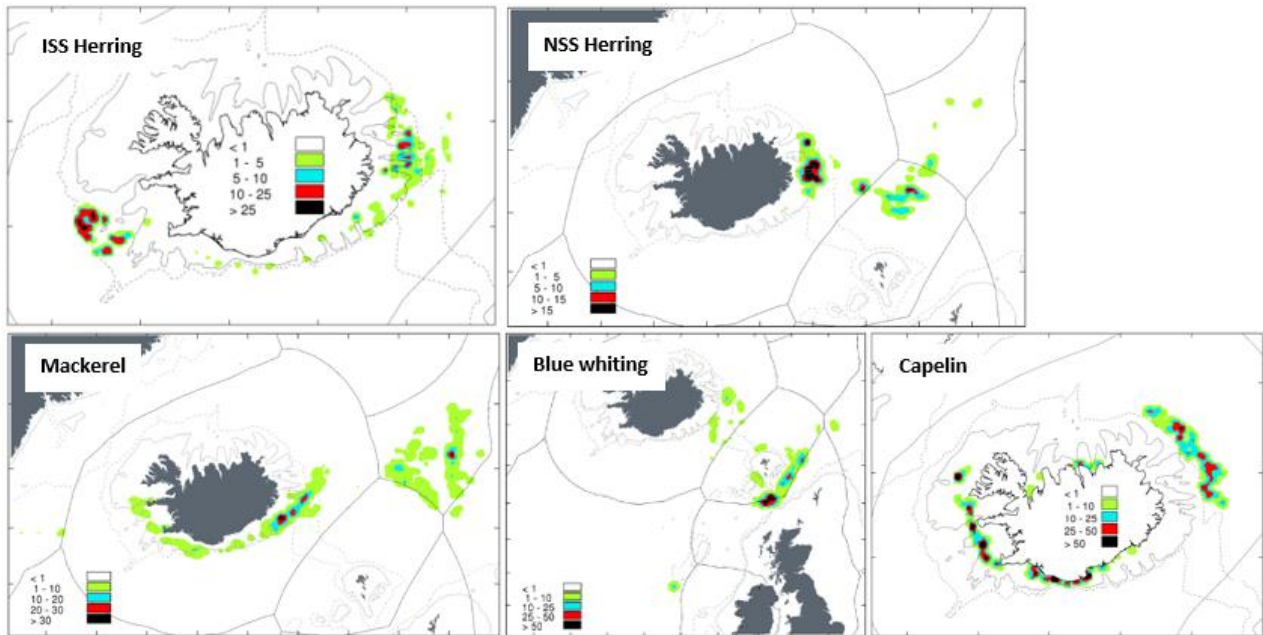


Figure 43. Fishing grounds and effort (t/nmi²) of Icelandic fishing fleet on retained species in 2017 (Source: MFRI harvesting advice 2018^{161, 162, 163, 164, 165}).

Blue whiting (*Micromesistius poutassou*) – Kolmunni

An annual international blue whiting survey has been carried out by Norway, Russia, the Faroe Islands and the EU since 2004 on the spawning grounds west of the British Isles in March-April. There is no agreement between participating nations on quota allocations which has resulted in catches exceeding ICES advice.

Total catches of blue whiting by all nations in 2017 were 1,558,061t, well in excess of the advised TAC for the year of 1,342,330t. Icelandic landings in 2017 were around 228,935t with the bulk of the catches, around 195,000t, being taken in Faroese waters while 11% was taken in Icelandic waters which is similar to the distribution of Icelandic fishing effort in recent years from 2006. The distribution of blue whiting in recent years means the likelihood of encountering them in the ISS herring fisheries is extremely limited (Figure 43)¹⁶⁶.

Spawning-stock biomass has decreased since 2017 but remains well above MSY $B_{trigger}$, B_{pa} and B_{lim} . Fishing mortality has increased from a historical low in 2011 to above F_{MSY} since 2014. F_{2018} (0.45) remains above F_{msy} (0.32) but is below F_{lim} (0.88) and F_{pa} (0.53). Recruitment in 2017 and 2018 are estimated to be below the long-term average, after seven years of above average recruitment (Figure 44). ICES advises that when the long term management strategy agreed by the EU, the Faroe Islands, Iceland and Norway is applied, catches in 2019 should be no more than 1,143,629 t¹⁶⁷.

161 https://www.hafogvatn.is/static/extras/images/Sild_2018729472.pdf
 162 <https://www.hafogvatn.is/static/extras/images/Sild-ni20181101126.pdf>
 163 <https://www.hafogvatn.is/static/extras/images/Makrill1097054.pdf>
 164 <https://www.hafogvatn.is/static/extras/images/Kolmunni1097056.pdf>
 165 <https://www.hafogvatn.is/static/extras/images/LodnaHaust20181100274.pdf>
 166 <https://www.hafogvatn.is/static/extras/images/Kolmunni1097056.pdf>

167 ICES (2018). Advice on fishing opportunities, catch, and effort. Blue whiting (*Micromesistius poutassou*) in subareas 1–9, 12, and 14 (Northeast Atlantic and adjacent waters): <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/whb.27.1-91214.pdf>

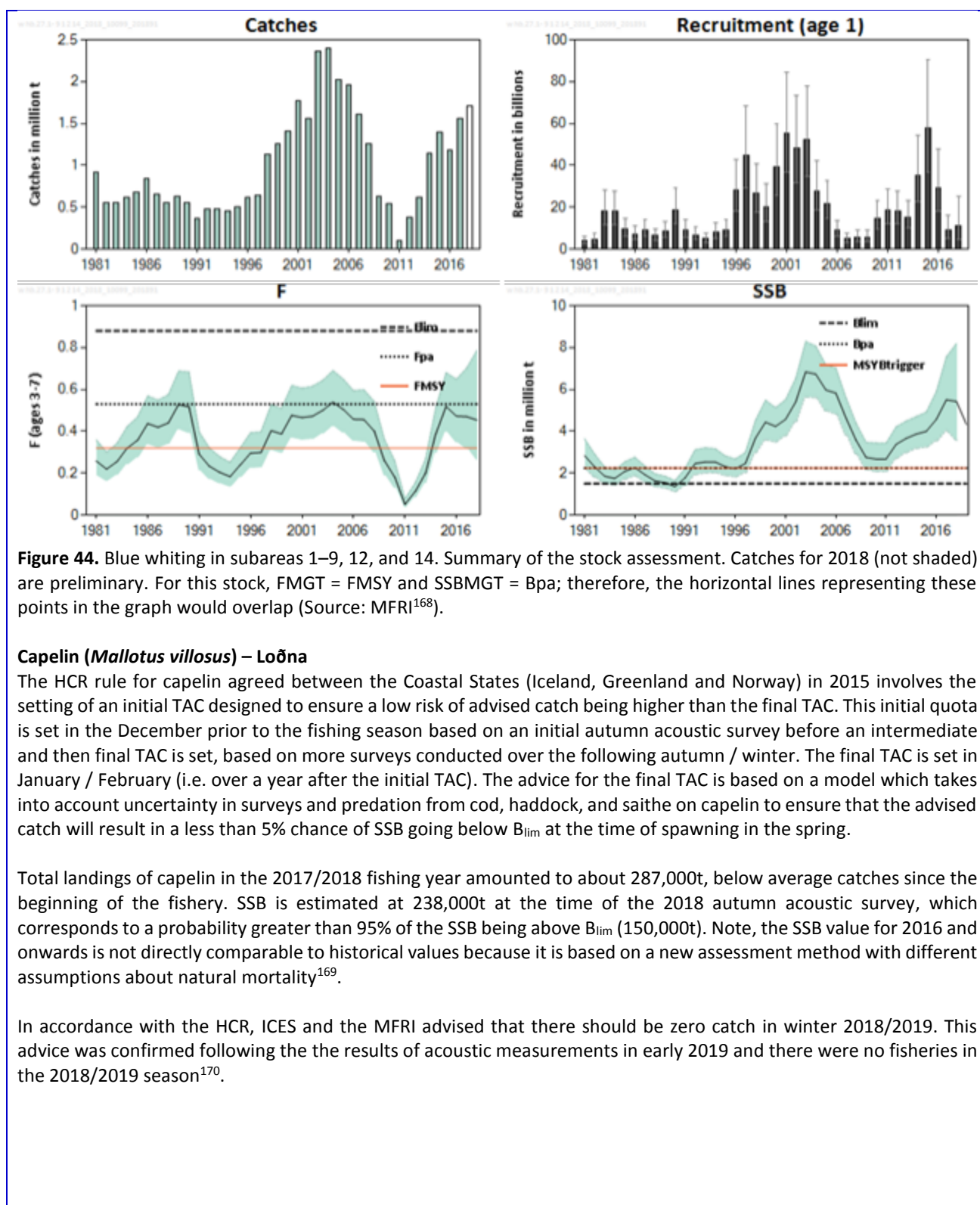


Figure 44. Blue whiting in subareas 1–9, 12, and 14. Summary of the stock assessment. Catches for 2018 (not shaded) are preliminary. For this stock, FMGT = FMSY and SSBMGT = Bpa; therefore, the horizontal lines representing these points in the graph would overlap (Source: MFRI¹⁶⁸).

Capelin (*Mallotus villosus*) – Loðna

The HCR rule for capelin agreed between the Coastal States (Iceland, Greenland and Norway) in 2015 involves the setting of an initial TAC designed to ensure a low risk of advised catch being higher than the final TAC. This initial quota is set in the December prior to the fishing season based on an initial autumn acoustic survey before an intermediate and then final TAC is set, based on more surveys conducted over the following autumn / winter. The final TAC is set in January / February (i.e. over a year after the initial TAC). The advice for the final TAC is based on a model which takes into account uncertainty in surveys and predation from cod, haddock, and saithe on capelin to ensure that the advised catch will result in a less than 5% chance of SSB going below B_{lim} at the time of spawning in the spring.

Total landings of capelin in the 2017/2018 fishing year amounted to about 287,000t, below average catches since the beginning of the fishery. SSB is estimated at 238,000t at the time of the 2018 autumn acoustic survey, which corresponds to a probability greater than 95% of the SSB being above B_{lim} (150,000t). Note, the SSB value for 2016 and onwards is not directly comparable to historical values because it is based on a new assessment method with different assumptions about natural mortality¹⁶⁹.

In accordance with the HCR, ICES and the MFRI advised that there should be zero catch in winter 2018/2019. This advice was confirmed following the the results of acoustic measurements in early 2019 and there were no fisheries in the 2018/2019 season¹⁷⁰.

168 ICES (2018). Advice on fishing opportunities, catch, and effort. Blue whiting (*Micromesistius poutassou*) in subareas 1–9, 12, and 14 (Northeast Atlantic and adjacent waters). Published 28 September 2018: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/whb.27.1-91214.pdf>

169 ICES (2018). ICES advice on fishing opportunities, catch, and effort. Capelin (*Mallotus villosus*) in subareas 5 and 14 and Division 2.a west of 5°W (Iceland and Faroes grounds, East Greenland, Jan Mayen area). Published 30 November 2018: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cap.27.2a514.pdf>

170 ICES (2019). North West Waters Working Group. http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2019/NWWG/14%20NWWG%20Report%202019_Sec%2012_Capeline%20in%20the%20Iceland-East%20Greenland-Jan%20Mayen%20area.pdf

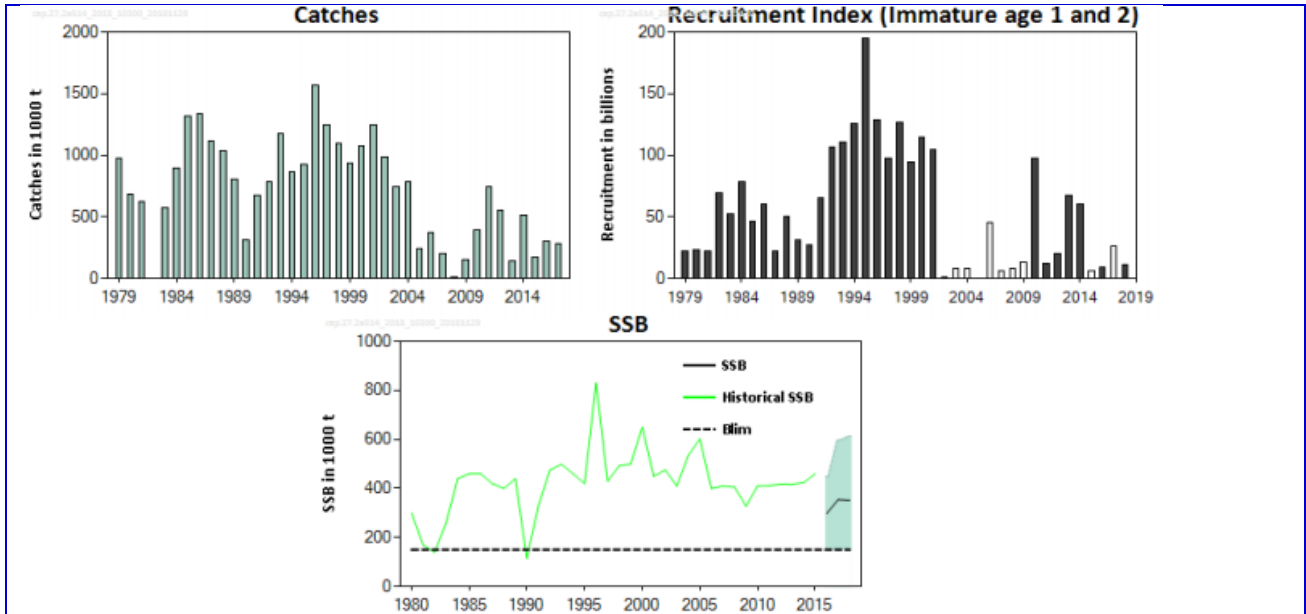


Figure 45. Capelin in subareas 5 and 14 and Division 2.a west of 5°W. Summary of the stock assessment. Catches (thousand t) by fishing season (July–March of the following year). Recruitment (immature-at-age 1 and 2; numbers in billions) as acoustic index from autumn surveys (unshaded bars indicate incomplete spatial coverage likely resulting in notable underestimation), and SSB (thousand t, with 90% confidence intervals for the last two years) at spawning time (March–April). Note that the SSB values for 2016 and onwards are not directly comparable to historical values because they are based on different assumptions about natural mortality (Source: ICES, 2018¹⁷¹).

Mackerel (*Scomber scombrus*) – Makrill

Mackerel are a relatively recent arrival to the Icelandic EEZ. Since 2006, mackerel have expanded their range to the north and west beyond areas in which they have historically been distributed and have migrated to an increasingly greater extent into Icelandic waters. The reasons for this change are not well known, but have been linked to increased stock size, changes in the ocean climate, and prey abundance. In recent years MFRI has participated in international surveys and data collection efforts with resulting data being used by ICES in their assessment of the stock. The annual international research trawl undertaken in summer 2018 found the abundance of mackerel in Icelandic waters was lower in 2018 than in the six years before. The reasons for the sudden decline in mackerel migration into the Icelandic exclusive economic zone are poorly known.

There is no agreement between the coastal states on quota allocation, which has resulted in catches far exceeding ICES advice. For example, total catches of mackerel by all nations in 2017 were approx. 1,156,000 t, well in excess of the advised TAC for the year of ≤ 857,185 t. Icelandic landings of mackerel in 2017 were around 167,000 t with 63% coming from Icelandic waters, 35% from international, 1% from Greenlandic and <1% from Faroese waters.

In their September 2018 advice, ICES and MFRI, estimate stock biomass to have increased since the late 2000s to reach a maximum in 2011 and has been declining since then. The stock is estimated to be below MSY $B_{trigger}$ in 2018, for the first time since 2007. Fishing mortality has been declining from high levels in the mid-2000s but increased again after 2012 and remains above F_{MSY} . There has been a succession of large year classes since the early 2000s but the 2015 and 2016 year classes are estimated to be below average (Figure 46). ICES advises that when the MSY approach is applied, catches in 2019 should be no more than 318,403 t^{172, 173, 174}.

171 ICES (2018). ICES advice on fishing opportunities, catch, and effort. Capelin (*Mallotus villosus*) in subareas 5 and 14 and Division 2.a west of 5°W (Iceland and Faroese grounds, East Greenland, Jan Mayen area). Published 30 November 2018:

<http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cap.27.2a514.pdf>

172 MFRI Advice on mackerel. 29 September 2017: <https://www.hafogvatn.is/static/extras/images/Makrill275.pdf>

173 MFRI Advice on mackerel. 28 September, 2018: <https://www.hafogvatn.is/static/extras/images/Makrill1097054.pdf>

174 ICES 2018. ICES advice on fishing opportunities, catch, and effort. Ecoregions in the Northeast Atlantic and Arctic Ocean. Mackerel (*Scomber scombrus*) in subareas 1–8 and 14, and in Division 9.a (the Northeast Atlantic and adjacent waters). Published 28 September 2018, version 3: 25 October 2018: <http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/mac.27.nea.pdf>

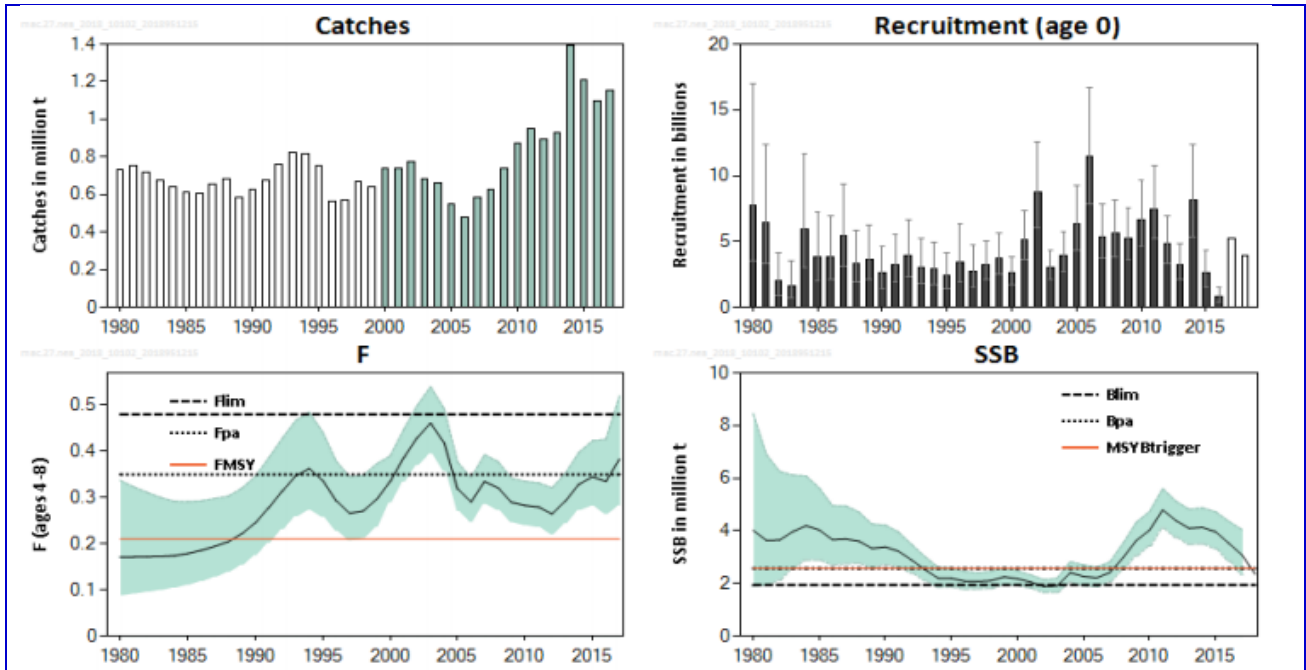


Figure 46. Mackerel in subareas 1–8 and 14, and in Division 9.a. The unshaded catches prior to 2000 are the years that have been down-weighted in the assessment because of the considerable underreporting that is suspected to have taken place. The recruitment value for 2017 is the time-tapered weighted mean of the recruitments from 1990 to 2016 as estimated by the SAM model, and the recruitment value for 2018 is the geometric mean of the recruitments from 1990 to 2016. Confidence intervals (95%) are included in the recruitment, fishing mortality, and spawning-stock biomass plots (Source: ICES, 2018¹⁷⁵).

In their advice, ICES note that some of the data series upon which the assessment is based are still short (IESSNS: 8 years, new RFID tagging data: 6 years of recapture). The inclusion of additional years of data for these short time-series may modify the relative weight of the different data sources in the assessment and therefore cause a revision in the level of the SSB and F for the recent period. The RFID tagging data appear to be the most influential data source so that leaving out the tagging data from the assessment or making other assumptions about how these data are used in the assessment, changes the assessment estimates of stock size considerably. A closer investigation of how the model ascribes weights to each data source is required.

Accordingly, ICES Northeast Atlantic mackerel inter-benchmark workshops were held on 11-13 December 2018 and 4-7 March 2019 with a specific focus on the influence of the tagging data on the assessment, since at the 2018 working group meeting (WGWIDE) sensitivity analyses showed a substantial change in perception of the mackerel stock when tagging data was excluded from the assessment. This indicates a high, and potentially incorrectly specified, weight of this data source. The group also looked at a revised recruitment index and at the quality of the catch sampling. After thorough review of the data and analyses the group made a number of decisions with regard to the data that should be included in the assessment model and the statistical approach to model these data.

In relation to estimated stock trends and the absolute estimate of biomass by the assessment model, the group found there is a large change in the perception of the stock trajectory for the period after 2010. The lower influence of the RFID data (formerly pulling the updated assessment down), combined with the fact that the remaining RFID data no longer indicates a decline in the stock, leads to an SSB that is increasing between 2012 and 2015 and declining afterward to just under 4 million t. Whereas, the updated assessment from WGWIDE 2018 gave an SSB that is declining since 2011, to just above 2 million t in 2018. The trend in fishing mortality in the WGWIDE 2018 updated assessment shows an increase from 2011 to 2017, while in the assessment using the subset of the RFID, fishing mortality is rather stable over this recent period (Figure 47).

Consequently, the WG had concerns that the decline in stock trend since 2011 had been overestimated and total biomass underestimated given that fisheries independent indices of abundance (e.g. egg survey, swept-area survey, tagging data), when taken as indicators of absolute biomass, would suggest a higher density of mackerel. The inter-benchmark concluded that the previously noted decline since 2010 has shifted to a decline since 2014 (ICES, 2019)¹⁷⁶.

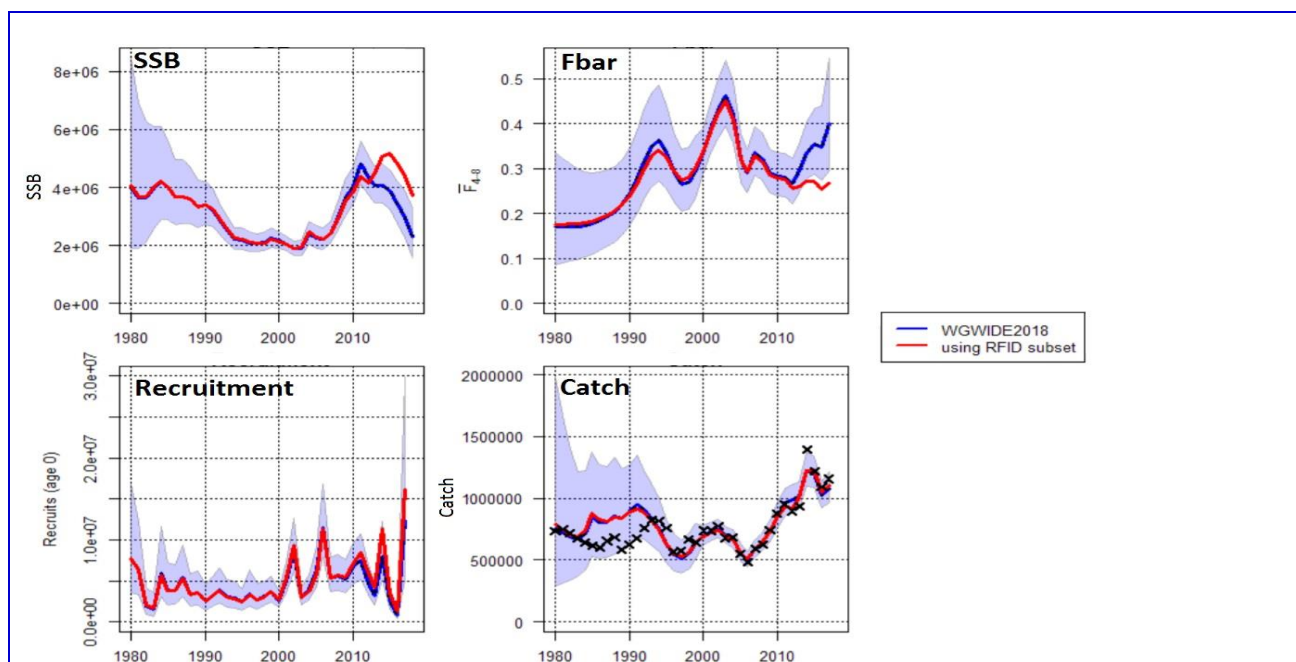


Figure 47. Summary of the ICES WG WIDE 2018 assessment and of the assessment run on the subset of the RFID data (Source: ICES, 2019¹⁷⁹).

Norwegian Spring-spawning/Atlanto-Scandian herring (*Clupea Harengus*) – Norsk-Íslensk Vorgottssild

NSS herring is managed under a long-term management strategy (LTMS) agreed in 2018 between the EU, Faroes, Iceland, Norway and Russia. The LTMS sets out to ensure with high probability that the size of the stock is maintained above a B_{lim} of 2.5 million t and revises the trigger biomass to 3.184 million t. The LTMS sets out a Harvest Control Rule (HCR) which reduces F between these reference points and below B_{lim} ¹⁷⁷. ICES evaluated the LTMS and found the proposed HCR to be consistent with the precautionary approach. In addition, the HCR remains precautionary when constraints on interannual TAC change are added (-20%/+25%) and is also robust to 10% banking or borrowing of quota between years¹⁷⁸. Since 2013, there has been a lack of agreement between the coastal states on quota sharing which has led to setting of unilateral quotas. Due to these unilateral quotas total catches have been between 10% and 21% higher than advised. Further, the stock size has declined because of relatively poor recruitment since 2005.

Total catches of NSS herring by all nations in 2017 were approx. 722,000 t, higher than the advised TAC for the year of $\leq 437,364$ t. Icelandic landings of NSS herring in 2017 were 90,400 t, 62% of the catches were taken in Icelandic waters, 32% within Faroese waters and around 6% in international waters.

The NSS herring stock has been declining in recent years but is estimated to be above $MSY B_{trigger}$ in 2018. Four large year classes have been produced since 1998 (1998, 1999, 2002, and 2004), estimated recruitment was average or low in the 2005 to 2015 year classes, however, the 2016 year class is estimated to be above average. Fishing mortality has been increasing since 2015 and is above F_{MSY} in 2017 (figure below). Estimated SSB_{2019} (3.859 million t) is above $MSY B_{trigger}$ (3.184 million t) and well above B_{lim} (2,500,000 t). ICES advises that when the management plan is applied, catches in 2018 should be no more than 588,562 t^{179, 180}.

175 ICES 2018. ICES advice on fishing opportunities, catch, and effort. Ecoregions in the Northeast Atlantic and Arctic Ocean. Mackerel (*Scomber scombrus*) in subareas 1–8 and 14, and in Division 9.a (the Northeast Atlantic and adjacent waters). Published 28 September 2018, version 3: 25 October 2018: <http://ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/mac.27.nea.pdf>

176 ICES 2019. Interbenchmark Workshop on the assessment of northeast Atlantic mackerel (IBPNEAMac). ICES Scientific Reports. 1:5. 71 pp. <http://doi.org/10.17895/ices.pub.4985>

177 <https://www.pelagic-ac.org/media/pdf/2019%20CS%20agreement%20on%20ASH%20TAC%20and%20LTM%20plan.pdf>

178 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/Special_requests/nea.2018.17.pdf

179 MFRI advice on AS herring. 22 October 2018: <https://www.hafogvatn.is/static/extras/images/Sild-ni20181101126.pdf>

180 ICES 2018. ICES advice on fishing opportunities, catch, and effort. Herring (*Clupea harengus*) in subareas 1, 2, and 5, and in divisions 4.a and 14.a, Norwegian spring-spawning herring (the Northeast Atlantic and the Arctic Ocean). Published 22 October 2018, version 2 25 October 2018. <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/her.27.1-24a514a.pdf>

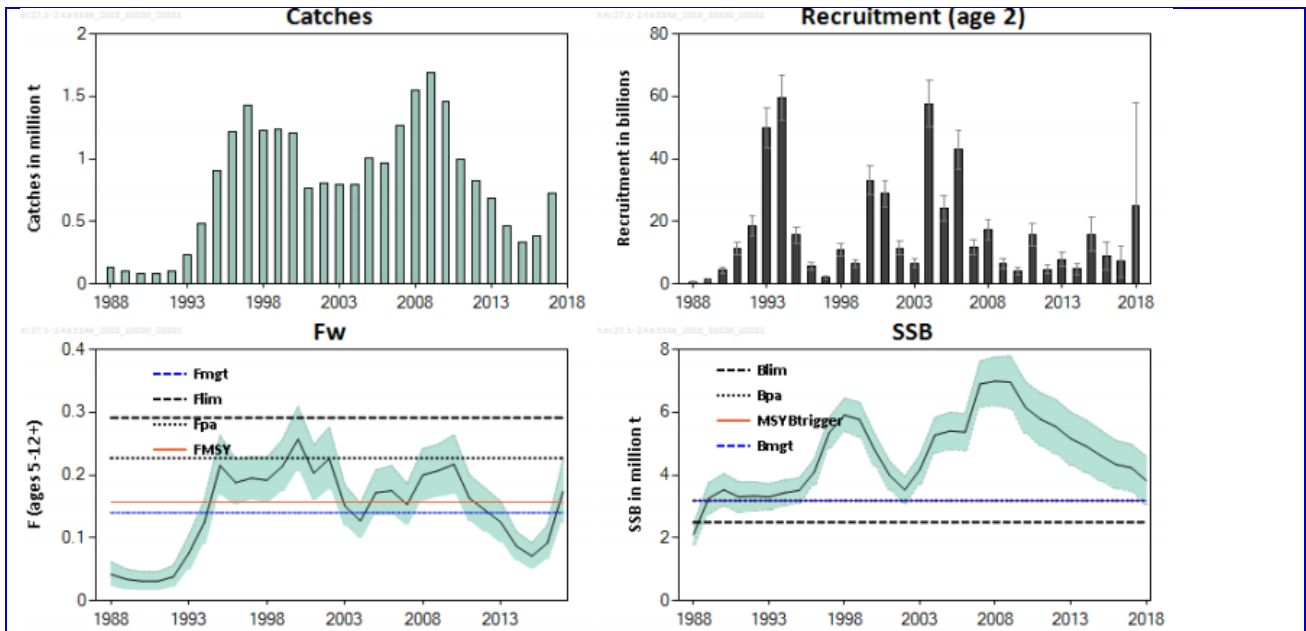


Figure 48. Herring in subareas 1, 2, and 5, and in divisions 4.a and 14.a (AS herring). Summary of the stock assessment. Confidence intervals (95%) are included in the recruitment, fishing mortality, and spawning-stock biomass plots. Fw is the fishing mortality weighted by the population numbers (Source: ICES 2018¹⁸³).

Vulnerable species Interactions

The discard prohibition only applies to commercially important species and protected species including Atlantic halibut (*Hippoglossus hippoglossus*)¹⁸¹ and porbeagle (*Lamna nasus*), basking shark (*Cetorhinus maximus*) and spurdog (*Squalus acanthias*)¹⁸² unless they are captured alive in which case they must be released and systematic recording of non-commercial by-catch has not occurred. Table 21 provides a summary of the fishery dependent and independent monitoring undertaken in Iceland. Until recently the programme has only covered commercial species and similarly the sampling by MRI, fishers and the MRV survey using a commercial vessel are focussed on commercial species. However, measures have been taken in recent years to extend the inspector programme to cover by-catch such as elasmobranchs (pers. comm. MFRI, site visit) and records for by-catch species including skate (*Dipturus batis*), Atlantic halibut, dogfish, Greenland shark (*Somniosus microcephalus*) and porbeagle (*Lamna nasus*) can be seen in the catch data available via the Directorate website (<http://www.fiskistofa.is/english/quotas-and-catches/>). These are seen to be either vulnerable or endangered, threatened or protected (ETP) species. However, these species are unlikely to interact significantly with the gears used in the ISS herring fishery and in the last year, there were no landings of these species reported in pelagic gears (June 2017 - June 2018).

Table 21. Sampling by the MFRI covering commercial catches and surveys (Source: Document 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

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 wolffish reduce fishing during the main spawning period of these species. Spawning areas of herring are not closed to fishing but there is no directed fishery for herring during their spawning season. However, other fisheries may impact these grounds for example the fishery targeting haddock which feed on herring eggs and are fished during herring spawning season (pers. com. MFRI, site visit).

Interactions of fishing gear with benthic ecosystems

Interactions between fishing gears and the seabed are highly dependent on gear type. Pelagic gears used in this fishery are not designed to be used in contact with the seafloor and considered unlikely to interact significantly with benthic ecosystems. The spatial distribution of fishing effort around Iceland is known, available data on fishing effort of the Icelandic fleet provided by satellite Vessel Monitoring Systems (VMS) are very accurate and have made it possible to map in detail the distribution of fishing effort.

Protection of Vulnerable Marine Ecosystems (VMEs)

It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; sponge communities, coldwater corals and hydrothermal vents), from significant adverse impact from bottom contacting 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. See below map indicating most of the current closures in Icelandic waters.

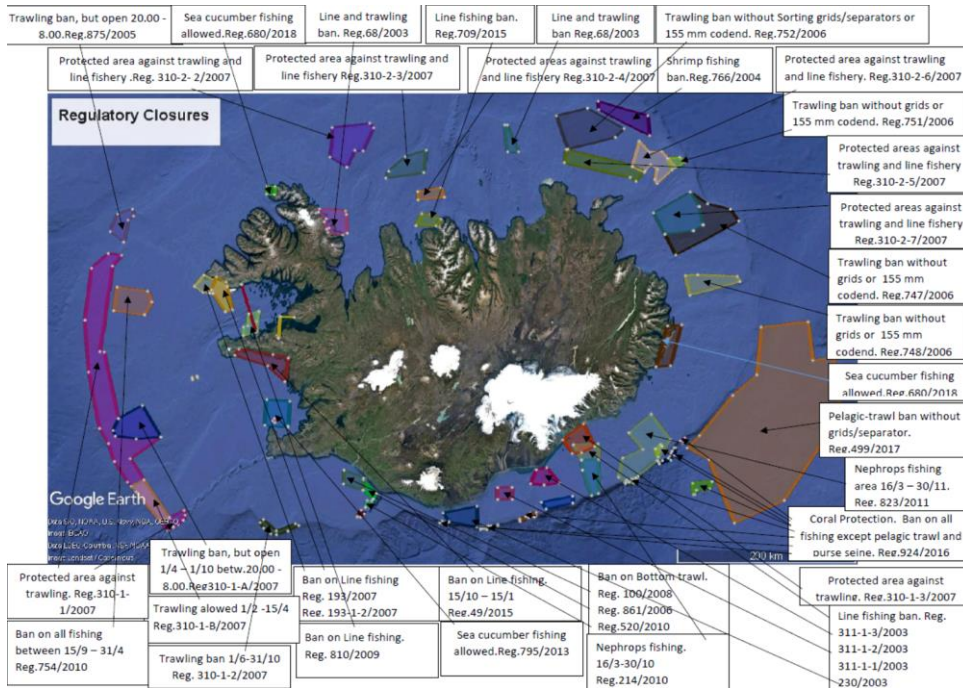


Figure 49. Regulatory Closures in Icelandic waters as of November 2018.

181 Regulation 470/2012. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302>

182 Regulation 456/2017. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017>

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). For example, during the summer of 2017 a 9-day habitat mapping cruise was conducted including a total 61 dives in four areas¹⁸³. 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. Further, MFRI is currently participating in the Norwegian Institute of Marine Research-led NovasArc project, together with the Faroe Marine Research Institute¹⁸⁴. 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 most recent meeting was in Tórshavn, Faroes on November 20-24, 2017. The key task for the workshop was to develop and test the analysis chain for the VME/impact analysis including:

- Making a habitat suitability model for one or two VMEs based on observations of occurrence and available abiotic setting e.g. temperature, substratum, current, topography.
- Produce a VME distribution map for the larger study area based on the habitat suitability model and environmental settings.
- Produce fishing pressure map based on trawling data for the larger area.
- Making impact estimates based on GIS analysis of overlap between the VME distribution and fishing intensity.

VMEs of particular importance within Icelandic waters are sponge and cold-water coral communities and hydrothermal vent areas and further information on these communities and habitats is provided below. Increasingly attention is also being given to sea-pen communities. As noted previously pelagic gears are thought to have minimal interaction with these seabed VMEs.

Sponge communities

Aggregation of large sponges (ostur or sponge grounds) is known to occur off Iceland (Klittgard and Tendal 2004). North of Iceland, particularly in the Denmark Strait, ostur was found at several locations at depths of 300-750 m, which some are classified as sponge grounds. Significant ostur and sponge grounds occur off south Iceland, especially around the Reykjanes Ridge¹⁸⁵.

Bycatch of sponges are recorded during bi-annual groundfish surveys allowing managers to estimate the distribution of mass sponge occurrences. Deep-sea sponges fall within the VME habitat category. Suggestions for conservation of deep-sea sponge aggregations by the MFRI will be based on research measurements. Likely areas will be mapped and evaluated prior to conservation suggestions (MFRI, Nov. 2018 site visits, pers. comm.). Currently, there are no strategic conservation plans in place for sponges; however, there are a number of different closures which while not designed specifically for the protection of sponge communities, provide *de facto* protection for benthic organisms including sponges. These include:

1. Closure of coastal areas within 4 – 12 nm to bottom trawls.
2. Several permanent regulatory fisheries closures outside of 12nm in which otter trawls, and in most cases long-lines, are banned
3. Cold water coral protection areas, some of which have considerable abundance of sponges

Sea-pen fields

In some locations with soft sediments sea pens can be found in high densities. Norway lobster *Nephrops norvegicus*, squat lobster *Munida sarsi* and sea cucumber *Stichopus tremulus* are commonly associated with them. Like sponges there are no strategic conservation plans in place for sea-pen communities; however, they derive *de facto* protection from other closures¹⁸⁶.

Cold water coral communities

The coral water coral closures protect *Lophelia pertusa*, a species of cold-water coral which is extremely slow growing, associated with diverse communities and may be harmed by destructive fishing practices. In 2004 a research project

183 <https://hafsbottinn.wordpress.com>

184 <http://novasarc.hafogvatn.is/>

185 <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2005/may/Iceland%20and%20East%20Greenland.pdf>

186 http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WGDEC/wgdec_2017.pdf

mapped coral areas off Iceland and as a result 10 areas to the southeast of Iceland were permanently closed to fishing (Figure 50).

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 inspectors. The MFRI are currently collaborating with Faroese and Norwegians to develop VMEs and indicators used to develop predictive models of VME distributions and overlap with fishing activities and bottom contacting gears using information from VMS swept area and electronic logbooks. This project is due to finish in late 2018 (pers .com. MFRI, site visit).

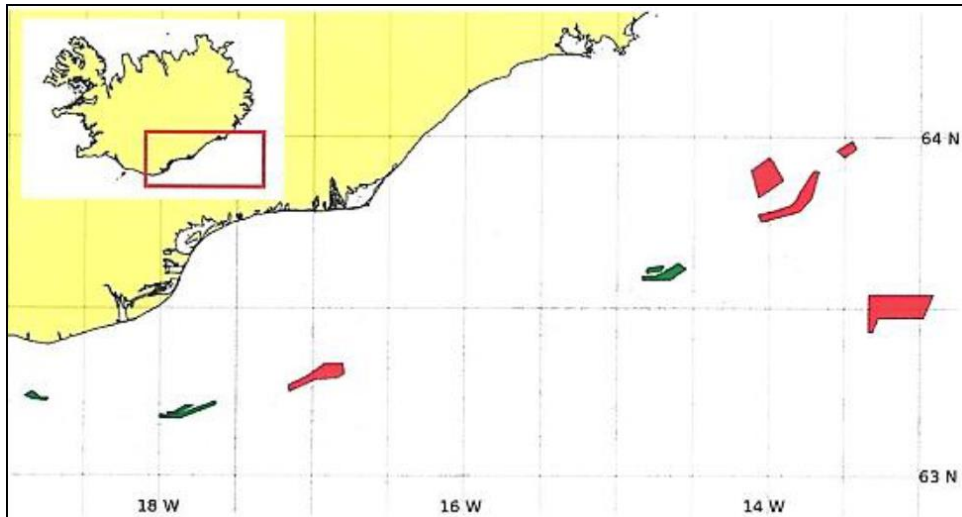


Figure 50. 10 coral closures in South East Iceland, current as of November 2018. Maps can be viewed by downloading Google Earth and clicking on the .kml file produced by the Directorate <http://uv.fiskistofa.is/uv.kml>

Hydrothermal vent areas

There are two known hydrothermal vent areas with series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyafjörður to the north of the island (Figure 51) and are fully protected by environmental law (No’s 249/2001 and 510/2007¹⁸⁷). There are additional known hydrothermal vents in deeper waters to north, south and southwest of Iceland. These are in more remote areas and have less surface structure and are not been considered threatened by fishing activities.



Figure 51. Coordinates and location of protected natural resources (i.e. hydrothermal vent) at Arnarnesstrýtur in Eyafjörður north of the Arnarnes river¹⁸⁸.

187 https://www.ust.is/library/Skrar/Einstaklingar/Fridlyst-svaedi/Auglysingar/Hverastrytur_evjafirdi_249_2001.pdf

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

Interactions with Seabirds and Marine Mammals

By-catch of marine mammals and seabirds in Icelandic waters has not been systematically investigated until very recently. Based on a study by Pálsson *et al.* (2015)¹⁸⁹, most of the marine mammal by-catch is expected to come from the gill net fisheries for cod and lumpfish close to the coast but there is the potential for smaller numbers of marine mammals to be caught in the pelagic trawls and purse seines targeting herring, capelin, mackerel and blue whiting¹⁹⁰.

Inspectors cover all gear types (as noted previously approximately 1% coverage in all fisheries) but the sampling is not focused on documenting marine mammal by-catch. Most attention is focussed on gillnet gear, where most of the by-catch is assumed and less information is available from pelagic fishing gears. It is important to note that even where inspectors are present they are not always in a position to document any by-catch. For instance, in the pelagic pair trawl fishery, inspectors are below deck to monitor the catch, and not in a position to see if a marine mammal is caught. Since 2014 this has improved with stricter guidelines regarding marine mammal by-catch and supervision of the inspectors. Prior to this the inspector data on marine mammal by-catch is not considered reliable.

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. In total there are 171 marine mammal and seabird species pre-programmed into the electronic logbook system that are selectable by fishers. 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 MRFI¹⁹¹ noted bycatch rates were 5 times higher when an inspector was present in 2014-2016, than when they were absent.

In its latest report to the North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on Bycatch, Iceland noted that there were no reports of by-catch from the pelagic trawl fleet, even with 'decent' inspector coverage and with 'very high' inspector coverage in the mid-water trawl fleet of 10 vessels. The working group requested more detail on the inspector effort to provide more confidence in this finding of no by-catch in the pelagic trawl fleet. They also noted 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 increasing¹⁹².

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 below).

189 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>

190 NAMMCO (2017). North Atlantic Marine Mammal Commission. Report of the 24th Scientific Committee meeting, 14-17 November 2017. <https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf>

191 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>

192 NAMMCO (2018). Report of the NAMMCO Scientific Working Group on By-catch <https://nammco.no/wp-content/uploads/2018/05/report-nammco-sc-bywgc-04042018.pdf>



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Borgartúni 35
105 Reykjavík

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 Thorarinnsson 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

ISS herring is important for killer whale (*Orcinus orca*) which in Iceland mainly prey upon herring and mackerel. There are on-going studies documenting this association (Sammara *et al.*, 2017a,b, cited in¹⁹³). Fishermen report that killer whale are generally not seen during trawling for ISS herring. They are frequently observed during the purse seine fishery but fishermen report that interactions with the gear are rare. Adult killer whales are generally able to make their own way out of the net but can cause significant damage if they are caught and need to be cut free. If it looks likely that a killer whale will be caught the gear is released to prevent damage to it (pers. com. site visit). In relation to understanding of their population and its status, the last review of killer whales in the North Atlantic dates from 1987. The NAMMCO Scientific Committee recommended in their last meeting that a review be undertaken of all available information and current research activities on abundance, stock structure, and movements of killer whales in the North Atlantic in readiness for their next meeting. Initial abundance estimates for Icelandic waters range from 4,000-6,847 killer whales but these estimates may include killer whales from several populations over large areas. A recent study identified a minimum of 314 individuals regularly using the waters off the southern and west coasts of Iceland (Tavares *et al.*, 2016 cited in¹⁹⁴) and the MFRI, through their long-term killer whale project, have published a catalogue containing over 400 killer whale individuals identified between 2006 and 2015 on their website in 2017: <https://www.hafogvatn.is/static/research/files/hv2017-005pdf>.

193 NAMMCO (2017). North Atlantic Marine Mammal Commission. Report of the 24th Scientific Committee meeting, 14-17 November 2017. <https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf>

194 NAMMCO <https://nammco.no/topics/killer-whale/#1475844082849-433d5060-e5a9>

Although evidence of the degree to which ISSH fisheries and marine mammals interact is sparse available evidence would indicate that, in Icelandic waters, direct mortality of marine mammals as a result of interactions with pelagic fishing gears used in the fishery is likely to be low and unlikely to have detrimental effects at the population level. Further evidence of reliable data collection from the improved inspector programme and electronic logbooks reporting system is required to improve confidence in this judgement.

Indirect effects including competition between fisheries and marine mammals and seabirds for stocks of forage species such as capelin, herring, mackerel etc. are likely to pose a greater treat to populations of marine mammals and seabirds than direct fishing related mortality. These potential ecosystem effects of the ISS herring fisheries are discussed in more detail in the supporting evidence for Clause 3.2.4. Foodweb Considerations.

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 ISS herring 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.

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.¹⁹⁵

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

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. Those 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 although there is thought to be limited interaction between pelagic gears used in this fishery and these benthic habitats.

Information on the interaction between non-commercial by-catch species, seabirds and mammals is poor as there hasn’t been systematic recording but measures have been put in place to improve recording and 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 mortality is unlikely to have population level effects. Further evidence of reliable data collection from the improved inspector programme and electronic logbooks reporting system would increase confidence in this judgement.

Evidence:

Retained species

The fishery targets dense shoals of herring so that catches tend to be homogeneous with little mixing with other stocks. With regards to retained catches, most commercially fished species in Iceland are now part of the ITQ system. Discarding of these commercial species is prohibited and comparison between inspector 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 inspectors are referred to as ‘Inspectors’ and unlike most inspectors have the authority to fine or charge the vessel with criminal charges.

195 2005/2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.

All fisheries are subject to observation but the extent of inspector coverage varies, it is likely to be 1-2% on average but there are some exceptions for example 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. The main species that may be caught with ISS herring are blue whiting (*Micromesistius poutassou*), capelin (*Mallotus villosus*), mackerel (*Scomber scombrus*) and AS herring (*Clupea harengus*). These transboundary stocks are subject to ICES stock assessment and TAC-setting, although for blue whiting, capelin and mackerel, lack of agreement on quota allocations between coastal states has resulted in catches exceeding advice. However, latest ICES advice shows that all are above their biological limit points and with the exception of mackerel¹⁹⁶ are above MSY Btrigger, where this is defined. 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*)¹⁹⁷ and porbeagle (*Lamna nasus*), basking shark (*Cetorhinus maximus*) and spurdog (*Squalus acanthias*)¹⁹⁸ 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 inspector 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 inspector programme to cover by-catch such as elasmobranchs (pers. comm. MFRI, site visit) and records for by-catch species including skate (*Dipturus batis*), Atlantic halibut, dogfish, Greenland shark (*Somniosus microcephalus*) and porbeagle (*Lamna nasus*) can be seen in the catch data available via the Fisheries Directorate website (<http://www.fiskistofa.is/english/quotas-and-catches/>). These are seen to be either vulnerable or endangered, threatened or protected (ETP) species. However, these species are unlikely to interact significantly with the gears used in the ISS herring fishery; in the last year, there were no landings reported of these species by pelagic/mid-water gears (June 2017 - June 2018).

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 wolffish reduce fishing during the main spawning period of these species. Spawning areas of herring are not closed to fishing but there is no directed fishery for herring during their spawning season. However, other fisheries may impact these grounds for example the fishery targeting haddock which feed on herring eggs and are fished during herring spawning season (pers. com. MFRI, site visit).

Interactions of fishing gear with benthic ecosystems

Interactions between fishing gears and the seabed are highly dependent on gear type. Pelagic gears used in this fishery are not designed to be used in contact with the seafloor and considered unlikely to interact significantly with benthic ecosystems. The spatial distribution of fishing effort around Iceland is known, available data on fishing effort of the Icelandic fleet provided by satellite Vessel Monitoring Systems (VMS) are very accurate and have made it possible to map in detail the distribution of fishing effort.

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It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; sponge communities, cold-water corals and hydrothermal vents), from significant adverse impact from bottom contacting 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.

¹⁹⁶ Although as noted in the previous clause the recent mackerel inter-benchmark suggests stock size is under-estimated in the latest advice and the stock exceeds MSY Btrigger.

¹⁹⁷ Regulation 470/2012. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302>

¹⁹⁸ Regulation 456/2017. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017>

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. A map indicating most of the current closures in Icelandic waters is shown in clause 3.1.1.

VMEs of particular importance within Icelandic waters are sponge and cold-water coral communities and hydrothermal vent areas. Increasingly attention is also being given to sea-pen communities. Further information on these communities and habitats is provided in clause 3.1.1. As noted previously pelagic gears are thought to have minimal interaction with these seabed VMEs.

Interactions with Seabirds and Marine Mammals

By-catch of marine mammals and seabirds in Icelandic waters has not been systematically investigated until very recently. Based on a study by Pálsson *et al.* (2015), most of the marine mammal by-catch is expected to come from the gill net fisheries for cod and lumpfish close to the coast but there is the potential for smaller numbers of marine mammals to be caught in the pelagic trawls and purse seines targeting herring, capelin, mackerel and blue whiting¹⁹⁹.

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

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. In total there are 171 marine mammal and seabird species pre-programmed into the electronic logbook system that are selectable by fishers. 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 MRFI²⁰⁰ noted bycatch rates were 5 times higher when an inspector was present in 2014-2016 than when they were absent.

In its latest report to the North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on Bycatch, Iceland noted that there were no reports of by-catch from the pelagic trawl fleet, even with 'decent' inspector coverage and with 'very high' inspector coverage in the mid-water trawl fleet of 10 vessels. The working group requested more detail on the inspector effort to provide more confidence in this finding of no by-catch in the pelagic trawl fleet. They also noted 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 increasing²⁰¹.

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 provided in clause 3.1.1).

199 NAMMCO (2017). North Atlantic Marine Mammal Commission. Report of the 24th Scientific Committee meeting, 14-17 November 2017. <https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf>

200 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>

201 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>

ISS herring is important for killer whale (*Orcinus orca*) which in Iceland mainly prey upon herring and mackerel. There are on-going studies documenting this association (Sammara *et al.*, 2017a,b, cited in NAMMCO, 2017). Fishermen report that killer whale are generally not seen during trawling for ISS herring. They are frequently observed during the purse seine fishery but fishermen report that interactions with the gear are rare. Adult killer whales are generally able to make their own way out of the net but can cause significant damage if they are caught and need to be cut free. If it looks likely that a killer whale will be caught the gear is released to prevent damage to it (pers. com. site visit). In relation to understanding of their population and its status, the last review of killer whales in the North Atlantic dates from 1987. The NAMMCO Scientific Committee recommended in their last meeting that a review be undertaken of all available information and current research activities on abundance, stock structure, and movements of killer whales in the North Atlantic in readiness for their next meeting. Initial abundance estimates for Icelandic waters range from 4,000-6,847 killer whales but these estimates may include killer whales from several populations over large areas. A recent study identified a minimum of 314 individuals regularly using the waters off the southern and west coasts of Iceland (Tavares *et al.*, 2016 cited in²⁰²) and the MFRI, through their long-term killer whale project, have published a catalogue containing over 400 killer whale individuals identified between 2006 and 2015 on their website in 2017: <https://www.hafogvatn.is/static/research/files/hv2017-005pdf>.

Although evidence of the degree to which ISSH fisheries and marine mammals interact is sparse available evidence would indicate that, in Icelandic waters, direct mortality of marine mammals as a result of interactions with pelagic fishing gears used in the fishery is likely to be low and unlikely to have detrimental effects at the population level. Further evidence of reliable data collection from the improved inspector programme and electronic logbooks reporting system is required to increase confidence in this judgement.

Indirect effects including competition between fisheries and marine mammals and seabirds for stocks of forage species such as capelin, herring, mackerel etc. are likely to pose a greater threat to populations of marine mammals and seabirds than direct fishing related mortality. These potential ecosystem effects of the ISS herring fisheries are discussed in more detail in the supporting evidence for Clause 3.2.4. Foodweb Considerations.

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

202 NAMMCO <https://nammco.no/topics/killer-whale/#1475844082849-433d5060-e5a9>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Information is 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 are monitored and their state assessed, as appropriate.			
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 minimum mesh size for herring seines is 31.4 mm, the minimum codend mesh size in pelagic trawls targeting herring is 40 mm and the minimum mesh size (stretched) for herring driftnets is 63 mm ²⁰³ . The use of sorting grids in trawls may be required in some areas, if it is felt this is necessary to avoid bycatch.			
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. 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. The MFRI provides annual catch advice for 35 different species, while catch statistics are routinely collected and publicly available for many more. 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 species²⁰⁴, as appropriate and relevant in the context of the unit of certification.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Both the pelagic trawling and purse seining gears used in the ISS herring fishery have the potential to capture a range of endangered, threatened and protected species (ETP) species. Data on interactions between non-commercial by-catch including marine mammals and seabirds and Icelandic gears has not been collected systematically until very recently. There have been issues noted with regard to reliable recording of by-catch by inspectors and under-reporting of by-catch by fishers in relation to the lumpsucker gillnet fishery. As of February 2014, stricter rules were implemented 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 inspectors. 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.			

²⁰³ <https://www.reglugerdir.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/7553>

²⁰⁴ 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.

The available evidence indicates by-catch of non-commercial fish species, marine mammals and seabirds that may be considered ETP species is considered very low. This indicates that information is available on the potential effect of fishing on ETP species, as appropriate and relevant in the context of the unit of certification. Further evidence of reliable data collection from the improved inspector programme and electronic logbooks reporting system would increase confidence in this judgement.

Evidence:

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^{205, 206}.

Iceland has also ratified a number of international conventions on species protection and management, 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 Resources²⁰⁷. 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.

ETP species listed under these conventions include the 5 species of baleen whales common in Icelandic waters namely blue (*Balaenoptera musculus*), fin (*B. physalus*), sei (*B. borealis*), minke (*B. acutorostrata*) and humpback whales (*Megaptera novaeangliae*), which are all listed under Appendix I of CITES. A number of toothed whales common in Icelandic water are also listed under CITES Appendix I namely sperm (*Physeter macrocephalus*) and northern bottlenose (*Hyperoodon ampullatus*) whales. Other common odontocetes not protected under Appendix I but listed under Appendix II are the killer (*Orcinus orca*) and long-finned pilot whales (*Globicephala melas*), white-beaked (*Lagenorhynchus albirostris*) and Atlantic white-sided dolphins (*L. acutus*) and harbour porpoises (*Phocoena phocoena*).

The harbour seal (*Phoca vitulina*) and the grey seal (*Halichoerus grypus*) are the only seal species to regularly pup around Iceland but four other species visit the island as vagrants, namely harp seal (*Phoca groenlandica*), bearded seal (*Erignathus barbatus*), hooded seal (*Cystophora cristata*) and ringed seal (*Phoca hispida*). Seals are not protected under national legislation or under binding international agreement such as CITES appendix I.

A number of the bird species recorded as incidental catch in Icelandic fisheries²⁰⁸ are listed under IUCN Red List of Threatened Species, namely Atlantic puffin (*Fratercula arctica*) and northern fulmar (*Fulmarus glacialis*) both classed as endangered and eider duck (*Somateria mollissima*) classed as vulnerable (all European assessments made in 2015, <http://www.iucnredlist.org/>). Atlantic puffin and eider duck are listed under AEWA but northern fulmar is not. Icelandic ETP species are listed in Table 22.

Table 22. Selection of ETP species in Icelandic waters.

Common name	Scientific name	National legislation	CITES App. I	BERN	OSPAR	AEWA
Atlantic halibut	<i>Hippoglossus hippoglossus</i>	Y				
Basking shark	<i>Cetorhinus maximus</i>	Y		Y	Y	
Porbeagle	<i>Lamna nasus</i>	Y			Y	
Spurdog	<i>Squalus acanthias</i>	Y			Y	
Sperm whale	<i>Physeter macrocephalus</i>		Y	Y		
Harbour porpoise	<i>Phocoena phocoena</i>				Y	

205 Regulation 470/2012. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/18302>

206 Regulation 456/2017. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/0456-2017>

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 MRFI (2018b). By-catch of seabirds and marine mammals in Lump sucker gillnets 2014-2017.

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

Northern bottlenose whale	<i>Hyperoodon ampullatus</i>		Y	Y		
Blue whale	<i>Balaenoptera musculus</i>		Y	Y	Y	
Fin whale	<i>Balaenoptera physalus</i>		Y	Y		
Sei whale	<i>Balaenoptera borealis</i>		Y	Y		
Minke whale	<i>Balaenoptera acutorostrata</i>		Y	Y		
Humpback whale	<i>Megaptera novaeangliae</i>		Y	Y		
Atlantic puffin	<i>Fratercula arctica</i>					Y
Eider duck	<i>Somateria mollissima</i>					Y

Both the pelagic trawling and purse seining gears used in the ISS herring fishery have the potential to capture a range of ETP species. Data on interactions between non-commercial by-catch including marine mammals and seabirds and Icelandic gears has not been collected systematically until very recently. There have been issues noted with regard to reliable recording of by-catch by inspectors and under-reporting of by-catch by fishers in the lump sucker gillnet fishery. As of February 2014, stricter rules were implemented 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)²⁰⁹ and supervision of inspectors.

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).

However, by-catch of marine mammals and seabirds is considered very low. In its latest report to the North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on Bycatch, Iceland noted that there were no reports of by-catch from the pelagic trawl fleet, even with 'decent' inspector coverage and with 'very high' inspector coverage in the mid-water trawl fleet of 10 vessels. Although it should be noted that the Working Group requested more detail on inspector effort to provide more confidence in the finding of no by-catch²¹⁰. A similar situation exists for vulnerable fish species that may be considered ETP, notably the skate, Atlantic halibut, spurdog and Greenland shark referred to in clause 3.1.1. These species are unlikely to interact significantly with the gears used in the ISS herring fishery and in the last year, there were no landings reported of these species by pelagic / mid-water gears (June 2017 - June 2018). This indicates suitable steps are made to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of the unit of certification.

References: See footnotes.

Non-Conformance Number (if relevant)

NA

209 Regulation No. 126/2014. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967>

210 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>

8.3.2.2 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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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 MRI 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:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
Although evidence of the degree to which ISS herring fisheries and marine mammals interact is sparse available evidence would indicate that, in Icelandic waters, direct mortality of marine mammals as a result of interactions with pelagic fishing gears used in the fishery is likely to be low and unlikely to have detrimental effects at the population level. This 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 inspector programme and electronic logbooks reporting system would increase confidence in this judgement.			
Evidence:			
Data on interactions between marine mammals and seabirds and Icelandic gears has not been collected systematically until very recently. There have been issues noted with regard to reliable recording of by-catch by inspectors and under-reporting of by-catch by fishers in the lump sucker gillnet fishery. As of February 2014, stricter rules were implemented ²¹¹ 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 inspectors. 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.			
By-catch of marine mammals and seabirds is considered very low. In its latest report to the North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on Bycatch, Iceland noted that there were no reports of by-catch from the pelagic trawl fleet, even with 'decent' inspector coverage and with 'very high' inspector coverage in the mid-water trawl fleet of 10 vessels. Although it should be noted that the Working Group requested more detail on inspector effort to provide more confidence in the finding of no by-catch ²¹² .			

211 Regulation No. 126/2014. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967>

212 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>

ISS herring is important for killer whale (*Orcinus orca*) which in Iceland mainly prey upon herring and mackerel. There are on-going studies documenting this association (Sammara *et al.*, 2017a,b, cited in²¹³). Fishermen report that killer whale are generally not seen during trawling for ISS herring. They are frequently observed during the purse seine fishery but fishermen report that interactions with the gear are rare. Adult killer whales are generally able to make their own way out of the net but can cause significant damage if they are caught and need to be cut free. If it looks likely that a killer whale will be caught the gear is released to prevent damage to it (pers. com. site visit).

In relation to understanding of their population and its status, the last review of killer whales in the North Atlantic dates from 1987. The NAMMCO Scientific Committee recommended in their last meeting that a review be undertaken of all available information and current research activities on abundance, stock structure, and movements of killer whales in the North Atlantic in readiness for their next meeting. Initial abundance estimates for Icelandic waters range from 4,000-6,847 killer whales but these estimates may include killer whales from several populations over large areas. A recent study identified a minimum of 314 individuals regularly using the waters off the southern and west coasts of Iceland (Tavares *et al.*, 2016 cited in²¹⁴) and the MFRI, through their long-term killer whale project, have published a catalogue containing over 400 killer whale individuals identified between 2006 and 2015 on their website in 2017: <https://www.hafogvatn.is/static/research/files/hv2017-005pdf>.

Although evidence of the degree to which ISSH fisheries and marine mammals interact is sparse available evidence would indicate that, in Icelandic waters, direct mortality of marine mammals as a result of interactions with pelagic fishing gears used in the fishery is likely to be low and unlikely to have detrimental effects at the population level. This 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 inspector programme and electronic logbooks reporting system would improve confidence in this judgement. Further supporting information on the interaction between the fishing gears and marine mammals an seabirds is found 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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Summary 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, spurdog, porbeagle and basking shark 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. This fishery targets dense shoals of herring and the catch tends to be homogenous with little mixing with other stocks. The main species caught with ISSH are subject to stock assessment and TAC-setting and all are above their biological limit points. There is likely to be little interaction between this pelagic fishery and identified vulnerable species which are demersal. Consequently 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: 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.				
References:	See footnotes.			
Non-Conformance Number (if relevant)	NA			

213 NAMMCO (2017). North Atlantic Marine Mammal Commission. Report of the 24th Scientific Committee meeting, 14-17 November 2017. <https://nammco.no/wp-content/uploads/2018/01/08-nammco-26-scientific-committee-report.pdf>

214 NAMMCO <https://nammco.no/topics/killer-whale/#1475844082849-433d5060-e5a9>

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
<p>Summary Evidence:</p> <p>Both the pelagic trawling and purse seining gears used in the ISS herring fishery have the potential to capture a range of ETP species. Data on interactions between non-commercial by-catch including marine mammals and seabirds and Icelandic gears has not been collected systematically until very recently. There have been issues noted with regard to reliable recording of by-catch by inspectors and under-reporting of by-catch by fishers in the lumpsucker gillnet fishery. As of February 2014, stricter rules were implemented 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 inspectors. 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.</p> <p>However, by-catch of marine mammals and seabirds is considered very low. In its latest report to the North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on Bycatch, Iceland noted that there were no reports of by-catch from the pelagic trawl fleet, even with ‘decent’ inspector coverage and with ‘very high’ inspector coverage in the mid-water trawl fleet of 10 vessels. Although it should be noted that the Working Group requested more detail on inspector effort to provide more confidence in the finding of no by-catch. A similar situation exists for vulnerable fish species that may be considered ETP, notably the skate, Atlantic halibut, spurdog and Greenland shark referred to in clause 3.1.1. These species are unlikely to interact significantly with the gears used in the ISS herring fishery and in the last year, there were no landings reported of these species by pelagic / mid-water gears (June 2017 - June 2018). This indicates suitable steps are made to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of the unit of certification.</p> <p>Evidence:</p> <p>A number of species are protected under national fisheries regulations including Atlantic halibut and spurdog which prohibits directed fisheries and requires live fish to be released to the sea and recorded in the electronic logbook.</p> <p>Iceland has also ratified a number of international conventions on species protection and management, 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 Resources²¹⁵.</p> <p>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.</p> <p>ETP species listed under these conventions include the 5 species of baleen whales common in Icelandic waters namely blue (<i>Balaenoptera musculus</i>), fin (<i>B. physalus</i>), sei (<i>B. borealis</i>), minke (<i>B. acutorostrata</i>) and humpback whales (<i>Megaptera novaeangliae</i>), which are all listed under Appendix I of CITES. A number of toothed whales common in Icelandic water are also listed under CITES Appendix I namely sperm (<i>Physeter macrocephalus</i>) and northern bottlenose (<i>Hyperoodon ampullatus</i>) whales. Other common odontocetes not protected under Appendix I but listed under Appendix II are the killer (<i>Orcinus orca</i>) and long-finned pilot whales (<i>Globicephala melas</i>), white-beaked (<i>Lagenorhynchus albirostris</i>) and Atlantic white-sided dolphins (<i>L. acutus</i>) and harbour porpoises (<i>Phocoena phocoena</i>).</p>			

215 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>

The harbour seal (*Phoca vitulina*) and the grey seal (*Halichoerus grypus*) are the only seal species to regularly pup around Iceland but four other species visit the island as vagrants, namely harp seal (*Phoca groenlandica*), bearded seal (*Erignathus barbatus*), hooded seal (*Cystophora cristata*) and ringed seal (*Phoca hispida*). Seals are not protected under national legislation or under binding international agreement such as CITES appendix I.

A number of the bird species recorded as incidental catch in Icelandic fishing gears (gillnets and demersal trawls)²¹⁶ are listed under IUCN Red List of Threatened Species, namely Atlantic puffin (*Fratercula arctica*) and northern fulmar (*Fulmarus glacialis*) both classed as endangered and eider duck (*Somateria mollissima*) classes as vulnerable (all European assessments made in 2015, <http://www.iucnredlist.org/>). Atlantic puffin and eider duck are listed under AEWA but northern fulmar is not.

Both the pelagic trawling and purse seining gears used in the ISS herring fishery have the potential to capture a range of ETP species. Data on interactions between non-commercial by-catch including marine mammals and seabirds and Icelandic gears has not been collected systematically until very recently. There have been issues noted with regard to reliable recording of by-catch by inspectors and under-reporting of by-catch by fishers. As of February 2014, stricter rules were implemented 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)²¹⁷ and supervision of inspectors. 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).

However, by-catch of marine mammals and seabirds is considered very low. In its latest report to the North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee Working Group on Bycatch, Iceland noted that there were no reports of by-catch from the pelagic trawl fleet, even with ‘decent’ inspector coverage and with ‘very high’ inspector coverage in the mid-water trawl fleet of 10 vessels. Although it should be noted that the Working Group requested more detail on inspector effort to provide more confidence in the finding of no by-catch. A similar situation exists for vulnerable fish species that may be considered ETP, notably the skate, Atlantic halibut, spurdog and Greenland shark referred to in clause 3.1.1. These species are unlikely to interact significantly with the gears used in the ISS herring fishery and in the last year, there were no landings reported of these species by pelagic / mid-water gears (June 2017 - June 2018). This indicates suitable steps are made to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of the unit of certification.

References:	See footnotes.
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
None <input checked="" type="checkbox"/>			
Summary Evidence:			
Appropriate steps are taken to avoid the loss of fishing gear and ghost fishing of lost and abandoned gear.			
Evidence:			
Several initiatives and regulations are 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).			

216 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>

217 Regulation No. 126/2014. <https://www.reglugerd.is/reglugerdir/eftir-raduneytum/sjavarutvegsraduneyti/nr/18967>

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 Regulations²¹⁸. 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.

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.

The Icelandic ITQ system allows for a slower paced fishery than would be expected if there was only an overall TAC with all boats fishing against it. The system allows fishers to target their efforts in optimum weather conditions leading to decreased rates of lost fishing gear.

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

²¹⁸ <http://vefbirting.odd.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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>An array of permanent, seasonal and real-time closures are implemented by Icelandic authorities to protect spawning and juvenile fish. Vulnerable Marine Ecosystems (VMEs) have been identified and protected in closures. Interactions with these seabed VMEs are considered limited since the pelagic gears used in this fishery are not designed to be used in contact with the seafloor. Consequently, action has been taken to avoid, minimise or mitigate impacts on spawning, nursery areas or other essential habitats that are at risk from the negative impacts of the fishing gear.</p>			
Evidence:			
<p>Icelandic authorities have implemented an extensive array of permanent, seasonal and periodic real closures within the Icelandic EEZ. 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.</p> <p>There is also a system of real time spatial closures in operation in Iceland aimed at protecting juvenile fish which has been in operation since 1976. Under this system areas in which the proportion of fish below the minimum legal saleable size in catches has been observed by inspectors to exceed a certain percentage are closed for a period of two weeks; or one week in the case of pelagic species. Repeated short term temporary closures in an area can lead to the area being closed on a more permanent basis.</p> <p>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. As noted previously pelagic gears are thought to have minimal interaction with these seabed VMEs.</p> <p>For more information relating to closed areas within the Icelandic EEZ see supporting evidence for clause 3.1.</p>			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>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. However, it should be noted that the pelagic gears used in this fishery are not designed to be used in contact with the seafloor and considered unlikely to interact significantly with this habitat.</p>			
Evidence:			
<p>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</p>			

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 also 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.

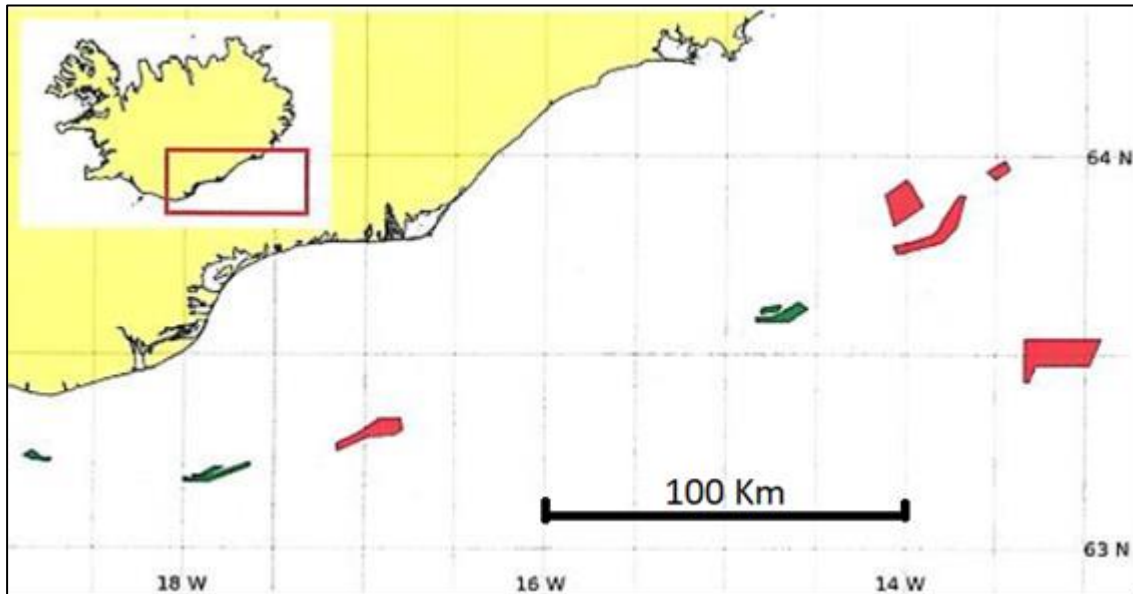


Figure 52. Ten coral closures in South East Iceland, current as of November 2018. Maps can be viewed by downloading Google Earth and clicking on the following kml file produced by the Directorate of Fisheries <http://uv.fiskistofa.is/uv.kml>

As noted previously pelagic gears are thought to have minimal interaction with these seabed VMEs

Further supporting information is provided in clause 3.1.

References:	See footnotes.
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
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. However, it should be noted that the pelagic gears used in this fishery are not designed to be used in contact with the seafloor and considered unlikely to interact significantly with this habitat.			
Evidence:			
Please see the evidence provided under clause 3.2.3.2.			
References:	See footnotes.		
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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>

Summary Evidence: Known thermal vents structures are protected through area closure to fishing activities with gear that has significant bottom impact during normal operation. However, the pelagic gears used in this fishery are not designed to be used in contact with the seafloor and considered unlikely to interact significantly with this habitat during normal operation.

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 series of chimneys and fissures on the Icelandic continental shelf. Both are inside Eyjafjörður to the north of the island and are fully protected by environmental law (see map below). 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.



Figure 53. Coordinates and location of protected natural resources (i.e. hydrothermal vent) at Arnarnesstrýtur in Eyjafjörður north of the Arnarnes river²¹⁹.

As noted previously pelagic gears are thought to have minimal interaction with these seabed VMEs.

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

²¹⁹ https://www.ust.is/library/Skrar/Einstaklingar/Fridlyst-svaedi/Auglysingar/Hverastrytur_Arnarnesnofum_kort.pdf

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 <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>Herring is a key prey species in the ecosystem, together with a number of other abundant, high biomass stocks with similar levels of trophic connectivity notably capelin, blue whiting and mackerel. It is above its precautionary limit and these other stocks are above their MSY reference points where these are defined (Capelin does not have a defined MSY reference point but is currently well above its limit reference point). The Icelandic harvesting policy and management measures means that there is little risk of Icelandic fisheries reducing herring stocks to the point where populations of dependent predators would be adversely affected. Through Iceland’s involvement in the MAREFRAME project, work is progressing to improve the evidence base and develop new tools including the Atlantis model, to further implementation of the ecosystem-based approach to fisheries management. Available evidence would therefore suggest that indirect impacts of ISS herring fisheries are unlikely to have severe adverse impacts on dependent predators.</p>			
Evidence:			
<p>In Icelandic waters herring are both a major predator of zooplankton and an important prey species with numerous species of fish, marine mammals and seabirds all being major predators of herring. Herring therefore, are an important part of the ecosystem with many trophic connections. However, the Icelandic marine ecosystem is not considered to be wasp-waisted due to the presence of several other abundant, high biomass, low trophic level stocks including capelin, mackerel and blue whiting. These other abundant high biomass stocks demonstrate similar levels of trophic connectivity and provide alternative pathways through which energy can be transferred to higher trophic levels. In addition, predators of herring are primarily highly mobile, opportunistic feeders that are not reliant exclusively on herring as a food source. The ISS herring stock biomass has been significantly above precautionary limits in recent years reaching its highest estimated levels in the late 2000s before falling recently due to high natural mortality caused by an <i>Ichthyophonus</i> infection and poor recruitment. Given the current management regime, there is little risk of Icelandic fisheries reducing herring stocks to the point where populations of dependent predators would be adversely affected²²⁰.</p> <p>Iceland is involved in work to progress implementation of an ecosystem-based approach to fisheries management (EBFM) through its involvement in the EC-funded MAREFRAME project. MAREFRAME seeks to remove the barriers preventing more widespread use of EBFM by improving the evidence base and developing new tools and technologies - in collaboration with stakeholders so as to ensure ownership, acceptance and uptake of project outcomes. Part of the project has involved developing an ‘end-to-end’ dynamic ecosystem model of Icelandic waters using the Atlantis framework. Fisheries advice is currently largely based on single-species stock assessment models, whereas ecosystem models provide an opportunity to consider species interactions and environmental factors - important considerations in EBFM. Testing showed the sensitivity of the model to key parameters including recruitment relationships used and the effect of environmental conditions and the reliability of the model for non-commercial groups could not be tested due to a lack of data. However, the model was able to replicate the time-series of biomass and landings for the most important commercial groups and it is considered to provide a solid basis for evaluating alternative ecosystem and fisheries management scenarios and should produce reliable results for the most important commercial groups to support EBFM in Iceland²²¹. MRFI expect the model will provide a good platform for testing current knowledge on ecosystem functions and will help in identifying gaps in knowledge (pers com, site visit). Available evidence would suggest that indirect impacts of ISS herring fisheries are unlikely to have severe adverse impacts on dependent predators and the integrity of the stock’s role in the marine ecosystem is most likely protected.</p>			
References:	See footnotes.		
Non-Conformance Number (if relevant)	NA		

220 MFRI (2018a).

MFRI (2019). Advice on herring. https://www.hafogvatn.is/static/extras/images/Sild_20191141534.pdf

221 Sturludottir, E., Desjardins, C., Elvarsson, B., Fulton, E. A., Gorton, R., Logemann, K. and Stefannson, G (2018). End-to-end model of Icelandic waters using the Atlantis framework: exploring system dynamics and model reliability. Fisheries Research, 207, pp9-24. <https://doi.org/10.1016/j.fishres.2018.05.026>

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 approach²²², as being of serious concern in the fishery in question.

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
Summary Evidence:			
<p>The most probable adverse impacts of the Icelandic fisheries are considered and those impacts likely to have serious consequences are addressed. Consideration of the adverse impacts of the fishery on the ecosystem and resulting management actions are demonstrably consistent with the precautionary approach outlined in the IRFF Standard</p>			
Evidence:			
<p>Icelandic government policy aims to protect vulnerable marine ecosystems from significant adverse impact from fishing and legislation exists to provide for the prohibition of fishing activities with bottom-contacting gear in areas where vulnerable ecosystems occur. The annual MFRI advice book includes a specific section on the ecosystem impacts of Icelandic fisheries²²³. 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.</p> <p>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 minister of Fisheries 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.</p> <p>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 bycatch grids when fishing for pelagic species in certain areas.</p> <p>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.</p>			
Consistency of management of the fishery's ecosystem impacts with the precautionary approach.			
<p>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 provisions outlined in the IRFF Standard v2.0.</p>			
References:	<p>MFRI (2018a). Condition of Marine Resources and Advice 2018. Marine Research Institute, February 2, 2018: https://www.hafogvatn.is/static/extras/images/LodnaJan2018331367.pdf</p>		
Non-Conformance Number (if relevant)	NA		

²²² 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. ...

²²³ MFRI (2018a). Condition of Marine Resources and Advice 2018. Marine Research Institute, February 2, 2018. <https://www.hafogvatn.is/static/extras/images/LodnaJan2018331367.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 do not consider a recommendation regarding the conservation of sponges/sea-pens to be a useful addition here since this fishery is prosecuted entirely with pelagic/mid-water gears.

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.	No response required.

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	The overall TAC is set according to a harvest control rule, as 15% of the standing biomass of herring 4 years and older. These can deviate to a certain percentage over or under the advice, but is there a precautionary limit to these deviations?	There is no specific defined limit to the sum of possible transfers and exceptions; however, each kind of transfer has its specific limitations so there is a limit to the amount of deviation in any particular year. The current HCR rule is relatively new, having been formally adopted in June 2017. In each year since the implementation of the current HCR, TACs have been in line with recommendations. The ongoing performance of the HCR will be evaluated at annual surveillance audits.
1.1.3		
1.1.4		
1.1.5	If the TAC deviates from the advice section 1.1.2 mentions that ‘very compelling and concrete arguments have been needed in the few instances in recent years when the Ministry has allowed bigger total allowable catches than recommended by the Institute’ are these arguments made available by the Ministry?	The statement was taken from the Fiskistofa website. For herring, the TAC was above advice in 2011/12 and 2012/11 <u>but that was prior to the implementation of the current HCR</u> . It is expected that, with the current FMP in place, such deviations will no longer occur. In each year since the implementation of the current HCR, TACs have been in line with recommendations.
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		

#	Peer Reviewer Comments	Assessment Team Response
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	Evidence rating not indicated.	Fixed with thanks.
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		
1.5.3		

#	Peer Reviewer Comments	Assessment Team Response
1.5.4		
1.5.5		
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	<p>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?</p> <p>As detailed in the background section: 'Currently these two stocks (ISS and AS herring) have quite separate distribution patterns and do not mix in Icelandic grounds, although previously they shared similar feeding grounds in early summer, north or east of Iceland.' However, NSS herring is assessed under retained bycatch. And 'However, a significant minority of ISS herring catches are also made in offshore mixed pelagic fisheries directed at mixed shoals of AS herring, ISS herring and mackerel and herring are also sometimes caught in small volumes in conjunction with blue whiting and capelin.' Is it possible to separate the different stocks or are they inseparable? Or only estimated from gonad sampling?</p>	<p>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.</p> <p>We note the apparent contradiction in the report. The background text is perhaps too definitive and so it has been updated to clarify that some mixing may occur. For example, MFRI's latest advice for ISS herring refers to it being taken as by-catch in the fishery for mackerel and NSS (AS) herring east, south and west of Iceland (MFRI, 2019). In relation to the question about distinguishing stocks, yes, the maturity stage of catch samples is used to distinguish herring stocks in mixed-stock fisheries (ICES, 2015).</p> <p>MFRI, 2019: https://www.hafogvatn.is/static/extras/images/Sild_20191141534.pdf</p> <p>ICES, 2015. Stock Annex: Herring (<i>Clupea harengus</i>) in Division 5.a, summer-spawning herring (Iceland grounds) http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2015/hervasu_SA.pdf</p>
3.1.2	N/A	
3.2	Specific Criteria	
3.2.1	Information gathering and advice	
3.2.1.1	N/A	
3.2.1.2	Is there a time frame for the use of the smart phone app to be implemented? Will this be reviewed. Otherwise agree with the score	Based on information presented on the site visit, the app is ready but current legislation needs to be amended to implement it. Progress in implementation will be checked on surveillance audits.
3.2.2		
3.2.2.1	N/A	
3.2.2.2	N/A	

#	Peer Reviewer Comments	Assessment Team Response
3.2.2.3	N/A	
3.2.2.4	As detailed more information on observer data is required to give confidence in the finding of no by-catch.	Comment acknowledged.
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.	On the site visit MFRI noted that they review lists of VME indicator species (ICES, OSPAR) and incorporate them into their monitoring (e.g. see NovasArc). Closures are kept under review in light of fishing footprint and benthic habitat mapping so further closures may be anticipated where potential conflicts arise. NovasArc: https://novasarc.hafogvatn.is/vmes/ .
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	The 3 rd paragraph in the evidence is contradictory. It should be noted here that the stock is currently above its precautionary ref point. A lot of information is given about the work to improve the stock assessment models but how this is translated into harvesting policy and management measures is unclear from the evidence presented here.	The Assessment Team does not see the contradiction in the text? The preceding paragraphs note the importance of herring as a major predator of zooplankton and important prey for a wide range of species but that the ecosystem is not 'wasps-waisted', i.e. not solely reliant on herring, due to the presence of other high-abundance stocks such as capelin, mackerel and blue whiting through which energy can flow from lower to higher levels. Having set this context, the third paragraph then focusses on the status of the herring stock, noting that the stocks have been very healthy but have declined recently due to high natural mortality. The stocks are currently above their limit reference point but in fact below their precautionary reference point.
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.

Where non-conformances requiring corrective actions on behalf of the fishery have been raised, for each such non-conformance, please provide:

- An indication of whether or not you believe the non-conformances are appropriate.
- An indication of whether or not you believe the Corrective Action Plan is appropriate and likely to address the non-conformance within the specified timeframe.

Non-conformance #1 (Clause 2.3.2.4: Minor Non-conformance).

Although required by legislation, there is some evidence of non-reporting/under-reporting of seabirds and marine mammals bycatch such that the Assessment Team cannot be fully confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks.

From the evidence supplied it is clear that under-reporting of seabirds and marine mammals is occurring, therefore the minor non-conformance is appropriate.

The Corrective Action Plan is appropriate especially with regards to the technology and training of fishermen, which will help to inform and deliver. I believe the timeframe is reasonable to address the non-conformance but ongoing training of fishermen would help with continued success.

The Peer Reviewer largely agrees with the conclusions of the Assessment Team; therefore, no specific response is required. The Team would like to thank the Reviewer for their input.

9.2. Peer Reviewer B

9.2.1. General comments – Peer Reviewer B

Peer Reviewer Comments	Assessment Team Response
General Comments	
<p>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.</p> <p>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 “strong reasons” not to do so.</p>	<p>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.</p> <p>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.</p>

9.2.2. Scoring element review – Peer Reviewer B

Peer Reviewer Comments	Assessment Team Response
Background Section	
<p>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.</p> <p>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 overshoot is only explained in depth in clauses 1.5.8 and 2.2.1 but this information was relevant to previous scoring clauses.</p>	<p>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.</p>

9.2.2.1 Section 1 – Fisheries Management

#	Peer Reviewer Comments	Assessment Team Response																								
1.1	The Fisheries Management System																									
1.1.1																										
1.1.2	How are TACs set? It is stated that "Since 2017, advice from ICES and MFRI is given according to an adopted management plan." But "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 recent years when the Ministry has allowed bigger total allowable catches than recommended by the Institute". So this last statement makes the decision making process of setting TACs unclear and likely influenced by short-term objectives.	<p>Comment acknowledged. According to Icelandic legislation, the Ministry has the ultimate authority to decide on fisheries management. The statement referred to, which is taken from the official web-site of the Fisheries directorate, refers to the Ministries obligation to follow its decisions. For herring, the TAC was above advice in 2011/12 and 2012/11 <u>but that was prior to the implementation of the current HCR</u>. It is expected that, with the current FMP in place, such deviations will no longer occur. In each of the last 7 fishing seasons (i.e. since 2013/2014), TACs have been in line with recommendations.</p> <table border="1"> <thead> <tr> <th>Season</th> <th>Rec. Tac</th> <th>National TAC</th> </tr> </thead> <tbody> <tr> <td>2013/14</td> <td>87,000</td> <td>87,000</td> </tr> <tr> <td>2014/15</td> <td>83,000</td> <td>83,200</td> </tr> <tr> <td>2015/16</td> <td>71,000</td> <td>71,000</td> </tr> <tr> <td>2016/17</td> <td>63,000</td> <td>63,000</td> </tr> <tr> <td>2017/18*</td> <td>38,712</td> <td>39,000</td> </tr> <tr> <td>2018/19*</td> <td>35,186</td> <td>35,186</td> </tr> <tr> <td>2019/20*</td> <td>34,572</td> <td>34,572</td> </tr> </tbody> </table> <p>*TAC based on current HCR</p>	Season	Rec. Tac	National TAC	2013/14	87,000	87,000	2014/15	83,000	83,200	2015/16	71,000	71,000	2016/17	63,000	63,000	2017/18*	38,712	39,000	2018/19*	35,186	35,186	2019/20*	34,572	34,572
Season	Rec. Tac	National TAC																								
2013/14	87,000	87,000																								
2014/15	83,000	83,200																								
2015/16	71,000	71,000																								
2016/17	63,000	63,000																								
2017/18*	38,712	39,000																								
2018/19*	35,186	35,186																								
2019/20*	34,572	34,572																								
1.1.3																										
1.1.4																										
1.1.5																										
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 Blim being the HCR trigger and it was demonstrated to be precautionary and in line with MSY approach, but that does not	Comment acknowledged. However, the harvest rule for Icelandic herring as for most stocks in the North-East Atlantic, including the Icelandic, is primarily a rule that limits the exploitation pressure (harvest rate or fishing mortality), and not a rule that targets a																								

#	Peer Reviewer Comments	Assessment Team Response
	<p>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.</p>	<p>certain biomass level. With such rules, it is standard practice to demonstrate through simulations that the target exploitation rate does not lead to stock depletion, and that it leads to near maximum long term yield. The criterium is a low probability of falling below a B_{lim}, which is set as a precautionary limit. The near maximum long term yield is slightly more open; there is a trade-off between that and stable catches which is relevant for several Icelandic stocks, including herring.</p> <p>In North-East Atlantic waters, F-rules (or equivalently harvest rate rules) is the dominating design of harvest rules, and an important reason why ICES defines MSY management in terms of a fishing mortality rather than biomass. In other areas, a target biomass is used as a management guideline. This is even reflected in the Johannesburg declaration. However, if the recruitment fluctuates independent of SSB when the SSB is large enough, which is typical in boreal waters, aiming for a target SSB will lead to large fluctuations in the catches. With an F-rule or harvest rate rule, catches will fluctuate with stock abundance, which is mostly driven by recruitment.</p>
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	<p><i>“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.”</i> Please see also 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.</p>	<p>See comment in response to 1.1.2 above and also to Reviewer A.</p>
1.1.10.5		
1.1.10.6		
1.1.10.7		
1.2	Research and Assessment	
1.2.1	<p>What I would like to see here is information specifically related to research on herring carried out by IMFR (ex. what data is collected, what survey are done, are there any specific research projects, etc. i.e. a summary of point 2.2.2) and less what are the IMFR general objectives and means.</p>	<p>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 is assembled under Clause 1.2.2.</p>

#	Peer Reviewer Comments	Assessment Team Response
1.2.2	“the skippers are obliged to establish the stock identity and report by stock.” Is there a possibility for skippers to misreport due to for example non-quota availability for one specific stock? And how accurate are these estimates of stock identity?	Comment acknowledged. As noted in the report, this is mostly a problem where Icelandic summer spawning (ISS) herring appears in fisheries for Norwegian Spring Spawning (NSS) herring and other species like mackerel. Mistakes can always occur, but generally, separating the two stocks is regarded as easy at the actual time of the year, the ISS herring is spawning and the NSS herring is spent, as it spawns before the feeding migration to i.a. Icelandic waters. There are no particular incentives for misreporting by stock, there is additional control by inspectors, that has not caused alarm and the difference should also be apparent at landing, so this is not a major problem.
1.2.3		
1.2.4.1	Is there a high recruitment coming in that causes discards? And what about bycatches and stock identity? Point above on 1.2.2	Comment acknowledged. Last time discarding was suspected (1990-95) large year classes were entering the fishery with large amounts of juveniles in the catch. See also clause 1.3.2.3.3 in the report.
1.2.4.2		
1.2.4.3		
1.2.5		
1.2.6		
1.2.7	N/A	
1.3	The Precautionary Approach	
1.3.1.1		
1.3.1.2	No evidence rate given! The stock is low and decreasing significantly since 2005 but has yet to reach B_{lim} .	Comment acknowledged with thanks the evidence rating has now be correctly assigned. However, we have pointed out in the report the lack of a revisions clause. We recommend that a revision clause is incorporated in the management plan, to account for a situation where SSB is approaching B_{lim} . This is also important because the rule has no reduction of the harvest rate before B_{lim} is reached, and simulations did not take into account the declining recruitment in the last decade.
1.3.1.3	What are the relevant uncertainties? I would like to see at least the major ones listed.	The most important uncertainties in the simulations were: <ul style="list-style-type: none"> • Recruitment: Hockey stick function with annual deviations and autocorrelation • Weights at age: Noise and autocorrelation • Natural mortality (either fixed or simulating Ichthyophonous outbreaks) • Assessment error of the reference biomass (corresponding to herring aged 4 and older) and spawning biomass in the assessment year: <ul style="list-style-type: none"> ◦ 15% bias, based on estimates from empirical retrospective patterns of the analytical assessment, and ◦ stochastic error, autocorrelated in time.

#	Peer Reviewer Comments	Assessment Team Response
		More details can be found in http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/WKICEMSE/
1.3.1.4	Furthermore, no MSY biomass levels have been estimated for this stock. MSYBtrigger used by ICES is actually Bpa, and considering the significant difference between Fmsy and Fpa, one suspects that MSYBtriger and Bmsy are significantly higher than Bpa. So there are no “Appropriate reference points” determined for biomass at MSY. And therefore the information presented does not support the evidence rating assigned.	See Clause 1.1.9.1. A reference point for SSB at MSY is not considered appropriate for this kind of management rule. ICES has defined B _{pa} (which is copied as MSY B _{trigger}) and F _{pa} , based on B _{lim} and 'guesstimates' of assessment uncertainty. They can be useful for reference but are not used in the harvest rule. The harvest rate in the rule was selected as associated with a low probability of passing B _{lim} , taking into account relevant uncertainties (see 1.3.1.3). Priority was on having a low harvest rate with a low trigger biomass, providing stable catches, rather than having a higher harvest rate (equivalent for example to F _{max} or F _{MSY}), which is reduced below a higher trigger biomass.
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 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 1.1.9.1 and 1.3.1.4
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		

#	Peer Reviewer Comments	Assessment Team Response
1.5	Advice and Decisions on TAC	
1.5.1	<i>"Normally, the MFRI advice will be identical to the ICES advice, but it can deviate if there is good reasons for that"</i> Please elaborate on what are the reasons to deviate from advice?	See comment to 1.1.2 and Reviewer A.
1.5.2		
1.5.3		
1.5.4		
1.5.5	<i>"The Ministry has the authority to deviate from the advice, but will only do so if there is strong reasons for that"</i> . This statement makes a strong case against the requirement that "The competent fisheries management authority shall decide on TAC within the boundaries set by the adopted harvesting policy". More explanation is needed to justify the evidence rating assigned.	As 1.5.1. The Ministry still has the legal authority, but if it deviates from its obligation to follow the rule, the certificate may have to be reconsidered.
1.5.6		
1.5.7		
1.5.8	Please see above point on TAC settings decision (1.1.2). <i>"catches have deviated from the TAC in both directions (17% below to 13% above) since 2010"</i> and <i>"In the past, discards of herring may have occurred when large year classes appeared. Presumably, this is a minor problem at present, but the control is sparse."</i> If there is a pulse in recruitment then one suspects that discarding may occur in the future, while TACs have been overshoot in the past (Figure 38) Therefore it is difficult to see how "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". More explanation is needed.	Comment acknowledged. Deviations are allowed for by legislation to provide flexibility within the ITQ system. Permitting deviations in certain circumstances allows operators to flexibly manage their portfolio of quota such that it ultimately matches their catches; this reduces incentives for discarding. Another measure that reduces the incentive to discard is the fact that "undersized" fish only count as half against vessels' quota. Any instances of catches deviating from quota will continue to be examined at annual surveillance audits.
1.5.9	N/A	
1.5.10	N/A	

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	Is the “hook and line quota system” applicable to herring? In addition, “Each fishing year the Minister shall have available harvest rights amounting to up to 12,000 tonnes of un-gutted demersal species” is this also applicable to the herring fishery? Please revise.	No, the “hook and line quota system” is not specifically applicable to herring; however, it is part of the management system and as such its consideration is still relevant.
2.1.2		
2.2	Concordance between actual Catch and allowable Catch	
2.2.1	Please see comments above on clause 1.5.8.	Please see response to 1.5.8.
2.2.2		
2.2.3	What about corrective measures to off-balance the overshoot of the TAC in the herring fishery? The haddock example is an interesting example but is it really applicable to the herring fishery? The herring fishery is already managed at a lower HR for other reasons than to account to TAC overshoot. I can’t see the similarities with herring, so either further explanation is given or the example should be removed and another justification provided.	There are no examples of corrective measures to balance TAC overshoots specific to the herring fishery; therefore, the haddock example has been provided. As explained in the supporting rationale for this clause, since the beginning of the time series catches of ISS herring have fluctuated around parity and there is no clear pattern of catches consistently exceeding TACs. Catch balancing mechanisms contribute to TAC overshoots in some years but over time these inter-annual transfers should balance themselves out. Examination of herring catches Vs TACs for last 20 fishing seasons show this to be the case; therefore, additional corrective actions by management have not been necessary in the case of ISS herring.
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	Table 15 is not applicable to herring fisheries, please revise.	Table has been removed.
2.3.2.2	“For example, at present inspector coverage is focussed on the gillnet fisheries (3.64% of trips accompanied by inspectors) compared to 1.93% and 0.64% of bottom trawl and longline fishing trips, respectively (see Table in clause 2.3.2.1).” not applicable to herring fisheries. Please revise.	Rationale has been revised.

#	Peer Reviewer Comments	Assessment Team Response
2.3.2.3		
2.3.2.4	Non-conformity recording of marine mammals and seabirds. I suspect that in the herring fishery the bycatch issue would be more related to pelagic sharks, but if there is no recording of bycatch of megafauna, then that would also include sharks.	In addition to the landings data, information about interactions between Icelandic fisheries and non-landed species is available from MFRI observer reports. These are periodically compiled and submitted for example to the ICES Working Group on Bycatch (WGBYC) and to NAMMCO (Sigurdsson 2017, ICES 2018h). Available information indicates that interactions between Icelandic pelagic trawl or purse seine vessels and any species that would not be retained and subsequently recorded in the landings database are negligible. For example porbeagle are reported in the landings database but not in recent years from pelagic trawls.
2.3.2.5		
2.3.2.6		
2.3.2.7	What is the method to monitor discards? As stated there are no at-sea observers programmes in Iceland. <i>“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.”</i> Is this the method to monitor discards, between inspected 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 is stated <i>“, should the situation change and discards increase then these changes should be detectable within the system.”</i> This fact is confirmed by the fact that <i>“Coast Guard are also investigating other ways to enhance the detection of discarding drawing on experience elsewhere (Norway) and other technologies including aerial surveillance (pers. com. site visit, November 2018).”</i> And thus the information provided does not support the evidence rate given.	<p>As discussed throughout this report, there are measures in place for the protection of juveniles (i.e. the component most likely to be discarded due to “high grading”) as well as in-built flexibility in the ITQ system which should prevent lack of quota from becoming an incentive to discard. The lack of incentives to discard as well as no evidence that this practice is prevalent within the herring fishery leads the Team to conclude that the risk of significant levels of discarding is likely low.</p> <p>Yes, comparison between inspected 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.</p> <p>The specifics of this clause require that;</p> <ol style="list-style-type: none"> 1. discarding be prohibited; 2. discarding be monitored, and; 3. the method for the monitoring of discards be specified. <p>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.</p>
2.3.2.8		
2.3.2.9		
2.3.2.10		
2.3.2.11		
2.3.2.12		

#	Peer Reviewer Comments	Assessment Team Response
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		

9.2.2.3 Section 3 – Ecosystem Considerations

#	Peer Reviewer Comments	Assessment Team Response
3.1	Guiding Principle	
3.1.1	<p>Please rephrased any reference to observers programme and data. <i>“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.”</i> They are not observers, they are inspectors, which is a very different role. Please rephrase. Comments on 2.3.2.7 are also applicable.</p> <p>More information is needed on capelin. Scientific advice for the TAC was 0 as the stock is in poor shape, but the herring fishery has a bycatch of capelin. So how did the fishery operated considering this bycatch in a precautionary approach?</p>	<p>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, ‘inspector’ has been used to ensure consistent terminology through the report.</p> <p>As noted in clause 3.1.1, the majority of ISS herring are caught in targeted fisheries for ISS herring (63% of total catches in 2017-2018). These catches tend to be quite homogenous containing almost exclusively ISS herring. The remainder of the catch in 2017-2018 was all taken as by-catch in the fishery for AS herring and mackerel. However, in some years ISS herring are also sometimes taken in small volumes with blue whiting and capelin. The extent of capelin catches with herring is likely to be small given the current distribution of ISS herring and capelin stocks (see figure 43, section 3.1.1) resulting in limited overlap of the stocks.</p> <p>The <u>final</u> TAC for capelin has been set at zero for the fishing year 2018/2019. This is the first time this has happened since the 2008/2009 fishing season. There has been no summer or autumn fishery for capelin in 2018 (<u>ICES NWWG Report, 2019</u>). Please note, as described in section 3.1.1, there is a new HCR for the capelin fishery, <u>agreed in 2015</u>, which involves setting an initial TAC (in the December prior to the fishery), intermediate TAC (in the autumn) and final TAC (in January/February) each year. This means whilst an initial TAC may be set at 0, following the results of autumn and winter surveys the final TAC may be higher than 0, as was the case in 2017/2018. In the 2017/2018 fishing year, as in most years since the mid-2000s (<u>ICES Stock Annex</u>), there was no summer or autumn fishery with all catches occurring in the winter period (see section 12.5 and table 12.3.1 of <u>ICES NWWG Report, 2019</u>) when there is greater certainty over the final TAC.</p> <p>Some further text has been added to clarify this.</p> <p>ICES Report of the North West Working Group, 2019. Section 12 Capelin in the Iceland-East Greenland-Jan Mayen area.</p>

#	Peer Reviewer Comments	Assessment Team Response
		<p>Capelin HCR. https://www.government.is/news/article/2018/05/15/Haddock/</p> <p>ICES Capelin Stock Annex, 2015. http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2015/cap-icel_SA.pdf</p>
<p>3.1.2</p>	<p>Please see comments above for capelin. <i>“What information is available suggests mortality is unlikely to have population level effects.”</i> That statement is likely not applicable to capelin, so more information is needed to support the evidence rating.</p>	<p>Given catches of capelin associated with the herring fishery are low, the ISS herring fishery is not likely to be significantly impacting the capelin stock. Nonetheless, there are a number of measures to minimise the risk of population level effects in the capelin fishery including:</p> <ul style="list-style-type: none"> • The HCR referred to previously which includes the setting of an initial precautionary TAC with a very low probability of being higher than the final TAC, an intermediate TAC and a final TAC set in winter with a 95% probability of SSB being greater than or equal to the safe biological limit for the stock (Blim) at spawning time in the following spring. The Coastal States (Iceland, Greenland and Norway) have agreed to use the <u>HCR as the basis for management</u> and there is evidence that this is being applied and complied with. A zero final TAC has been set for the 2018/2019 fishery. • Areas with high abundances of juveniles are subject to immediate temporary closure of the capelin fishery (>20% of the catch composed of fish <13cm), enforced using on-board inspectors (<u>ICES Stock Annex</u>). • To that end, areas with high abundances of juvenile age 1 and 2 capelin (on the shelf region off NW-, N- and NE-Iceland) have usually been closed to the summer and autumn fishery (<u>ICES NWWG Report, 2019</u>). As noted previously summer and autumn fisheries have been infrequent since the mid-2000s. • There are measures in place to reduce the risk of slippage e.g. it is permissible to transfer capelin from one purse seine to another. • In Icelandic waters fishing with pelagic trawl is limited to an area off the NE coast (fishing in January) to protect juvenile capelin and to reduce the risk of affecting the spawning migration route (shuttering of migrating capelin schools by pelagic trawling has been hypothesized) (<u>ICES NWWG Report, 2019</u>) • Coastal states (Iceland, Greenland, Norway) have agreed precautionary measures to protect capelin including delaying start of fishing until October 15th from 2021 (<u>ICES NWWG Report, 2019</u>) <p>ICES further note that profound changes in the distribution, migration and productivity of this capelin stock are likely caused by environmental changes. They urge the need for</p>

#	Peer Reviewer Comments	Assessment Team Response
		<p>further biological studies i.e. regarding life history (including changes in spawning grounds, larval drift and migration at times not observed by autumn and winter surveys) and the role of capelin (predation/prey relationships) as a key species in the ecosystem.</p> <p>Capelin HCR. https://www.government.is/news/article/2018/05/15/Haddock/</p> <p>ICES Capelin Stock Annex, 2015. http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2015/cap-icel_SA.pdf</p> <p>ICES Report of the North West Working Group, 2019. Section 12 Capelin in the Iceland-East Greenland-Jan Mayen area.</p>
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

As stated above, 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 seem to support the conclusion reached and needs additional information. 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 Team would like to thank 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		
<p>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.</p>	<p>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.</p>	
<p>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.</p>		<p>The Team appreciate the feedback. An effort has been made to ensure entities are named consistently throughout the report.</p>
<p>There is a lot of repetition 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.</p>		<p>Again, the Team appreciate the feedback. In future an greater effort will be made to ensure that only directly relevant information is presented for each clause.</p>

9.3.2. Scoring element review – Peer Reviewer C

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. 18, first paragraph under 3.2: Same.	Fixed with thanks.

9.3.2.1 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?	<p>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/).</p> <p>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.</p>
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.
1.1.10.2		
1.1.10.3		
1.1.10.4	Is there a 'description of the process' in the rationale?	Clause 1.1.5 has the most extensive description.
1.1.10.5	It is only stated that consultations take place – a closer description of these consultations is needed.	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

#	Peer Reviewer Comments	Assessment Team Response
		in short there are regular communications between scientists, managers 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.	Agree, the rationale has been revised accordingly. Objectives and management measures directed towards ecosystem effects of the herring fishery is not specifically stated in the management plan but are effectively covered elsewhere by specific technical regulation for herring fisheries that is aimed both at protecting juvenile herring, and other parts of the ecosystem (e.g. a ban on pelagic trawling within 12nm).
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	
1.3.2.1.1		
1.3.2.1.2		
1.3.2.2	Stock biomass	
1.3.2.2.1		

#	Peer Reviewer Comments	Assessment Team Response
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		
1.5.3		
1.5.4		
1.5.5		
1.5.6		
1.5.7		
1.5.8		
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	<p>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?</p> <p>The instances of fees imposed for illegal catches increased tenfold from 2016 to 2017 – any particular reason?</p>	<p>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.</p> <p>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.</p>
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	<p>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</p>	<p>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.</p>

#	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 19: 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 <i>per se</i> (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		

9.3.2.3 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		

9.3.3. Conclusion – Peer Reviewer C

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.

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 mammal bycatch such that the Assessment Team cannot be confident that catch amounts by species and fishing area (of marine mammals and seabirds) are estimated and continually recorded in fishing logbooks.
Rationale:	<p>The recording of marine mammals and seabirds by number and species is required by Icelandic regulation²²⁴.</p> <p>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. 2015²²⁵ and the March 2018 MFRI report titled: "<i>Bycatch of Seabirds and Marine Mammals in lumpsucker gillnets 2014-2017</i>".</p> <p>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.</p> <p>The MFRI 2018 report found that although reported bycatch in E-logbooks by the fleet has increased (suggesting better compliance with reporting requirements) the overall bycatch rates are still much lower than observed in the trips by inspectors. Overall, the marine mammal and seabird bycatch rate during inspector trips was around four times higher than reported by the fleet in 2017²²⁶.</p>

²²⁴ <https://www.reglugerd.is/reglugerdir/efrir-raduneytum/sjavarutveggraduneyti/nr/18967>

²²⁵ <https://www.hafogvatn.is/static/research/files/fjolrit-178.pdf>

²²⁶ <https://www.hafogvatn.is/static/files/skiol/techreport-bycatch-of-birds-and-marine-mammals-lumpsucker-en-final-draft.pdf>

Non-conformance 1 (of 1)	
	<p>Furthermore according to a 2017 presentation to NAMMCO’s Working group on bycatch of marine mammals; <i>“logbooks have unfortunately proven unreliable” and “bycatch of birds and marine mammals [is] 18x higher when observer is present vs logbook records”</i>.</p> <p>While much of the evidence related to non-compliance with reporting requirements may relate to the lumpsucker fishery, this fishery is still part of the management system under review and in addition there is insufficient evidence to show that compliance in the fisheries under assessment here is better.</p>
Corrective Action Plan (CAP):	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Assessment Team evaluation of CAP	<p>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.</p> <p>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.</p> <p>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.</p> <p>Confirmation of the Ministry of Fisheries’ commitment to implementing actions to address this non-conformance can be found in Appendix 2.</p>
Status:	Open – Corrective Actions in place to be reviewed annually at surveillance audits.

10.2. Recommendations

The issues highlighted in this recommendation will be reviewed at subsequent assessment audits.

10.2.1. Recommendation 1

Relevant to clause 1.3.1.2.

At present, the management plan does not have an explicit revision clause; therefore, the Assessment Team recommends that a revision clause be incorporated in the management plan, to account for situations where SSB approaches B_{lim} . This is also important because the harvest rule does not specify a reduction in harvest rate before B_{lim} is reached, and simulations did not take into account declining recruitment in the last decade.

11. Recommendation and Determination

11.1.1. Assessment Team Recommendation

The assessment team recommends that the management system of the applicant fisheries, the Icelandic Summer Spawning Herring commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls and indirectly by gears from other Icelandic fisheries legally landing herring, 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 Summer Spawning Herring commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by purse seine nets and pelagic trawls and indirectly by gears from other Icelandic fisheries legally landing herring, be granted certification.

12. References

Bibliography	Hyperlink (if available):
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Act 116/2006. Fisheries Management Act 2006.	http://www.althingi.is/lagas/nuna/2006116.html
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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 Surveillance 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



To whom it may concern

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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