FAO-BASED ICELAND RESPONSIBLE FISHERIES MANAGEMENT (IRFM) CERTIFICATION PROGRAMME

2nd Surveillance Report

For The

Icelandic Haddock Commercial Fisheries

Including

Transition of Fisheries from IRFM Standard Issue 1 Revision 1 (March, 2014) to Revision 2.0 (July, 2016)

Facilitated By

Iceland Responsible Fisheries Foundation (IRFF)

Assessors: **Sam Dignan, Lead Assessor**
Dankert Skagen, MD, Assessor
Gísli Svan Einarsson, Assessor

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Global Trust Certification Ltd.
3rd Floor, Block 3,
Quayside Business Park,
Mill Street, Dundalk,
Co. Louth, Ireland.
T: +353 42 932 0912
F: +353 42 938 6864
www.GTCert.com

ICELAND RESPONSIBLE FISHERIES
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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
MRI	Marine Research Institute
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 intemational agreements to which the Icelandic authorities are party. Binding intemational agreements as applicable in Icelandic jurisdiction.

i. Summary and Recommendations

The Fisheries Association of Iceland on behalf of the Federation of Icelandic Fishing Vessel Owners (LÍÚ), the Federation of Icelandic Fish Processing Plants (SF) and the National Association of Small Boat Owners, Iceland (NASBO) requested an assessment of the Icelandic haddock *(Melanogrammus aeglefinus)* commercial fisheries to the FAO-based Icelandic Responsible Fisheries Management (IRFM) Certification Programme. Certification was granted the 23rd of January 2015. 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) and a credibility position in the International marketplace and ensures that products certified under the Programme are identified at a recognised level of assurance. Demonstration of compliance is verified through a rigorous assessment by a competent, third party, accredited certification body, Global Trust. The assessment was conducted by a team of Global Trust appointed Assessors comprising of internal staff and externally contracted fishery experts. Details of the assessment team are provided in Appendix 1.

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

Since certification the Federation of Icelandic Fishing Vessel Owners (LÍÚ) and the Federation of Icelandic Fish Processing Plants (SF) have merged to form Fisheries Iceland. Additionally, the operation and management of the IRFM certification programme has passed from the Fisheries Association of Iceland (FAI) to the Iceland Responsible Fisheries Foundation (IRFF). The Iceland Responsible Fisheries Foundation, established in February 2011, owns and operates the brand of Iceland Responsible Fisheries.

This Assessment report comprises both the 2nd Surveillance Report for the Icelandic haddock commercial fisheries and additional criteria aimed at transitioning the fisheries from Version 1 Revision 1 (March, 2014) to Revision 2.0 (July, 2016) of the IRFM Standard**.** Therefore, this report monitors for any changes in the management regime, regulations and their implementation, stock assessment and status, and wider ecosystem considerations since the first surveillance assessment in October 2015 and additionally scores the management system against any new and/or modified criteria in Revision 2.0 of the IRFM Standard. Ultimately this assessment evaluates whether current practices in the management of the haddock fisheries; 1) remain consistent with the overall confidence ratings assigned during initial assessment of the fisheries against Version 1 Revision 1 of the IRFM Standard and 2) are consistent with any new or modified criteria in Revision 2.0 of the IRFM Standard. The assessment was conducted according to the Global Trust procedures for FAO-Based IRFM certification using Version 2.0 of the IRFM Standard (July 2016).

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

ii. Assessment Team Details

Sam Dignan, Lead Assessor
SAI Global/Global Trust Certification Ltd.
Quayside Business Centre,
Dundalk, Co. Louth,
Ireland.
T: +353 (0)42 9320912
E-mail: samuel.dignan@saiglobal.com

Dankert Skagen, MD, Assessor
Fisheries Science Consultant
Fjellveien 96, 5019 Bergen,
Norway
Website: www.dwsk.net

Gísli Svan Einarsson, Assessor
VERIÐ Vísindagarðar/Science Park
Háeyri 1
550 Sauðárkrókur
Website: www.veridehf.is

1. Introduction

This surveillance assessment of Icelandic haddock fulfills part of the procedure for the continuing 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 Surveillance Report comprises both the 2nd Surveillance Report for the Icelandic haddock commercial fisheries and additional criteria aimed at transitioning the fisheries from Version 1 Revision 1 (March, 2014) to Revision 2.0 (July, 2016) of the IRFM Standard**.** Therefore, this report monitors for any changes in the management regime, regulations and their implementation, stock assessment and status, and wider ecosystem considerations since the first surveillance assessment in June 2015 and additionally scores the management system against any new and/or modified criteria in Revision 2.0 of the IRFM Standard. Ultimately this assessment evaluates whether current practices in the management of the haddock fisheries; 1) remain consistent with the overall confidence ratings assigned during initial assessment of the fisheries against Version 1 Revision 1 of the IRFM Standard and 2) are consistent with any new or modified criteria in Revision 2.0 of the IRFM Standard.

The assessment was conducted according to the Global Trust procedures for FAO-Based IRFM certification using Revision 2.0 of the IRFM Standard (July 2016). The IRFM Standard is based on the 1995 FAO Code of Conduct for Responsible Fisheries and on the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries adopted in 2005 and amended/extended in 2009, which in turn are based on the current suite of agreed international instruments addressing fisheries. The Assessment is based on the 3 major Sections of responsible fisheries management, as outlined in Revision 2.0 of the IRFM Standard, including:

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

Additionally, all Clauses new to Revision 2.0 of the IRFM Standard, and therefore not previously assessed, have been evaluated in Appendix 2.

1.1. Recommendations of the Assessment Team

The assessment team recommends that the management system of the applicant fisheries, the Icelandic haddock (*Melanogrammus aeglefinus*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by demersal trawl, long-line, gill net, Danish seine net, and hook and line by small vessel gear and indirectly by Nephrops trawls, shrimp trawls, pelagic trawls and purse seines, are granted continued certification.

2. Fishery Applicant Details

Table 1. Fishery applicant details.

Applicant Contact Information	
Organisation/Company Name:	Fisheries Iceland (formerly the Federation of Icelandic Fishing Vessel Owners (LÍÚ) and the Federation of Icelandic Fish Processing Plants (SF))
Date:	8 February 2010
Correspondence Address:	Samtök fyrirtækja í sjávarútvegi (SFS)
Street:	Borgartún 35
City:	Reykjavík
Country:	Iceland
Postal Code:	
Phone:	(354) 591 0300
Web:	www.sfs.is
E-mail Address	info@sjavarutvegurinn.is
Organisation/Company Name:	The National Association of Small Boat Owners, Iceland (NASBO)
Date:	8th February 2010
Correspondence Address:	Landssamband smábátaeigenda
Street:	Hverfisgötu 105
City:	101 Reykjavik
Country:	Iceland
Postal Code:	IS-101
Phone:	(354) 552 7922
Web:	www.smabatar.is
E-mail Address:	ls@smabatar.is

3. Unit of Certification

Table 2. Unit of Certification.

	Fish Species (Common and Scientific Name)	Geographical Location of Fishery	Gear Type	Principal Management Authority
1	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Demersal trawl	Ministry of Industries and Innovation
2	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Long-line	Ministry of Industries and Innovation
3	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Danish Seine net	Ministry of Industries and Innovation
4	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Gill net	Ministry of Industries and Innovation
5	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Hook and line by small vessels	Ministry of Industries and Innovation
6	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Nephrops Trawl*	Ministry of Industries and Innovation
7	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Shrimp Trawl*	Ministry of Industries and Innovation
8	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Pelagic Trawl*	Ministry of Industries and Innovation
9	Haddock (*Melanogrammus aeglefinus*)	Iceland 200 mile EEZ	Purse seine*	Ministry of Industries and Innovation

*Indirect landings, very small percentage (<1% per gear)

4. Surveillance Meetings

Table 3. Surveillance meetings (August 2016).

Date	Time	Organisation	Present	Overview/Key Items Discussed
09/08/2016	09:00	Iceland Responsible Fisheries Foundation	Hrefna Karlsdóttir **Assessment Team**: Sam Dignan Dankert Skagen Gísli Svan Einarsson	▪ Review of the 2015/16 season. Known issues etc. ▪ Development of the IRFF Programme.
	10:30	Fisheries Iceland	Kristján Þórarinsson **Assessment Team**: Sam Dignan Dankert Skagen Gísli Svan Einarsson	▪ Review of the 2015/16 season. Known issues etc. ▪ Development of the IRFF Programme. ▪ Initiatives to improve the fishing industry in Iceland ▪ Ghost fishing. Recycling of old fishing gear and reporting of lost gear ▪ Conflict resolution in Icelandic fisheries
10/08/2016	10:00	Fisheries Directorate	Áslaug Eir Hólmgeirsdóttir Head of Surveillance Department Þorsteinn Hilmarsson, Head of Services and information **Assessment Team**: Sam Dignan Dankert Skagen Gísli Svan Einarsson	▪ Management, new organizational responsibilities, legislation ▪ Catch versus TAC for 2015/2016 season. ▪ TAC allocation for 2016/2017 season. ▪ TAC versus catch ▪ Landing in other nations. Foreign vessels fishing in Icelandic EEZ. ▪ Changes to quota allocation mechanisms ▪ Gear marking regulations ▪ Fora/mechanisms for conflict resolution (e.g. gear conflict, conflict between sectors etc.) ▪ Mechanisms to disseminate information to the public. ▪ Updates on international cooperation ▪ New gear restrictions/technical measures ▪ ETP species legislation in Iceland. ▪ Status of marine mammal populations, any updates
	13:00	Marine Research Institute	Sigurður Guðjónsson, Director General Guðmundur Þórðarson Head of Demersal Research Department **Assessment Team**: Sam Dignan Dankert Skagen Gísli Svan Einarsson	▪ Changes to the analytical assessments. ▪ Plans for development of assessment and HCR. ▪ Formal state of the FMP/HCR at present. ▪ Fishery on the stock outside the Icelandic EEZ - shifts in distribution ▪ Concordance between TAC and catch. ▪ Bycatch/Habitats/ETP. ▪ Updates on mapping the distribution of benthic assemblages and habitats in Icelandic waters ▪ Interactions with ETP or depleted/low abundance species in Icelandic waters. Recent updates on the status of common skate, Atlantic halibut, Greenland shark, spiny dogfish and Atlantic wolfish ▪ Marine mammals. Porpoise and seal numbers latest updates. ▪ Logbook reporting of marine mammal and seabird bycatch. Comparisons of observer and self-reported data.

				▪ New coral and hydrothermal vent closures implemented in the last 12 months.
11/08/2016	10:00	Small Boat Owners	Halldór Ármannsson **Assessment Team**: Sam Dignan Dankert Skagen Gísli Svan Einarsson	▪ Coastal fisheries in 2015/2016 season ▪ Changes to management of small boat fisheries, allocations etc. ▪ NASBO fished quota (Is quota being utilised/overshoot?)
	13:30	Coastguard	Björgólfur H. Ingason Chief Controller Auðunn Kristinsson Deputy Chief of Operation **Assessment Team**: Sam Dignan Dankert Skagen Gísli Svan Einarsson	▪ Enforcement Laws and Regulations. Amendments or changes to the Icelandic enforcement laws ▪ Boardings and violations (as well as type) have been carried out by the ICG during 2015/2016 ▪ Type of vessels boarded ▪ Foreign vessels boarded. ▪ Significant violations which undermined directly the management of the Icelandic fisheries? ▪ Prosecutions and reprimands against skippers/vessels ▪ Changes in 2015/2016 in the systems or patrolling vessels used for enforcement ▪ Small RIB available again (RIB was out for majority of season prior to Surveillance 1) ▪ Enforcement of gear marking regulations ▪ Enforcement of legislation regarding ETP species ▪ Enforcement of logbook reporting requirements

5. Assessment Outcome Summary

5.1. Fishery Management

Iceland has a well-established marine policy, specified in legislation, on the structure of fisheries management and in practical implementation. The Ministry of Industries and Innovation is the principal management organization responsible for Icelandic fisheries. The Directorate of Fisheries is responsible for the implementation of Fishery Regulations on behalf of the Ministry. The Icelandic Coast Guard performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters, and monitoring of fishing within the zone in consultation with the Marine Research Institute and Ministry of Industries and Innovation. The Marine Research Institute conducts a wide range of marine research and provides the Ministry with scientific advice. The stock is managed according to a management plan that has been approved by ICES. The main management measures include TACs in an ITQ system, area closures to protect undersized fish and mesh size regulations.

The assessment of Icelandic haddock has since 2007 been conducted with an Adapt type model tuned with both the spring and autumn bottom trawl surveys. The assessment is consistent from year to year and has been benchmarked and approved by ICES. Catch numbers at age are obtained by combining landings statistics with samples from the landings, obtained through an organized sampling regime. The assessment is done within ICES by the North-Western Working Group (NWWG). International review is through ICES. Iceland also has a broad international cooperation on matters relevant to the fishery in several other organisations.

The Minister of Fisheries and Agriculture determines the Total Allowable Catch (TAC) of haddock for each fishing season (September to August) in accordance to law (Fisheries Management Act 116), based on the advice from the MRI. The MRI advice is based on work and advice by ICES and on the management plan for haddock.

Within the fishery management plan, there is a harvest rule that has been found to be according to the precautionary approach by ICES. The plan has a limit and a trigger biomass (equal to the limit) and a target harvest rate. Other reference points are considered redundant. The biomass limit reference point B_{lim} = 45,000 t as defined by ICES is the lowest observed biomass (in 1987 as estimated in 2010) in the years covered by the assessment. There are no indications of recruitment failure but the recruitment dynamics are unknown below this level of SSB. ICES notes that the HR (catch as fraction of the biomass of haddock > 45cm) corresponding to MSY is 0.52, while in order to keep the annual probability of SSB > B_{lim} above 5%, the HR should be below 0.46. Accordingly, a precautionary harvest rate was set at 0.46. The HR in the rule is below both these. A target biomass has not been defined, as the primary management tool is a harvest rate, which should lead to near maximum catches in the long term. A limit fishing mortality is considered redundant as the existing rules, together with strong mechanisms for implementation and enforcement, are regarded as sufficient to protect against overfishing.

ICES has recently defined additional reference points that are not used in management as their functionality is covered by the harvest rule; these additional reference points do not conflict with the current haddock FMP. With the current rule and stock dynamics, the probability of reaching the trigger or limit biomass is low. If the biomass drops below the trigger, rebuilding will be facilitated by a reduced harvest rate.

Haddock in Icelandic waters is considered as a local stock with some thoughts that it is not able to cross the deep waters surrounding the Icelandic shelf. There is an extensive system of closures to protect spawning grounds. While these closures are primarily for cod, haddock have largely the same spatial and temporal spawning patterns as cod; thus the closed areas for cod likely have a substantial effect on spawning haddock as well. To avoid catching undersized fish and to reduce potential incentives relating to discarding, there are a number of measures in place including permanent and temporary spatial closures, mesh size regulations and special arrangements for payment for landing undersized haddock.

5.2. Compliance and Monitoring

An effective legal and administrative framework has been established through various fisheries management acts. Compliance is ensured through strict monitoring, control and enforcement carried out by the Directorate and the Icelandic Coastguard.

Vessels must weigh catch within two hours of landing on the quay. The system is developed to standardize weights and tares for ice and tubs (a standard tub is used throughout Iceland for fresh fish that 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. Weighed recorded landings are the main source of catch documentation. Logbook data is used as a secondary source to cross check landings. 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 Icelandic Coastguard administers the VMS for all Icelandic vessels and for all foreign vessels (including fishing vessels) that enter Icelandic waters. There is an integrated system for monitoring, control and surveillance (MCS) in Iceland. The Icelandic Coastguard administers the VMS for all Icelandic vessels and for all foreign vessels (including fishing vessels) that enter Icelandic waters as part of an integrated monitoring, control and surveillance (MCS) system. The purposes of the MCS system are numerous including maritime traffic control, marine search and rescue and fisheries enforcement. The importance of the fisheries sector to the Icelandic economy and the need for greater efficiency, due to the relatively small size of the institutions involved, has led to high levels of collaboration and integration resulting in creative and dedicated approaches to fisheries management and enforcement. The fisheries MCS system in Iceland has at its core the effective use of available technology meaning relatively small staff numbers are able to achieve extensive monitoring of the Icelandic fishing industry.

In order to facilitate the matching of the species composition of the catch and the quota portfolio for individual fishing vessels or companies, and also to reduce incentives for discard, a variety of flexibility provisions are in place. Current quota share, allocation and remaining quota can be obtained from the Directorates website for any vessels. The system is very transparent. Rules are enforced by the Directorate and the MRI. There are penalties for serious infractions.

Catch analysis includes the comparison of catch amount with figures for the amounts of sold or exported products in order to ensure independent checking of the accuracy of information about the fish that is brought ashore. If analysis reveals discrepancies between the information stated in the reports and the information received from the harbour weighing, corrective measures are taken as appropriate.

5.3. Ecosystem considerations

Adverse impacts of the fishery on the ecosystem (e.g. bycatch, ETP species interactions and habitat and food web interactions) are considered, appropriately assessed and effectively addressed. Gathering knowledge of the marine ecosystem is a key role that has been assigned to the Marine Research Institute. There is also comprehensive research which forms the basis of the fisheries management implemented in Iceland to harvest the stocks in a responsible manner, in order to ensure and maintain maximum long-term productivity of all marine resources. The MRI monitors and researches the marine environment, including the ecosystem components.

Information is available on fishing gear used in the fishery, including 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. Discarding, including discarding of catches from non-target commercial stocks, is prohibited. Non-target catches, including discards, of stocks other than the “stock under consideration“, do not pose serious risks of depletion to these stocks.

The Icelandic authorities have implemented an extensive array of areal closures within the Icelandic EEZ. These include permanent, seasonal and periodic closures aimed at protecting both juvenile and spawning fish and are gear or fishery specific. 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. While the majority of temporary closures to protect juveniles are aimed at protecting cod, haddock and saithe, these closures are also likely to have a conservation benefit for other species.

The MRI has studied haddock, and its place in the ecosystem. Haddock are not a key prey species but a major predator, and the magnitude of the cod stock is likely to have an inverse impact on capelin, herring and shrimp stocks. Icelandic government policy exists to protect vulnerable marine ecosystems (VMEs; cold-water corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Legislation provides for the prohibition of fishing activities with bottom-contacting gear to especially protect vulnerable benthic habitats.

6. Conformity statement

The assessment team recommends that the management system of the applicant fisheries, the Icelandic haddock (*Melanogrammus aeglefinus*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by demersal trawl, long-line, gill net, Danish seine net, and hook and line by small vessel gear and indirectly by Nephrops trawls, shrimp trawls, pelagic trawls and purse seines, are granted continued certification.

7. Conformance Criteria Fundamental Clauses for Surveillance Reporting

7.1. Section 1: Fishery Management

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

Supporting Clauses:	1.1.1, 1.1.2, 1.1.3, 1.1.4, **1.1.5, 1.1.6**, 1.1.7, 1.1.8 and sub-clauses, 1.1.9 and sub-clauses, 1.1.10 and sub-clauses			
Important Note:	Clause 1.1.5 and Clause 1.1.6 are new to IRFM Standard Revision 2.0 and are scored separately in Appendix 2. Text added to 1.1.10.5 in IRFM Standard Revision 2.0: ***"…and relevant authorities."*** Clause 1.1.10.5 (minor change) – wording change only no change to intent of Clause.			
Clause Guidance:	***There shall be a structured and effective fisheries management system, with objectives including the limiting of total annual catches for the stock under consideration. Accordingly, appropriate management measures for the conservation and management of the stock shall be adopted and effectively implemented by the competent authorities. Fishing for the "stock under consideration "shall be managed by the competent authorities in accordance with a documented and publicly available Fisheries Management Plan.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Iceland has a well-established marine policy, specified in legislation, on the structure of fisheries management and in practical implementation. The Ministry of Industries and Innovation is the principal management organization responsible for Icelandic fisheries. The Directorate of Fisheries is responsible for the implementation of Fishery Regulations on behalf of the Ministry. The Icelandic Coast Guard performs sea and air patrols of Iceland's 200-mile exclusive economic zone and 12-mile territorial waters, and monitoring of fishing within the zone in consultation with the Marine Research Institute and Ministry of Industries and Innovation. The Marine Research Institute conducts a wide range of marine research and provides the Ministry with scientific advice. The stock is managed according to a management plan, approved by ICES. The main management measures include TACs in an ITQ system, area closures to protect undersized and spawning fish and mesh size regulations.

EVIDENCE

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

There is a structured fisheries management system adopted within Iceland for the management of fish species including haddock[2]. There are a number of inter-related government agencies within the system under the direction of the Ministry of Industries and Innovation which has ultimate responsibility. Policies incorporate a number of International Agreements, including; UN Convention of the Law of the Sea, Agenda

[1] https://eng.atvinnuvegaraduneyti.is/laws-and-regulations/fisheries/
[2] http://www.responsiblefisheries.is/seafood-industry/management-and-control-system/

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[3].

The Ministry of Industries and Innovation has the ultimate responsibility for fisheries management. They act according to law issued by the parliament (Alþingi), and according to advice from the Marine Research Institute (MRI). The executive body is the Fisheries Directorate (Fiskistofa)[4]. The coast guard is responsible for control at sea, both of the catches and the quality of the vessels.

The Ministry of Industries and Innovation[5] in Iceland is the principal management organization responsible for Icelandic fisheries. Overall responsibilities include:

- Fisheries Management
- Research, conservation and utilization of fish stocks, other living marine resources of the ocean and the seabed and management of areas where these resources can be harvested
- Research and control of production and import of fisheries products
- Mariculture of marine species
- Supporting the research, development and innovation in the fisheries sector

Limiting the total annual catch of haddock is achieved primarily by an annual TAC. This TAC is distributed on vessels as individual transferable quotas (ITQ), managed by the Directorate.

In addition, there are area closures (temporary and permanent), and gear restrictions in place. There is extensive control and monitoring of landings. Discards are prohibited, and studies by MRI indicate that discards are negligible. Management also includes fora for consultation with stakeholders. The Ministry sets the overall TAC for each species. The TAC is set taking advice from MRI, which is responsible for collecting and analysing scientific data on the stock. The MRI advice is based on calculations done within the framework of ICES (The International Council for Exploration of the Sea) ICES provides advice, which normally, but not necessarily is followed by MRI and subsequently by the Ministry. The ministry also seeks advice from ICES on management plans. The management plan for haddock was examined and approved by ICES in 2009 and revisited in 2013[6].

The Directorate of Fisheries (Fiskistofa)[7] has recently moved its HQ to Akureyri. It has 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

[3] http://www.fisheries.is/management/government-policy/responsible-fisheries/
[4] http://www.fiskistofa.is/
[5] http://eng.atvinnuvegaraduneyti.is/
[6] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/Special%20requests/Iceland%20longterm%20MP%20for%20Icelandic%20haddock.pdf
[7] http://www.fiskistofa.is/

All catches of Icelandic fishing vessels must be weighed and recorded at the port of landing by a certified official weigher. The port authorities record the catch in a computer that is directly linked to a centrally located database at the Directorate of Fisheries. Thus 60 ports in Iceland send electronic data daily to the Directorate. A total of approximately 50,000 landings are registered in the system every year. The data is processed in the Directorate´s database and catches are subtracted from the vessel´s quotas. The system is designed so that the Directorate can act quickly if vessels have overfished their quotas. Excess catches can result in a revocation of fishing licenses and fines. Statistics Iceland then receive copies of the data for the production of statistics regarding the economy.

The Icelandic Coast Guard[8]

The Coast Guard performs sea and air patrols of Iceland's 200 mile exclusive economic zone and 12 mile territorial waters, and monitoring of fishing within the zone in consultation with the Marine Research Institute and Ministry of Industries and Innovation. In addition to patrolling the Icelandic EEZ, the Coast Guard performs surveillance and inspection duties in international areas, e.g. the NEAFC Regulatory Area which is the area outside the EEZ towards the south, 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 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 Coast Guard also undertake all hydrographic surveys in Icelandic waters, including the preparation of nautical charts. In 2011 the Coast Guard received a new flagship vessel named Thor that became active in November. Thor was specially designed for Icelandic conditions, particularly for protection of resources, fisheries monitoring, law enforcement and search & rescue. The ship was designed for the rescue and salvaging of much larger ships (which are expected to start traversing the Arctic as sea ice melts).

[8] http://www.lhg.is/english/icg/

Clause 1.2 – Research and Assessment

Supporting Clauses:	1.2.1, 1.2.2, 1.2.3, 1.2.4 and sub-clauses, 1.2.5, 1.2.6, 1.2.7			
Important Note:	Clause 1.2.1: Text added (**Bold**) in IRFM Standard Revision 2.0: "*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."*** Minor change – Dissemination of research results addressed specifically below.			
Clause Guidance:	***The relevant data collected/compiled by the relevant authorities shall be appropriate to the chosen method of stock assessment and sufficient for its execution, in line with assessing the size and/or productivity of the fish stock(s) under consideration. The determination of suitable conservation and management measures shall include or take account of total fishing mortality from all sources (including discards, incidental mortality and catches in other fisheries). Furthermore, there shall be active collaboration with international scientific organizations for stock assessment activities and review, and, in cases where the stock under consideration is a shared stock or a straddling stock or a highly migratory stock, there shall be scientific cooperation at the relevant bilateral, regional or international level for obtaining data and/or conducting stock assessments and/or providing advice, as appropriate.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The assessment of Icelandic haddock has since 2007 been conducted with an Adapt type model tuned with both the spring and autumn bottom trawl surveys. The assessment is consistent from year to year and has been benchmarked and approved by ICES. Catch numbers at age are obtained by combining landings statistics with samples from the landings, obtained through an organized sampling regime. The assessment is done within ICES by the North-Western Working Group, with a method that was developed by MRI and recently approved in a benchmark by ICES. International review is through ICES. Iceland also has a broad international cooperation on matters relevant to the fishery in several other organisations.

EVIDENCE

Assessment method

The assessment of Icelandic haddock has since 2007 been conducted with an Adapt type model tuned with both the spring and autumn bottom trawl surveys. The assessment is consistent from year to year (Figure 1).

The assessment method was benchmarked and approved by ICES in 2013[9].

[9] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKROUND/WKROUND%20Report%202013.pdf

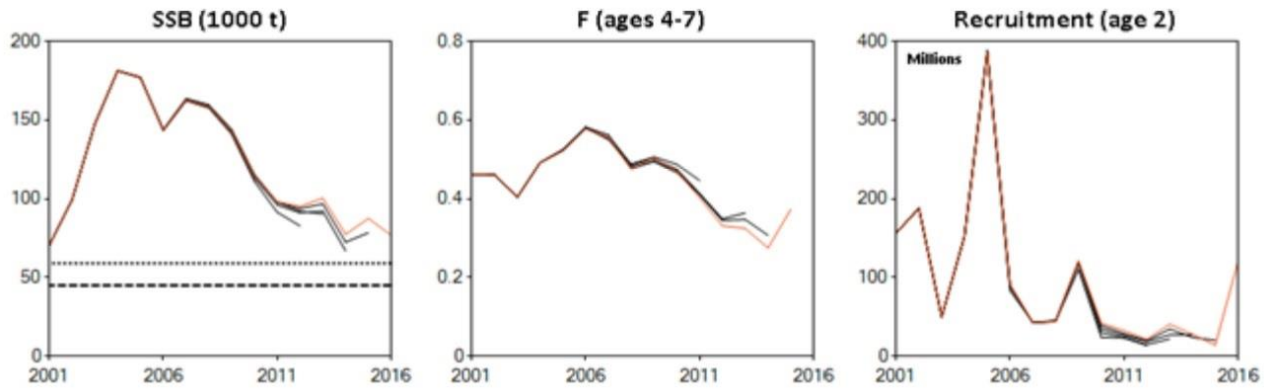

Figure 1. Haddock in Division 5a. Historical assessment results (final-year recruitment and SSB values included) (Source: ICES 2016[10]).

Catch data

Catch data in numbers at age are obtained by combining landings data with age distributions from samples. The vast majority (97 – 98% in recent years) of haddock catches are taken by Icelandic vessels in Icelandic waters, the remainder is taken by Faroese vessels. Haddock is caught all around Iceland, but mostly in the South, except in warm years where substantial catches are also taken in the North, like in 2015 (Figure 2).

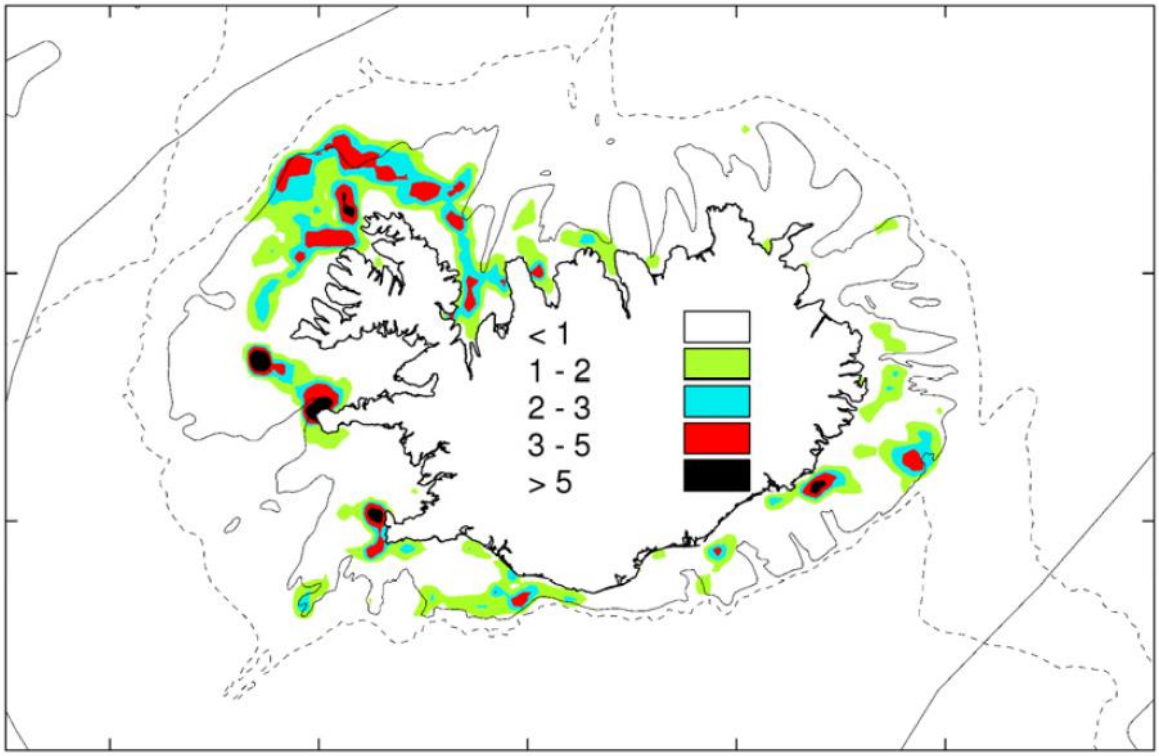

Figure 2. Haddock fishing grounds in 2015 (t/nm^2) (Source: MRI 2016[11]).

Haddock is caught by trawl and longline, and to a lesser extent by Danish seine. The contribution by long line has increased over the years (Figure 3).

[10] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-iceg.pdf
[11] http://www.hafro.is/Astand/2016/ysa_2016.pdf

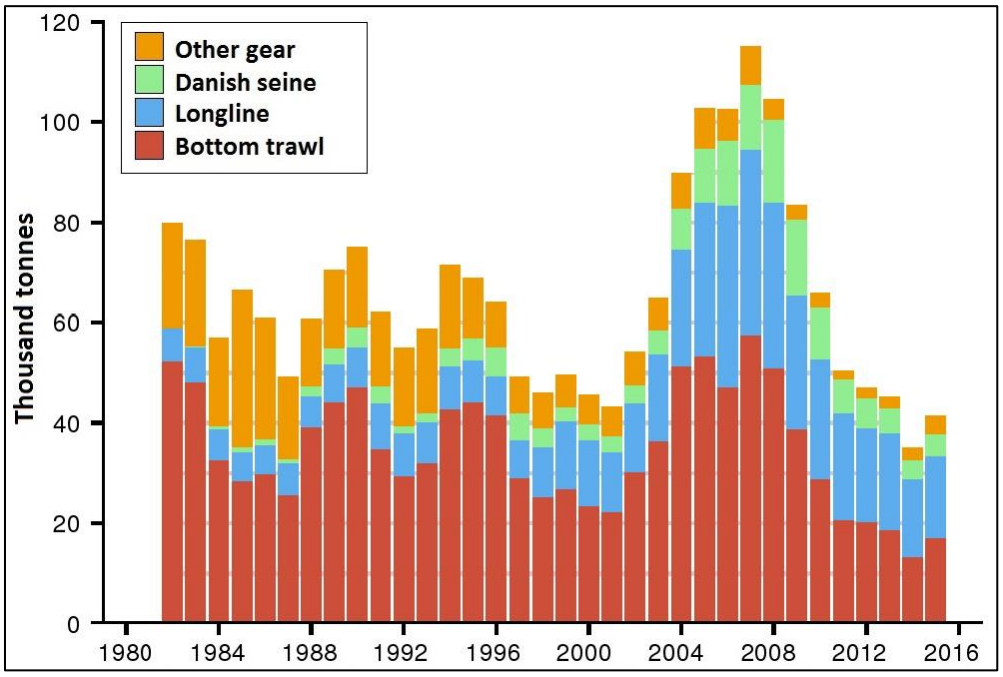

Figure 3. Catches of haddock by gear type (Source: MRI 2016[12]).

Landings Data

Landings in Iceland are restricted to authorised ports where the amounts landed are recorded by certified weighers. The landings data are managed by the Directorate of Fisheries and used as catch data in the assessment. The estimates by the Directorate of Fisheries are based on full census of weighting of fish on the dock when landed or in fish processing factories prior to processing. Information on the landings of each trip are stored in a centralised database of which the Marine Research Institutes (MRI) employees have full access. Discarding is prohibited[13] and is regularly monitored by comparing size distributions in self-reported catches and those taken by onboard inspectors. Studies by MRI indicate that discards of haddock are negligible (<0.5% by number since 2011 - last estimate in 2013)[14].

Nearly all haddock is landed gutted and converted to ungutted using the conversion factor 0.84. The real gutting factor is on the average lower so the amount of haddock landed is overestimated. This is regarded as a minor problem as the error is cancelled out in the advice[15].

Biological sampling of catches

MRI has extensive sampling programs, both at sea and from landings, and partly in cooperation with inspectors from the Directorate. For each species, each fleet/gear and each landing strata there is a specific target of landings value; once the cumulative daily landings value pass the target value an automatic request is made to the sampling team for a sample to be taken.

Catch numbers-at-age are calculated using length distributions and age-length keys. Weights at age are calculated from standardized weight-length relationships. The method has remained consistent for many years

[12] http://www.hafro.is/Astand/2016/ysa_2016.pdf
[13] 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
[14] http://www.hafro.is/Bokasafn/Timarit/fjolrit-183.pdf
[15] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKROUND/WKROUND%20Report%202013.pdf, p. 181

Survey data

Iceland conducts two extensive bottom trawl surveys that are used in most assessments of demersal fish in Icelandic waters, a spring groundfish survey and an autumn groundfish survey both covering the whole Icelandic EEZ. These surveys are more extensive than most surveys that are used for routine assessments (530 stations in the spring survey, 380 stations in the autumn survey), see map below showing all hauls in the scientific surveys in 2013 (Figure 4). There are only minor changes from year to year in the coverage. An extensive survey protocol is available[16]. Both surveys are used for the assessment of haddock.

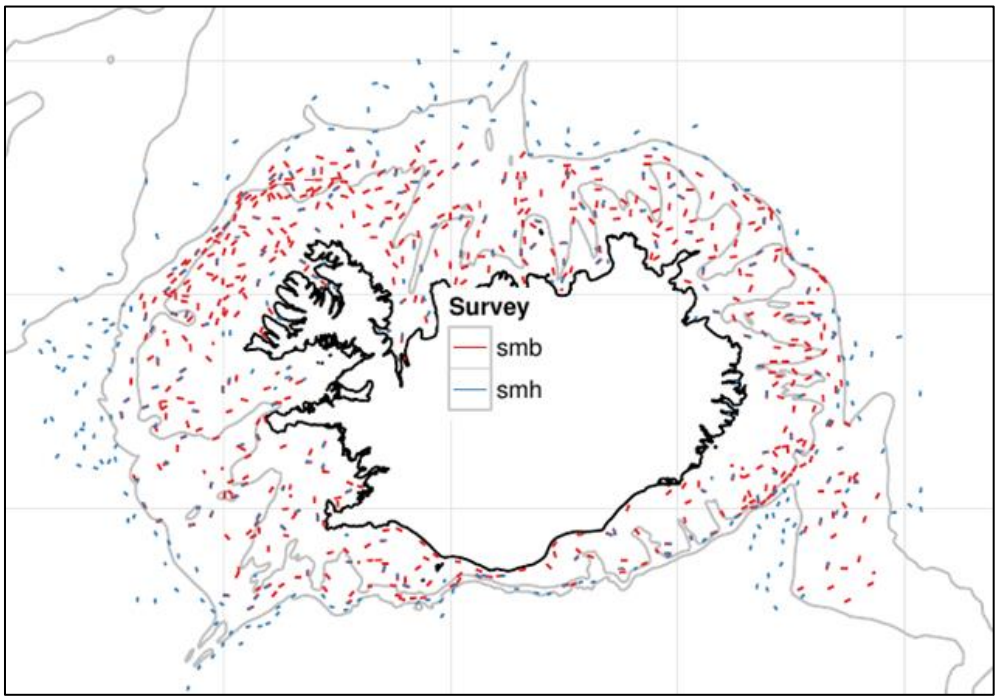

Figure 4. Stations in the bottom trawl surveys (all hauls in the 2013 scientific surveys) Red: Spring survey. Blue: Autumn survey (Source: ICES 2015[17]).

Conservation and management measures

A Harvest Control Rule has been developed for the annual TAC for Icelandic haddock, and has been implemented since 2013[18]. ICES evaluated the Iceland haddock management plan in 2013. ICES concluded that the harvest control rule for Icelandic haddock in the request is precautionary and in accordance with the ICES MSY approach[19].

International cooperation and review

The assessment is conducted by the ICES North-Western Working Group, where stakeholder nations participate. The assessment method was approved by ICES at a benchmark-process in 2013[20]. ICES advices on catches based on the assessment of the NWWG. The harvest rule in the current management plan was evaluated and approved by ICES in 2013.

[16] http://www.hafro.is/Bokasafn/Timarit/fjolrit-156.pdf

[17] WD17 (pp 259-313) in ICES. 2015: Report of the Benchmark Workshop on Icelandic Stocks (WKICE), 26–30 January 2015, Copenhagen, Denmark. ICES CM 2015/ACOM:31. 325 pp: http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2015/WKICE%202015/wkice_2015_final.pdf

[18] http://www.fisheries.is/main-species/codfishes/haddock/management-plan/

[19] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/Special%20requests/Iceland%20longterm%20MP%20for%20Icelandic%20haddock.pdf

[20] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKROUND/WKROUND%20Report%202013.pdf

Iceland has broad international scientific cooperation through organisations such as the Northeast Atlantic Fisheries Commission (NEAFC), the Northwest Atlantic Fisheries Organization (NAFO), and the North Atlantic Marine Mammal Commission (NAMMCO). Icelandic scientists have been involved in many international projects arranged by these organizations and in co-operative projects with research institutes and universities[21].

Research results are made public in a timely and readily understood fashion

The assessment is done by the ICES North-Western Working Group (NWWG)[22]. ICES provides advice based on the results from NWWG[23]. Once released, the advice and the NWWG report are available at the ICES website. The final advice to Icelandic authorities is provided by MRI. The MRI advice follows the advice for ICES unless there is good reasons to deviate from it. MRI provides an overview of the state and the advice for all major Icelandic stocks on its website[24].

[21] http://www.fisheries.is/management/research/

[22] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2016/NWWG/12%20NWWG%20Report%20-%20Sec%2010%20Icelandic%20haddock.pdf

[23] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-iceg.pdf

[24] For haddock: http://www.hafro.is/Astand/2016/ysa_2016.pdf

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

Clause 1.3.1 – The Precautionary Approach

Supporting Clauses:	1.3.1.1, 1.3.1.2, 1.3.1.3, 1.3.1.4, 1.3.1.5, 1.3.1.6			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***The precautionary approach shall be implemented, as specified in the Fisheries Management Plan, to effectively protect the stock under consideration. Accordingly, relevant uncertainties shall be taken into account through a suitable method of risk assessment, appropriate reference points shall be determined, relevant uncertainties shall be taken into account through a suitable method of risk assessment, and specified remedial actions shall be taken if reference points are approached or exceeded.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

A limit reference point is defined for the spawning stock biomass. There is a harvest rule in place that has been found to be according to the precautionary approach by ICES. The plan has a limit and a trigger biomass (equal to the limit) and a target harvest rate.

EVIDENCE

ICES has defined precautionary reference points, as well as reference point related to MSY[25]. The current reference points are presented in Table 4 below.

Table 4. Haddock in Division 5a. Reference points, values and their technical basis (ICES, 2016).

Framework	Reference point	Value	Technical basis
MSY approach	MSY $B_{trigger}$	Not defined	
	F_{MSY}	Not defined	
	HR_{MSY}	0.52	Stochastic simulations
Precautionary approach	B_{lim}	45 000 t	B_{loss}
	B_{pa}	59 000 t	$B_{lim}e^{1.645 \times 0.16}$
	HR_{lim}	Not defined	
	F_{pa}	Not defined	
	HR_{pa}	0.46	Stochastic simulations
Management plan	MGT $B_{trigger}$	45 000 t	Stochastic simulations
	F_{MGT}	Not defined	
	HR_{MGT}	0.40	Management plan

The biomass limit reference point (B_{lim}) is based on the lowest observed biomass (B_{loss}), as is common practise when there is no clear relation between SSB and recruitment (Figure 5).

[25] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-iceg.pdf

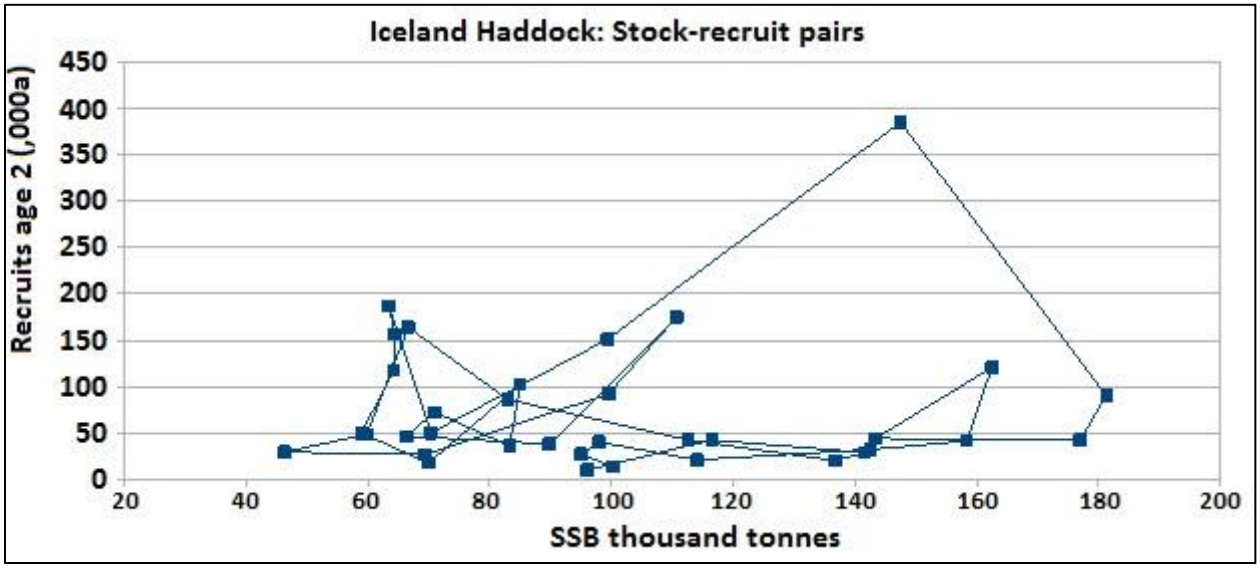

Figure 5. Spawning stock biomass and corresponding recruitment at age 2 (Source: ICES 2016).

B_{lim} was set at 45,000 t which was the SSB in 1987, according to the 2012 assessment; the most recent assessment has a slightly higher value for SSB_{1987} of 46,300 t. The trigger point in the harvest rule is set equal to B_{lim}. This is intended as an extra precaution, as the probability of reaching B_{lim} is estimated to be very low with the management plan. Reducing the harvest rate only when SSB is below B_{lim} was deliberate, with a relatively low harvest rate being preferred to a higher but frequently changing harvest rate[26]. A precautionary biomass reference point (B_{pa}) was set by ICES in 2016, but has no impact on the management as the management plan does not prescribe any particular action if that level is passed. It was set according to ICES standard practise as a safety margin around the limit reference point, assuming a CV of 16% on the assessment biomass

There is no mortality limit points, as the mortality is constrained by the target harvest rate in the management plan. An MSY harvest rate has been calculated, which is higher than the target in the plan.

The precautionary approach is implemented through the harvest rule in the management plan. The plan has a standard harvest rate of 40% of the biomass of haddock >45cm which will be reduced if the SSB falls below a trigger biomass that is equal to the limit. The HR in the rule is below both HR_{MSY} and HR_{pa}. The reduction of HR below the limit biomass will facilitate rebuilding if the SSB should fall below the limit. According to the evaluation of the plan, reaching the trigger (and the limit) is unlikely (<5% probability) unless stock dynamics change or fishing effort becomes out of control.

[26] Communicated at site visit at MRI 13/8/2014

Clause 1.3.2 – Management targets and limits

Clause 1.3.2.1 – Harvesting rate and fishing mortality

Supporting Clauses:	1.3.2.1.1, 1.3.2.1.2			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***The management target for fishing mortality (or its proxy) and the associated limit reference point, as well as the management action to be taken when the limit reference point is exceeded, shall be stated in the Fisheries Management Plan. If fishing mortality (or its proxy) is above the limit reference point, management actions shall be taken to decrease the fishing mortality (or its proxy) below the limit reference point.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The management plan has a target harvest rate, a trigger biomass and a rule to reduce the harvest rate if SSB falls below the trigger biomass. A limit fishing mortality is considered redundant as the existing rules, together with strong mechanisms for implementation and enforcement, are regarded as sufficient to protect against overfishing.

EVIDENCE

There is a target harvest rate (40% of the biomass of haddock >45cm) in the management plan, which is a proxy for fishing mortality. This harvest rate is associated with a low (<5%) probability of bringing the spawning biomass below the limit level of 45,000 t. There is a trigger SSB below which the harvest rate will be reduced. The trigger was set equal to the limit, which implies that the reduction below the trigger will have no influence on the risk of reaching the limit, but will facilitate recovery should the limit be reached. This arrangement was deliberate with a relatively low harvest rate being preferred to a higher but frequently changing harvest rate[27].

No limit fishing mortality or harvest rate has been defined in the plan. It was considered redundant as target harvest rate in the harvest rule is associated with a low probability of reaching the limit biomass. The harvest rate corresponding to MSY is 52% and the harvest rate with a 5% risk of reaching the limit biomass is 46%; the latter is defined by ICES as a HR_{pa}. The additional rule, by which the harvest rate is to be reduced if the SSB goes below the trigger biomass, adds to the protection of the stock by facilitating recovery should the stock biomass drop below the limit. In addition there are supportive measures (area closures, gear restrictions, discard ban, strict landings control and control at sea) that contribute to keeping exploitation under control.

[27] Communicated at site visit at MRI 13/8/2014

Clause 1.3.2.2 – Stock biomass

Supporting Clauses:	1.3.2.2.1, 1.3.2.2.2, 1.3.2.2.3, 1.3.2.2.4			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***The long term management target for stock size (biomass), either explicit or implicit depending on management approach, and limit reference points consistent with the objective of promoting optimum utilization, shall be specified. Furthermore, limits or directions for stock size (or its proxy), consistent with avoiding recruitment overfishing shall be specified and should the estimated stock size approach B_{lim} (or its proxy), then appropriate management action shall be taken with the objective of restoring stock size to levels above B_{lim} (or its proxy) with high probability within a reasonable time frame.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The harvest rule in the management plan has a limit biomass defined. The limit also acts as a trigger biomass, below which the exploitation will be reduced. With the current rule and stock dynamics, the probability of reaching the trigger or limit biomass is low. If the biomass drops below the trigger, which is equal to the limit, rebuilding will be facilitated by a reduced harvest rate. In addition, there is the legal framework and a suite of control measures available to management to take further action If needed. A target biomass has not been defined, as the primary management tool is a harvest rate, which should lead to near maximum catches in the long term.

EVIDENCE

The management plan has the objective of ensuring, with high probability, a spawning biomass above the limit point of 45,000 t; this is the lowest biomass in the assessed time series, and there are no indications that recruitment is impaired at that stock abundance.

A long term target biomass has not been defined, and may be redundant as it has been demonstrated that the harvest rate in the management plan should lead to a yield near the maximum (Figure 6).

If the biomass drops below the trigger, which is close to the limit, rebuilding will be facilitated by a reduced harvest rate. Rebuilding the stock to above the limit if that is exceeded has not been extensively tested in the simulations done, and how rapidly the stock can be restored depends on the cause of the depletion. With the current biological properties of the stock, reaching B_{lim} with the agreed harvest rate is highly unlikely. If needed, there is the legal framework and a suite of control measures available to management to take further action.

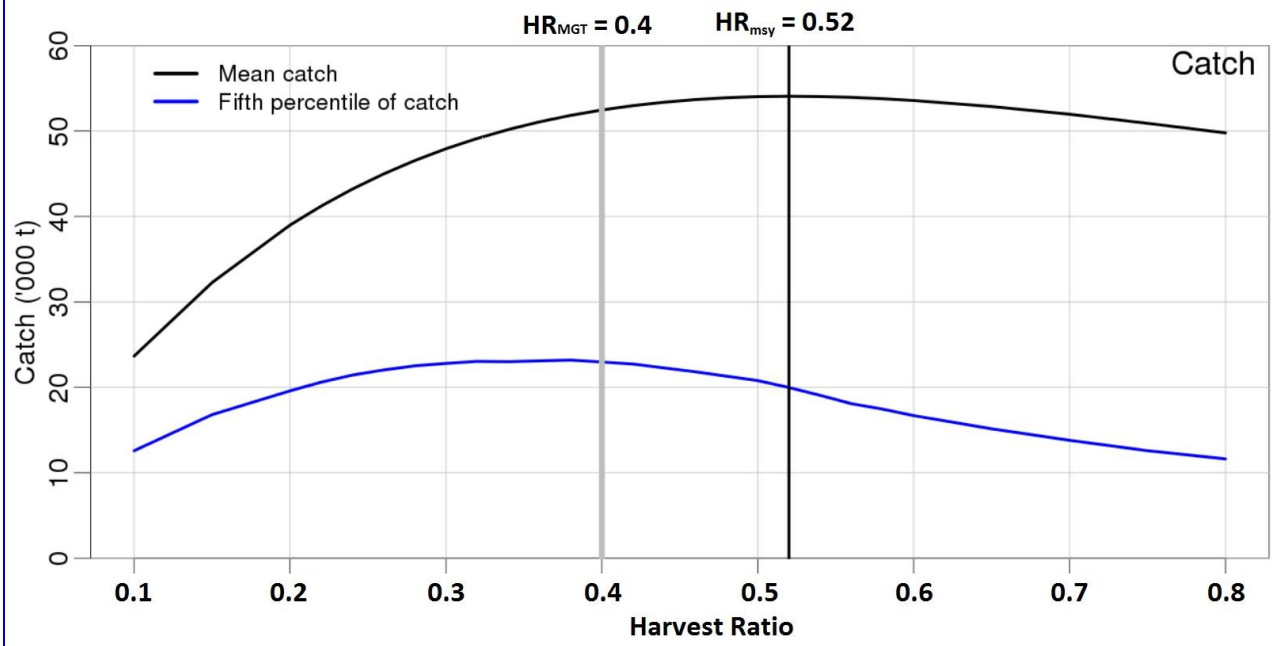

Figure 6. Yield as function of the harvest rate, for the management plan for Icelandic haddock. Copied from: ICES response to the Request from Iceland to ICES to evaluate the long-term management plan and harvest control rule for Icelandic haddock (Source: Modified from ICES 2013[28]).

[28] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/Special%20requests/Iceland%20longterm%20MP%20for%20Icelandic%20haddock.pdf

Clause 1.3.2.3 – Stock biology and life-cycle (Structure and resilience)

Supporting Clauses:	1.3.2.3.1, 1.3.2.3.2, 1.3.2.3.3			
Important Note:	Old Clause 1.3.2.3.3 removed from Standard in IRFM Standard Revision 2.0.			
Clause Guidance:	***Information on the biology, life-cycle and structure of the stock shall be taken into account and 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}). Relevant gear selectivity properties for the protection of juvenile fish shall be specified, as appropriate. Consideration shall also be given to measures designed to limit fishing mortality of juvenile fish, e.g. through temporary closures to fishing of areas containing a high proportion of juveniles of stock under consideration, with the objective of reducing the likelihood of growth overfishing and increasing the contribution of year classes to the spawning stock.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Haddock in Icelandic waters is considered as a local stock with some thoughts that it is not able to cross the deep waters surrounding the Icelandic shelf[29].

There is an extensive system of closures to protect spawning grounds. While these closures are primarily for cod, haddock have largely the same spatial and temporal spawning patterns as cod; thus the closed areas for cod likely have a substantial effect on spawning haddock as well. To avoid catching undersized fish and to reduce potential incentives relating to discarding, there are a number of measures in place including permanent and temporary spatial closures, mesh size regulations and special arrangements for payment for landing undersized haddock.

EVIDENCE

Haddock in Icelandic waters are considered as a local stock with a distribution confined to the Icelandic shelf.

There are no indications of diversity in stock structure although this has not been extensively studied. Balancing the fishery between sub-stocks has so far not been an issue, since there is nothing to indicate that such sub-stocks exist. Haddock can be found all around Iceland, although it is sparse in Northern areas except in warm years.

There is an extensive system of areal closures (Figure 7 and Figure 8) that to a large extent are designed to avoid exploitation of cod at the spawning grounds in the spawning season. While these closures are primarily for cod, cod and haddock have largely the same spatial and temporal spawning patterns; thus the closed areas for cod likely have a substantial effect on spawning haddock as well. Some closures are permanent or regular, but areas can also be temporarily closed at short notice, in particular if concentrations of juveniles are detected. Furthermore, there are mesh size regulations in place to protect juveniles; the standard mesh size in trawl is 155 mm (135 mm without a Polish cover). If undersized fish are caught, they have to be landed. Special rules apply for payment to encourage landing, but discourage catching of undersized fish.

[29] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/NWWG/Annex%2002%20Stock%20Annexes.pdf

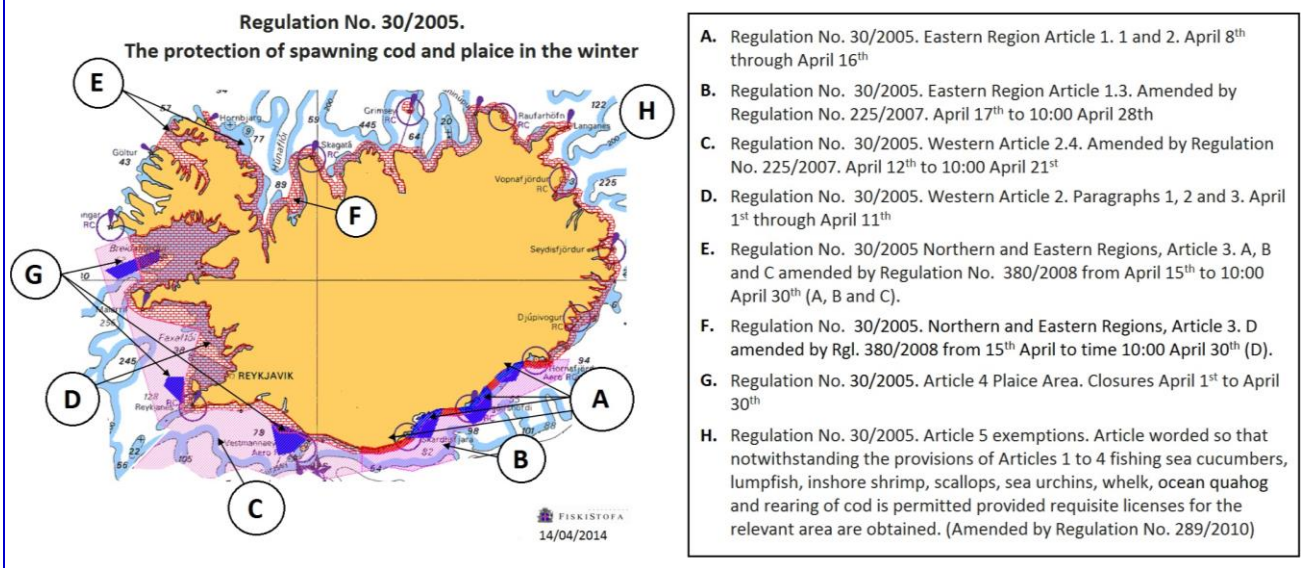

Figure 7. Permanent closures to protect spawning grounds[30].

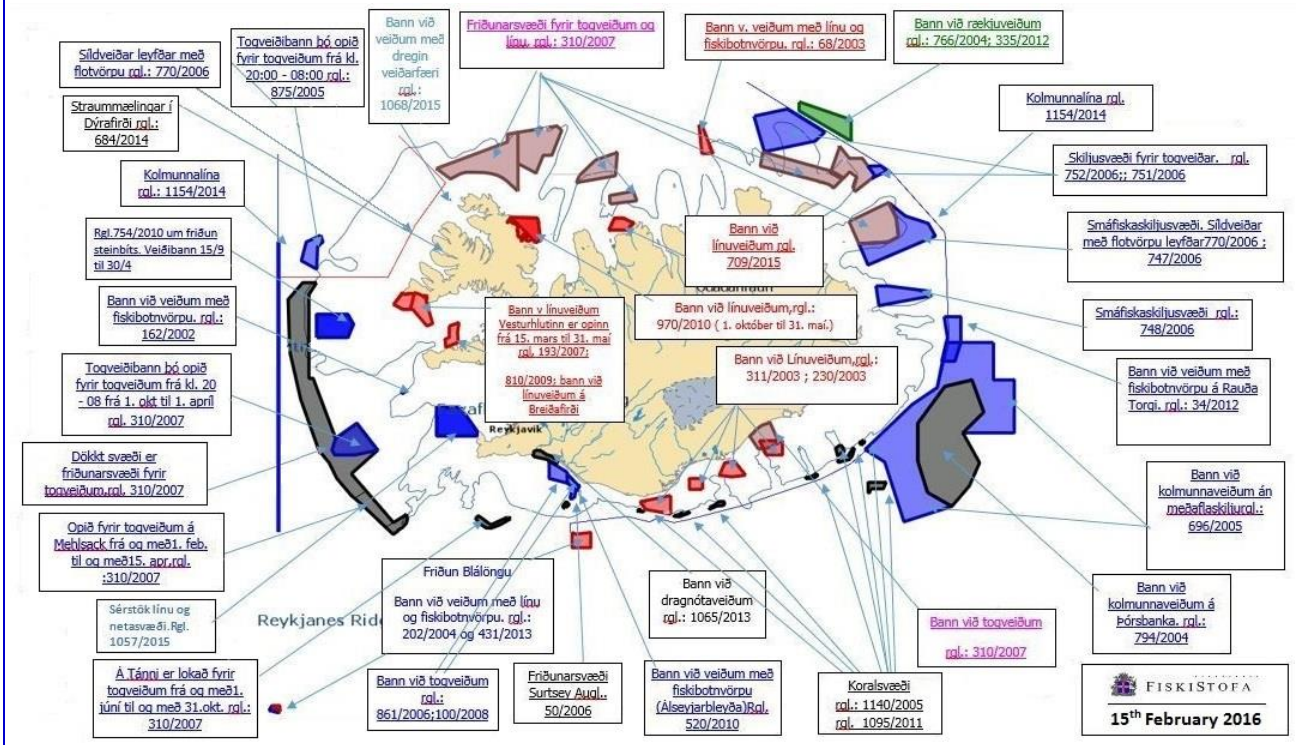

Figure 8. All closures according to the Fisheries directorate as of 15th February 2016[31].

[30] http://www.fiskistofa.is/media/veidisvaedi/Hrygningarstopp_2.pdf
[31] http://www.fiskistofa.is/fiskveidistjorn/veidibann/reglugerdarlokanir/

Clause 1.4 – External Scientific Review

Supporting Clauses:	1.4.1, 1.4.2			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***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. Following external scientific review, the competent fisheries management authority shall review and/or revise the harvesting policy, taking into consideration the external review, as appropriate.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Stock assessments are regularly supervised by ICES, which is considered to be the appropriate international scientific body. ICES evaluate management plans at the request of relevant fisheries managers. The stock assessment was evaluated in a benchmark process in 2013 and the management plan was reviewed and endorsed in 2013.

EVIDENCE

ICES[32] 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 have developed routines for more in-depth review of assessment methods and data that go into the assessment (benchmark assessments). Ideally, this should be done approximately every 5 years, or if there are reasons to alter the assessment practises; Icelandic haddock was benchmarked in 2013[33].

ICES evaluate management plans at the request of responsible managers. Normally, the work is done outside ICES and reviewed and endorsed by ICES. The evaluation work for the current management plan for Icelandic haddock was done by MRI, and reviewed by ICES. The review was undertaken with respect to the HCR's consistency with precautionary and MSY approaches[34].

[32] http://www.ices.dk

[33] http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKROUND/WKROUND%20Report%202013.pdf

[34] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/Special%20requests/Iceland%20longterm%20MP%20for%20Icelandic%20haddock.pdf

Clause 1.5 – Advice and Decisions on TAC

Supporting Clauses:	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			
Important Note:	Clause 1.5.1: Text added (**Bold**) in IRFM Standard Revision 2.0: "*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****."* Minor change – Timeliness of fisheries advice addressed specifically below. Clause 1.5.9: Minor change to wording and text added (**Bold**). IRFM Standard Issue 1 Revision 1: *Management agreements reached in the competent Regional Fisheries Management Organization(s) or arrangements, relevant to the stock under consideration, shall be implemented by states and effectively and uniformly executed.* IRFM Standard Revision 2.0: *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.* Minor change – Management authorities' cooperation and participation in RFMOs or arrangements addressed specifically below.			
Clause Guidance:	***Appropriate scientific advice shall be provided to the competent fisheries management authority including on the appropriate value(s) for precautionary reference points. For shared stocks the setting of TAC shall take into consideration international agreements and scientific advice. Decisions on TAC shall be made and implemented in such a way as to ensure that the actual catch is as close to the intended catch as practically possible.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The Minister of Fisheries and Agriculture decides on the TAC of the haddock stock for each fishing year (September to August) in accordance to law (Fisheries Management Act 116), based on the advice by MRI. The MRI advice is based on work and advice by ICES and on the management plan for haddock.

EVIDENCE

The Minister of Fisheries and Agriculture decides on the TAC of the haddock stock for each fishing year (September to August) in accordance to law (Fisheries Management Act 116), based on HCR and the advice mentioned below. Since the introduction of the HCR in the 2013/2014 fishing season the scientific advice has been according to the rule, and the TAC has been set equal to the advice.

The MRI advises the Minister of Fisheries and Agriculture on the exploitation of the haddock stock in June each year; ICES also provide advice. Both ICES and the MRI advise on research and harvesting policy in general. The recommendation given by the MRI is peer reviewed by the Advisory Committee (ACOM) of ICES every year.

Fisheries advice is provided in a timely manner

Fishing seasons in Iceland runs from the 1st September in year y to the 31st August in year y+1. Surveys and ICES[35] and MRI[36] assessments are conducted early in the year so as to allow advice books to be published in May/June. Following the publication of fisheries advice regulations on quotas are enacted in July[37], well in advance of the commencement of the fishing season on the 1st September.

Management authorities' cooperation and participation in RFMOs or arrangements

Some of Iceland´s commercially important fish stocks extend beyond its 200 nm EEZ and as a result are shared between countries/states; these shared stocks have necessitated the development of international cooperation. The major shared fish stocks in Iceland are golden redfish (*Sebastes marinus*), deep sea redfish (*Sebastes mentella*), Greenland halibut (*Reinhardtius hippoglossoides*), capelin (*Mallotus villosus*), blue whiting (*Micromesistius poutassou*), Atlantic mackerel (*Scomber scombrus*) and Norwegian spring spawning herring (*Claupea harengus*). Being a local stock, haddock is solely managed by Iceland.

Other examples of Iceland's fisheries management authorities cooperating internationally include:

- An agreement on the management of the capelin stock between Iceland, Greenland and Norway.
- A consensus reached between the EU coastal states, the Faeroe Islands, Iceland and Norway on the management of the blue whiting stocks.
- An agreement on quota sharing between the coastal states for Norwegian spring spawning herring.

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

- The North East Atlantic Fisheries Commission (NEAFC[38])
- The Northwest Atlantic Fisheries Organisation (NAFO[39])
- The International Council for the Exploration of the Sea (ICES[40])
- The North Atlantic Marine Mammal Commission (NAMMCO[41])

[35] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/had-iceg.pdf
[36] http://www.hafro.is/Astand/2016/fjolrit_185.pdf
[37] http://www.stjornartidindi.is/Advert.aspx?RecordID=12283ed3-7afd-4cd0-80e5-f2824e82618b
[38] http://www.neafc.org/
[39] http://www.nafo.int/
[40] http://www.ices.dk/Pages/default.aspx
[41] http://www.nammco.no/

7.2. Section 2: Compliance and Monitoring

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

Supporting Clauses:	2.1.1, 2.1.2			
Important Note:	Clause 2.1.2 is new to IRFM Standard Revision 2.0 and is scored separately in Appendix 2.			
Clause Guidance:	***An effective legal and administrative framework at the local, national or regional level, as appropriate, shall be established for the fishery, and compliance shall be ensured through effective mechanisms for monitoring, surveillance, control and enforcement.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

An effective legal and administrative framework has been established through various fisheries management acts. Compliance is ensured through strict monitoring, control and enforcement carried out by the Directorate and the Icelandic Coastguard.

EVIDENCE

The primary legislative instrument relating to fisheries management in Iceland, the **Fisheries Management Act No.116/2006**[42] superseded the Fisheries Management Act 1990 and establishes the requirement for all commercial fishing vessels to be permitted. These permits represent the initial legal requirement without which a vessel may not obtain the quota necessary to fish for Icelandic quota stocks. There are two categories of permit; a general permit with quota and a general permit with a hook-and-line quota. A register of all vessels permitted to fish in Icelandic waters is administered by the Maritime Division of the Icelandic Transport Authority.

The Act governing fishing activities within the Icelandic EEZ (Act No. 79/1997)[43] is the foundation for the Icelandic system of Individual Transferrable Quotas (ITQs) and grants powers relating to its administration to the Minister. The Act outlines the administration of fees where appropriate, the provision of powers to the Fisheries Directorate, penalties for breaches of the regulations and criteria for enacting temporary provisions. It further provides for the efficient utilisation of commercial stocks, specifies the Icelandic EEZ and prohibits foreign vessels from fishing within Iceland's EEZ (unless by prior Agreement). Under the Act the Ministers powers include, but are not limited to, the ability to limit gear types, fishing areas, fishing for certain stocks, prevent fishing in areas where the proportion of undersized fish in the catch exceeds agreed upon reference levels, and set rules surrounding the minimum legal saleable size of marine animals.

Penalties for violation of the provisions of the Act include up to 6 months imprisonment, confiscation of fishing gear and catch, temporary suspension of licenses and fines for violations of up to ISK 4,000,000 for a first offence and between ISK 400,000 and ISK 8,000,000 for repeat violations.

The Treatment of Commercial Marine Stocks **Act No. 57 1996** prohibits discarding and fishing without sufficient quota. In addition the Act stipulates that all fish caught within the Icelandic EEZ, or during trips where a proportion of fishing activities take place in the EEZ, must be landed in an officially recognised port which need not necessarily be Icelandic.

[42] http://eng.atvinnuvegaraduneyti.is/media/acts/Act-no-116-2006-on-Fisheirs-Management.pdf
[43] http://eng.atvinnuvegaraduneyti.is/media/acts/Act-no-79-1997-Fishing-in-Iceland-Exclusive-Fishign-Zone.pdf

Within 2 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[44] and Regulation No. 224 2006 on Weighing and Recording of Catch[45]; the Act[46] also makes provisions for processing at sea, weighing by auction houses and the transfer of quotas to cover landings.

During the first surveillance site visit (October, 2015) 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.

Each landing generates a weighing receipt recording:

- Vessel name, registration number and district number;
- Landing port and date of landing;
- Name of seller, buyer and recipient of the catch;
- Official weight by species of catch;
- Proportion of undersize fish in catch;
- Number, type and weight of tubs/boxes/barrels;
- Fishing gear used;
- Total number of pallets of platforms;
- Registration number and tare of transport vehicle;
- Whether catch is to be re-weighed;
- Whether any of the catch is un-gutted and needs to be either weighed after gutting or converted to a gutted weight using coefficients provided by Directorate.

The officially licensed scale operator then immediately enters the data into Directorates catch registration system.

The Directorate of Fisheries is responsible for the day-to-day implementation of Fishery Regulations; however, at sea surveillance is primarily the remit of the Icelandic Coast Guard.

The Directorate of Fisheries (Fiskistofa[47]) comprises approximately 70 staff split between its HQ, which has recently moved from Hafnarfjörður to Akureyri, and 6 other locations around the country. Surveillance is a big part of the work of the Directorate and it may be shore based, at sea or electronic using Vessel Monitoring Systems (VMS) and e-logbooks. In 2015, inspectors from the Directorate spent 1370 days at sea on fishing trips.

The Icelandic Coast Guard monitors commercial fishing vessels in Iceland's EEZ on a continuous basis. There are requirements surrounding the reporting of vessel position (manually or with using VMS systems) and the reporting of catch on entering or leaving Icelandic waters. Assessors visited the coastguard HQ during the surveillance audit site visit and were given a tour of the various monitoring and enforcement systems in place which represent effective mechanisms for the monitoring, surveillance, control and enforcement of fishing, and related activities, within Icelandic waters.

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. The main reasons for the generation of remarks during Coast Guard inspections have remained

[44] https://eng.atvinnuvegaraduneyti.is/laws-and-regulations/fisheries/
[45] http://eng.atvinnuvegaraduneyti.is/laws-and-regulations/fisheries/
[46] http://www.fisheries.is/management/fisheries-management/the-fisheries-management-act/
[47] http://www.fiskistofa.is/

consistent across the period from 2005 to present (Figure 9); Note in this instance equipment relates to safety equipment and not to fishing gear which has a separate category.

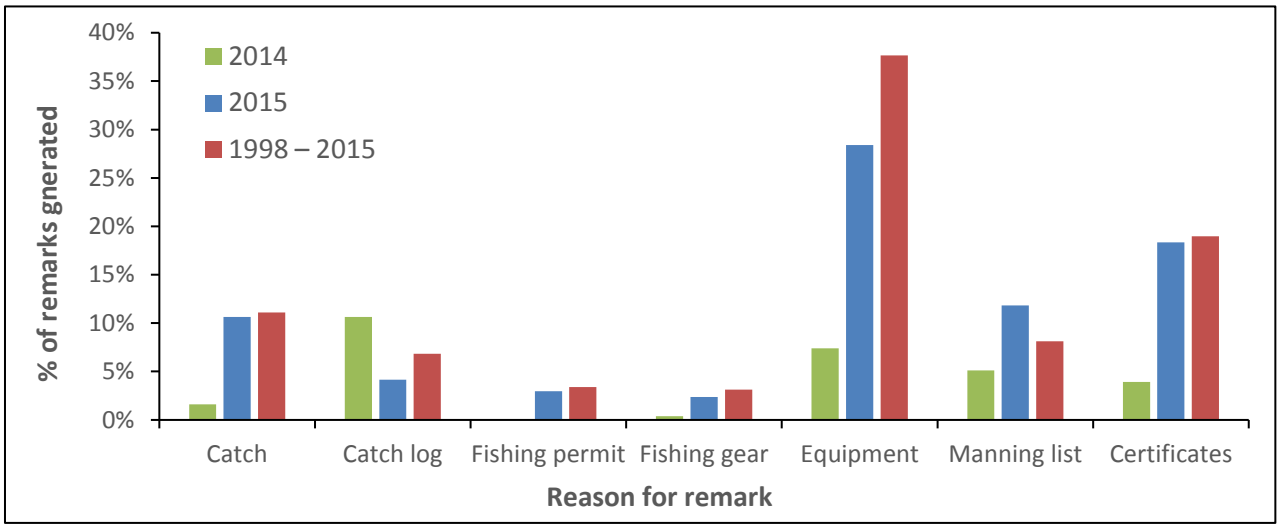

Figure 9. Reasons for the generation of remarks, by % of remarks generated, during Coast Guard inspections in 2014, 2015 and from 1998 – 2015.

Clause 2.2 – Concordance between actual Catch and allowable Catch

Supporting Clauses:	2.2.1, 2.2.2, 2.2.3, 2.2.4 and sub-clauses			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***Concordance between the Total Allowable Catch (TAC) and actual total catch from the stock under consideration shall be ensured through monitoring, control, enforcement, documentation and correction and verification activities. Accordingly, all participating companies engaged in fishing operations shall take responsibility and operate in compliance with the relevant rules and regulations.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Catch must be weighed by an official weigher within 2 hours of landing. Standardised weights and tares for ice and tubs (with a capacity of 208 – 300kg) are used throughout the fishery. The registered weight for each landing is sent to the Fisheries Directorate, where it is compared to the e-logbook data for the fishing trip, before the appropriate amount is subtracted from the vessels quota. The official weights used are the standardised registered landing weight with logbook records being used as a supplementary source to cross-check landings. ITQ transfers are also monitored to ensure that in cases where vessels do not have sufficient quota to cover the entirety of their catch additional quota is rented in from other sources within 3 days of the landing date.

EVIDENCE

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

The Fisheries Directorate have at their disposal a number of IT based monitoring, reporting and recording systems developed and serviced by TrackWell, an Icelandic electronic systems based service company; these include satellite Vessel Monitoring Systems (VMS), e-log systems and electronic reporting systems both of which are legal requirements and generate mandatory reports to the Directorate. Data on catches and landings is available in near real-time providing a valuable management reporting system for fleet management. The vessel log book system requires that the operator of a vessel reports information for each haul of the fishing gear to the Directorate including; haul number, date, time, latitude, longitude, catch by species, zone, water depth, seafloor, wind direction, wind speed, gear used, as well as other information. There are also other elements of the system which allow fishing companies to compile the data from their vessel(s) in order to facilitate better targeting of fishing activity in terms of area, species or size class of product dependent on the market demands at the time and also to ensure better traceability of product.

Information is fed from a secure central server to a shared database that is accessible by both the Directorate (for management/enforcement purposes) and the MRI (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)[48].

Fishing seasons in Iceland run from 1st September to 31st August the following year. Seasonal Total Allowable Catches (TACs) are set by the Minister of Fisheries and Agriculture, based on the recommendations from the Marine Research Institute (MRI); the International Council for the Exploration of the Sea (ICES) also provides advice on important Icelandic stocks, such as cod, haddock, saithe and golden redfish. Following the setting of the overall TAC each vessel is allocated a certain share of the overall TAC based on the number of shares in the Icelandic system of Individual Transferrable Quotas (ITQs) it possesses. Before catch is allocated proportions of the TAC of some species is removed for various reasons such as for the coastal fisheries which any small boat in possession of a licence may access, for research purposes or for chartered angling vessels.

ICES advised in 2015 that catches for the 2015/2016 season should be no more than 36,400 t. The TAC set by Icelandic authorities for haddock in the quota year 2015/2016 was 36,400 t[49]. Actual catches in the 2015/2016 season were approx. 40,000 t. Catches of haddock in the quota year 2015/2016 were ~10% in excess of TAC recommendations (Table 5). In 2016 ICES and MRI advised that catches of haddock in the 2016/2017 fishing season, based on the 2016 stock assessment and in accordance with the accepted HCR, should be no more than 34,600 t. The TAC for haddock in the 2016/2017 fishing season has been set at 34,600 t by the Icelandic Authorities.

Table 5. TAC versus catches of haddock in recent fishing seasons.

Season	Rec. Tac	TAC	Catches						
			VS	Undersized	Longline discount	Foreign	Coastal	ITQ	Total
2016/2017	**34,600**	**34,600**							
2015/2016	**36,400**	**36,400**	409	73	1,231	1,471	31	36,815	**40,030**
2014/2015	**30,400**	**30,400**	746	156	1,291	1,405	35	33,146	**36,779**
2013/2014	**38,000**	**38,000**	941	181	1,607	743	34	36,126	**39,632**
2012/2013	**32,000**	**36,000**	908	235	1,707	598	41	37,649	**41,138**

In recent fishing seasons catches of haddock in Icelandic waters have generally been in excess of scientifically advised TACs. There appear to be a number of factors contributing to these overshoots including inter-annual and inter-species transfers, VS catches and catches by foreign vessels. There may also be some legacy haddock quota that has yet to work its way through the quota system from when the fishery was managed under the old HCR.

A review of the composition of excess 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. At the time of the first surveillance (October 2015) the Ministry advised that excess catches in 2014/2015 as a result of issues with the exchange "pot" had already been compensated for in the allocation of quota for 2015/2016 with 1,100 tonnes of haddock quota not being allocated and instead being retained by the Ministry as a "reserve"; this

[48] http://eng.atvinnuvegaraduneyti.is/media/reglugerdir/Regulation-224-2006-on-weighing-and-recoding-of-catch.pdf
[49] http://www.hafro.is/Astand/2016/ysa_2016.pdf

is evidenced by "special" allocations of haddock quota for the 2015/2016 season resulting in the removal of 967t of haddock quota, representing 1,151t live-weight of haddock, from the ITQ allocation system[50].

Historically, catches of Icelandic haddock by foreign vessels as a percentage of overall catches had been minimal and as a result there was no deduction to account for these prior to the allocation of Icelandic haddock quota. Pre-allocation deductions in haddock quota to account for fishing by foreign vessels were considered following the 2014/2015 season; however, ultimately these were not introduced. The Ministry have advised that, following a recent general election, the allocation of haddock quota will again be raised with the new Minister when he/she takes office in January 2017.

Given that 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 management system for haddock is inherently robust to the fact that catch-balancing mechanisms may in any year result in catches of haddock which exceed recommended TACs.

Considering the relevant Clauses 2.2.1 and 2.3.5.1 of the Iceland Responsible Fisheries Management Specification:

Clause 2.2.1 – "*Concordance between the Total Allowable Catch (TAC) and actual total catch from the stock under consideration shall be ensured through monitoring, control, enforcement, documentation, correction and verification."*

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."*

It is clear that; 1) monitoring is continually taking place; 2) analysis has been carried out which has both detected deviations of actual total catch from TAC and demonstrated the reasons behind these deviations; and, 3) management authorities have recognised the issue and have taken some measures to correct for overshoots of the haddock TAC.

While concordance between TAC and actual total catch in 2015/2016 was less than desired given a TAC overshoot of ~10%, it was better than the 2014/2015 fishing seasons as a result of actions by management to remove some quota from the system prior to the fishery. As a result of the precautionary nature of HR_{MGT} (0.4), well below both HR_{pa} (0.46) and HR_{MSY} (0.52), total catches are unlikely to impact the long term sustainability of the haddock stock.

It seems likely that, under the current management system, catches will continue exceed TACs, defined by the catch rule, unless greater provision is made for some catches, e.g. fishing by foreign vessels. All catches are recorded and are included in annual stock assessments. Fishing mortality has been estimated as less than F_{MSY} in the most recent assessment. Excess catches are likely to remain small, but represent a minor increase in overall risk. Going forward levels of concordance will continue to be reviewed during surveillance activities.

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

Clause 2.3 – Monitoring and Control

Clause 2.3.1 – Vessel registration and catch quotas

Supporting Clauses:	2.3.1.1, 2.3.1.2, 2.3.1.3, 2.3.1.4			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***Allocated catch quotas by species to registered vessels are assigned in such a way that the combined quotas conform to the currently effective decision on TAC. Accordingly, information on the size and composition of the fleet of fishing vessels shall be available and documented, and the catch quota of each vessel or vessel group for each fish species and fishing year shall be recorded in the official central database in a transparent manner.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

As the share of the TAC allocated to vessels is based on the number of shares for that particular species that the vessel owns the overall value of quota allocated cannot in the first instance exceed the TAC set by the Icelandic authorities; additional transfers either between years or between species may cause the amount vessels are allowed to catch to increase (Note cod is an exception in that there is no species from which quota may be converted into cod).

The overall TAC for the 2015/2016 fishing season for haddock was set at 36,400 t, of this 34,471 t was allocated via the quota system. In addition to the initially allocated quota there were an additional 2,498 t allocated as a result of the longline discount (1,425 t) and a balance transfer from the 2014/2015 season (2,224 t) minus compensations (-1,151 t)[51]. During the season 3,252 t of additional haddock quota was transferred from other species. A positive balance approx. 1,948 t of haddock quota was transferred to the 2016/2017 fishing season. Note all weights quoted in this paragraph are live weights unless otherwise stated.

EVIDENCE

Quotas conform to the overall decision on TAC, through the individual vessel quota share. Catches by vessel are monitored and recorded in near real-time in a central database curated by the Fisheries Directorate. The official weight of the catch is subtracted from that vessels individual quota share for a particular species. Should a vessel not have sufficient quota to cover its landings it may rent in quota, transfer quota between species based on the cod equivalent values of each species, keep 20% of the value of the overage while forfeiting the remainder to scientific research or transfer a limited amount to the following fishing season where it is taken off that vessels individual quota share for that species.

Only vessels in possession of a valid permit from the Directorate of Fisheries are eligible to fish commercially. A register of permitted vessels is maintained by the Minister of Transport and Communications and the Icelandic Maritime Administration (IMA). By regulation only Icelandic licensed vessels (with some exceptions) are permitted to fish in Iceland EEZ.

531 vessels recorded landings of haddock in the 2015/2016 fishing season. 602 vessels received haddock quota through an initial quota allocation only (231), compensations only (219) or a combination of the initial

[51] http://www.fiskistofa.is/english/quotas-and-catches/total-catch-and-quota-status/?skipnr=0&timabil=1415&fyrirspurn=UmSkip&landhelgi=i

and special allocations (152). Vessels recording catches that did not receive an allocation of quota are required to transfer quota from other vessels/species to cover their catches. 257 vessels undershot their quota and had excess quota to transfer to the 2016/2017 season while 232 vessels overshot their quota with the negative balance to be debited from their allocation for the 2016/2017 fishing season. For illustrative purposes Table 6 shows the first 10 lines of the publically available[52] data on individual vessels' quota allocations of haddock in the 2015/16 fishing season.

Table 6. First 10 lines of table showing the Icelandic fleet's haddock TAC allocations, transfers, balances and catches for the 2015/2016 fishing season (Figures are kilogrammes of gutted catch).

Reg. no.	Vessel	Class	Alloc. quota	Compensations	Trfr. prev. year	Trfr. b/t vessels	Allowed catch	Catch	Balance	Over fished
78	Ísborg ÍS 250	A	0	2,042	0	-1,862	180	0	180	0
89	Grímsnes GK 555	A	5,899	0	0	-5,832	67	186	-119	0
155	Lundey NS 14	0	0	-12,520	0	12,520	0	0	0	0
173	Sigurður Ólafsson SF 44	A	39,837	0	4,990	6,450	51,277	45,390	5,887	0
177	Fönix ST 177	A	0	2,589	0	-1,758	831	831	0	0
182	Vestri BA 63	A	32,077	2,212	-216	-19,923	14,150	22,535	-8,385	0
233	Erling KE 140	A	95,804	0	12,001	-107,643	162	1,073	-911	0
237	Fjölnir GK 657	A	339,859	-50,952	42,574	-120,433	211,048	231,332	-20,284	0
253	Hamar SH 224	A	58,093	3,594	0	37,841	99,528	110,271	-10,743	0
259	Jökull ÞH 259	A	3,600	0	0	-3,600	0	0	0	0

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 in a transparent manner and is publically accessible.

Registered catches are based on information from ports of landing and information on catcher exported unprocessed. The catch statistics are published, subject to change once they have been compared to submitted reports from buyers, and are available at:
http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/

[52] http://www.fiskistofa.is/english/quotas-and-catches/quota-status-and-catches-of-species-by-vessel/

Clause 2.3.2 – Fishing vessel monitoring and control systems

Supporting Clauses:	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**			
Important Note:	Clause 2.3.2.17 represents a new Clause in IRFM Standard Revision 2.0 and is scored separately in Appendix 2.			
Clause Guidance:	***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. Closed areas shall be monitored, the fishing gear and fishing logbooks shall be subject to inspection, as well as the composition of the catch and its handling onboard the fishing vessels. Catch amounts by species and fishing area shall be estimated and continually recorded in fishing logbooks on-board the fishing vessels. Discarding of catch from the stock under consideration shall be prohibited, those that may occur shall be monitored and all catches shall be landed in authorised fishing ports where harbour officials and fisheries inspectors shall monitor the correct weighing and registration of the catch. Accordingly, vessels must comply with all relevant National Fishery Management measures.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The Icelandic Coastguard administers the VMS for all Icelandic vessels and for all foreign vessels (including fishing vessels) that enter Icelandic waters as part of an integrated monitoring, control and surveillance (MCS) system. The purposes of the MCS system are numerous including maritime traffic control, marine search and rescue and fisheries enforcement. The importance of the fisheries sector to the Icelandic economy and the need for greater efficiency, due to the relatively small size of the institutions involved, has led to high levels of collaboration and integration resulting in creative and dedicated approaches to fisheries management and enforcement. The fisheries MCS system in Iceland has at its core the effective use of available technology meaning relatively small staff numbers are able to achieve extensive monitoring of the Icelandic fishing industry.

EVIDENCE

The Icelandic Coastguard administers the VMS for all Icelandic vessels and for all foreign vessels (including fishing vessels) that enter Icelandic waters as part of an integrated monitoring, control and surveillance (MCS) system. The purposes of the MCS system are numerous and it incorporates several related services including maritime traffic control, marine search and rescue, fisheries enforcement, coastal radio and border control in a single operations centre. The importance of the fisheries sector to the Icelandic economy and the need for greater efficiency, due to the relatively small size of the institutions involved, has led to high levels of collaboration and integration resulting in creative and dedicated approaches to fisheries management and enforcement. The fisheries MCS system in Iceland has at its core the effective use of available technology meaning relatively small staff numbers are able to achieve extensive monitoring of the Icelandic fishing industry.

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

The ICG uses several different but complementary electronic vessel monitoring systems including satellite-based systems including VMS and satellite radar images, the monitoring of coastal activity through a dedicated land-based very high frequency (VHF) system and the use of the Automatic Identification System (AIS). The VHF and AIS systems have a range of 30–60 nautical miles while the satellite-based VMSs can be used anywhere in the world. The use of complementary systems ensures that the limitations that arise when any one system is used in a standalone capacity are mitigated. These electronic MCS systems are further backed up by more traditional methods of surveillance such as patrol vessels and aircraft; indeed the use of electronic systems in the effective targeting of traditional surveillance methods increases the efficiency of these systems. 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 10).

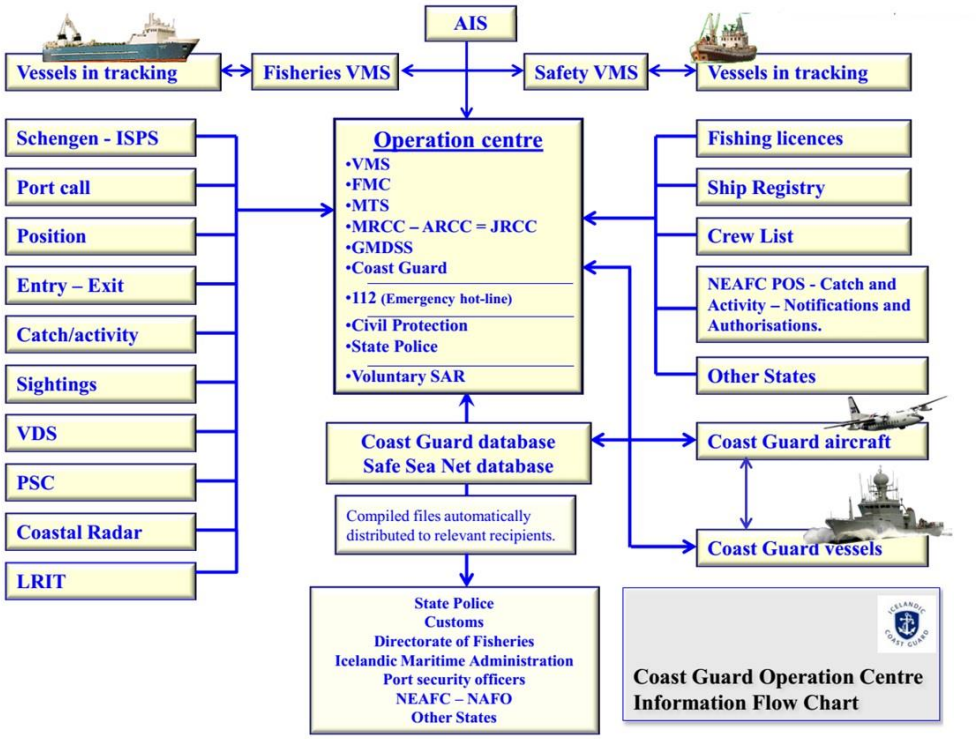

Figure 10. Schematic outlining the inputs which make up the integrated Monitoring, Control and Surveillance (MCS) system in Iceland.

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 while log books may be subjected to in-port inspections by inspectors from the Fisheries Directorate. Data on coastguard enforcement activity in the past year has been provided in Clause 2.1.

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

Clause 2.3.3 – Catches are subtracted from relevant quotas

Supporting Clauses:	2.3.3.1, 2.3.3.2, 2.3.3.3, 2.3.3.4, 2.3.3.5			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***Landed catches shall be subtracted from the relevant quotas (allowable catch) of the vessel or vessel group. 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. Transfer of quota between vessels shall take effect only after it has been authorised and recorded to the official central data base and information on each vessels catch quota and quota use shall be updated regularly and made public and accessible to all on the official website, thus ensuring transparency.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

As the Icelandic groundfish fishery is a mixed fishery it is necessary to incorporate a degree of flexibility in the quota management system so that the species composition of catches may be matched with the quota portfolio available to individual fishing vessels. There are a variety of provisions in place to facilitate flexibility and reduce any potential incentives relating to the discarding of fish. Current quota share ad TAC allocations by species as well as running catch totals and remaining quota for the season for each vessel are freely available on the Directorates website meaning the system is very transparent.

EVIDENCE

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

A vessel is allowed to exceed its allocation for a particular species in a fishing season by up to but not exceeding 5%; the excess is then deducted from that vessels allocation for that species in the following fishing season. Additionally, a decision may be taken to postpone fishing up to 15% of ones quota for a particular species in a fishing season and transfer the balance to the following season; this measure may be particularly beneficial to the growth of long-lived species in maximising the return from strong year classes. The results of some of inter-vessel and inter-seasonal transfers aimed at balancing catches and quotas may be seen in the table provided under clause 2.3.1.

In addition to within-species quota transfers between vessels and/or fishing seasons the systems also makes provision for some limited quota transfer between different species; note that it is not possible to convert quota of other species for cod quota (e.g. cod quota may be exchanged for haddock quota but haddock quota may not be exchanged for cod). Interspecies transfers of quota are based on cod-equivalents a nominal value based around the market value of cod. The cod-equivalent value of a particular species may fluctuate in a particular season depending on the relative market value of that species in relation to the market value of cod.

The cod-equivalent values of a number of representative species during the 2011/2012 to 2016/2017 season are presented in Table 7. As can be seen the cod-equivalent value for more commercially valuable species is consistently higher across seasons. As previously discussed, cod equivalent values change seasonally.

Table 7. 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**
Cod	*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**
Saithe	0.63	0.73	0.82	0.81	0.77	0.79
Golden redfish	0.71	0.82	0.89	0.85	0.79	0.69
Norway lobster	4.35	4.70	6.46	5.98	5.98	6.10
Turbot	2.62	1.85	3.43	4.12	4.79	4.06
Greenland halibut	2.12	2.47	2.67	2.59	2.48	2.65
Anglerfish	1.57	1.74	1.98	2.27	2.05	2.17
Ling	0.55	0.59	0.73	0.76	0.68	0.68
Tusk	0.37	0.39	0.52	0.51	0.47	0.42
Mackerel	0.22	0.36	0.36	0.41	0.32	0.21
Capelin	0.10	0.08	0.14	0.14	0.12	0.17

Current quota share and TAC allocations by species as well as running catch totals and remaining quota for the season for each vessel are freely available on the Directorates website meaning the system is very transparent[53].

All transfers of quota must be authorised by the Fisheries Directorate. Application forms for the transfer of quota are available online and must be transmitted directly to the Directorate for authorisation of the transfer. If a fishing company wishes to transfer quota between two or more of its own vessels they may do so within all the relevant laws and regulations. All the necessary application forms for transfer of quota are available online[54].

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

Clause 2.3.4 – Rules are enforced

Supporting Clauses:	2.3.4.1			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	**Surveillance and enforcement of rules are carried out by the Icelandic Coastguard, the Marine Research Institute and the Fisheries Directorate. There are various penalties for serious infractions depending on the nature of the infraction and the number of times the offender has contravened the regulations.**			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Surveillance and enforcement of rules are carried out by the Icelandic Coastguard, the Marine Research Institute and the Fisheries Directorate. There are various penalties for serious infractions depending on the nature of the infraction and the number of times the offender has contravened the regulations.

EVIDENCE

There is a clearly established legal framework which sets out rules and regulations relating to fishing activity within Icelandic waters and gives powers to the Ministry, the Fisheries Directorate, the Coast Guard and the MRI to monitor fishing activities and enforce these rules.

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 and Human Rights). In addition, within the remit of the overall Ministry of Industries and innovation, the MRI also has the legal power to enact temporary spatial closures.

A breakdown of enforcement activities in 2014, 2015 and the average for the period 1998 – 2015, was submitted by the Icelandic Coast Guard and is presented in the supporting evidence for Clause 2.1.

Clause 2.3.5 – Analysis is carried out

Supporting Clauses:	2.3.5.1, 2.3.5.2, 2.3.5.3			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***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. 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.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

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.

EVIDENCE

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. 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.

There are effective systems in place to ensure the traceability of catch. The detailed spatial information available for each fishing trip means catch may be traced directly from whence it was caught through subsequent processing, export and delivery to final market. Information relating to the provenance of the catch is communicated both to the Directorate's website and directly to the purchaser.

The official registration of landings contains a unique vessel identifier relating to the fishing vessel that landed the catch allowing traceability to individual vessels. In most cases, the unique vessel identifier remains with the batch throughout production and often on the final pack. For wet fish sales, from the auction, a vessel unique number is registered within the central e-auction for tracking purposes.

Full traceability is possible using all the tools within the system, however, not all buyers require full traceability from fishing vessel to the final product.

7.3. Section 3: Ecosystem Considerations

Clause 3.1 – Guiding Principle

Supporting Clauses:	3.1.1, 3.1.2		
Important Note:	Clause 3.1.1: Text added (**Bold**) in IRFM Standard Revision 2.0: *Adverse impacts of the fishery on the ecosystem shall be considered and appropriately assessed and effectively addressed, **consistent with the precautionary approach**[55].* Clause 3.1.1 (minor change) – consistency with precautionary approach specifically addressed below.		
Clause Guidance:	***Adverse impacts of the fishery on the ecosystem (e.g. bycatch, ETP species interactions, habitat and foodweb interactions etc.) shall be considered, appropriately assessed and effectively addressed. Those impacts that are likely to have serious consequences shall be addressed. This may take the form of an immediate management response or further analysis of the identified risk.***		
Evidence Rating:	Low ☐	Medium ☐	High ☑
Non-conformance:	Critical ☐	Major ☐ Minor ☐	None ☑

SUMMARY EVIDENCE

Adverse impacts of the fishery on the ecosystem (e.g. bycatch, ETP species interactions, habitat and foodweb interactions etc.) are considered, appropriately assessed and effectively addressed.

EVIDENCE

The Marine Research Institute of Iceland (MRI) is the key institution charged with the gathering of scientific knowledge of the marine ecosystem in Iceland. MRI's activities are organised into three main sections and a number of supporting departments.

The Environment Section deals with environmental conditions, marine geology, and the ecology of algae, zooplankton, fish larvae, fish juveniles, and benthos. The Environment Section also investigates surface currents, assesses primary productivity, overwintering and spring spawning of zooplankton and conducts studies on spawning of the most important commercial fish stocks.

The Resources Section undertakes investigations on exploited stocks. The major part of the work of the Resources Section involves estimating stock sizes and TACs for commercially exploited stocks; annual stock assessment surveys for the various species are conducted in support of this.

The Advisory Section scrutinizes stock assessments and prepares the formal advice on TACs and sustainable fishing strategies for managers. In addition the MRI also includes important supporting departments including the Modelling and Electronic Departments and the Fisheries Library.

[55] 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....

Collectively the various Sections and Departments within MRI work together to determine the status of commercial species in Icelandic waters and enable managers to make informed decisions as to their sustainable exploitation. However, the remit of the MRI goes beyond species specific research to include monitoring of the wider marine ecosystem, 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

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

Another factor driving fluctuations in the abundance and distribution of Icelandic stocks is the availability of zooplankton which represent an important prey species for various species during various stages of their life cycles. The availability of sufficient zooplankton is considered to be an important factor which contributes to rates of larval mortality and research by the MRI has shown a correlation between spring zooplankton levels and the abundance of cod fry the following August indicating interconnectivity between species at different trophic levels. Studies aimed at following the long term trends in zooplankton abundance began around 1960 with recent years, 2013 – 2015, showing zooplankton abundances off North Iceland to be below historical averages[56].

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 the recent years.

Discards

Since 1996 discarding is prohibited and subject to penalty[57]. Practically, 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

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

[57] 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

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 fishery resource and promoting responsible fishing practices. VS catches of haddock in 2015/2016 totalled 403 t[58].

Retained catch

With regards to retained catches, most commercially fished species in Iceland are now part of the ITQ system. Discarding is prohibited and comparison between observer measured catch compositions and self-reporting by fishers ensures that a high level of compliance with the ban on discarding is maintained. 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.

Landings of haddock in the 2015/2016 season, including landings from the Barents Sea, totalled 40,500 t; of this 48.9% was taken by demersal trawls, 39.4% by longlines and 10.4% by Danish seines. The remaining 1.2% was made up of various gears each contributing <1% to overall catches including gillnets (0.7%), Nephrops trawls (0.3%), handlines (0.1%) and shrimp trawls (0.1%) (Figure 11). The status of those species comprising greater than 1% of overall catches in each of the main gears (contributing >1% of haddock landings) outlined above are presented in detail below.

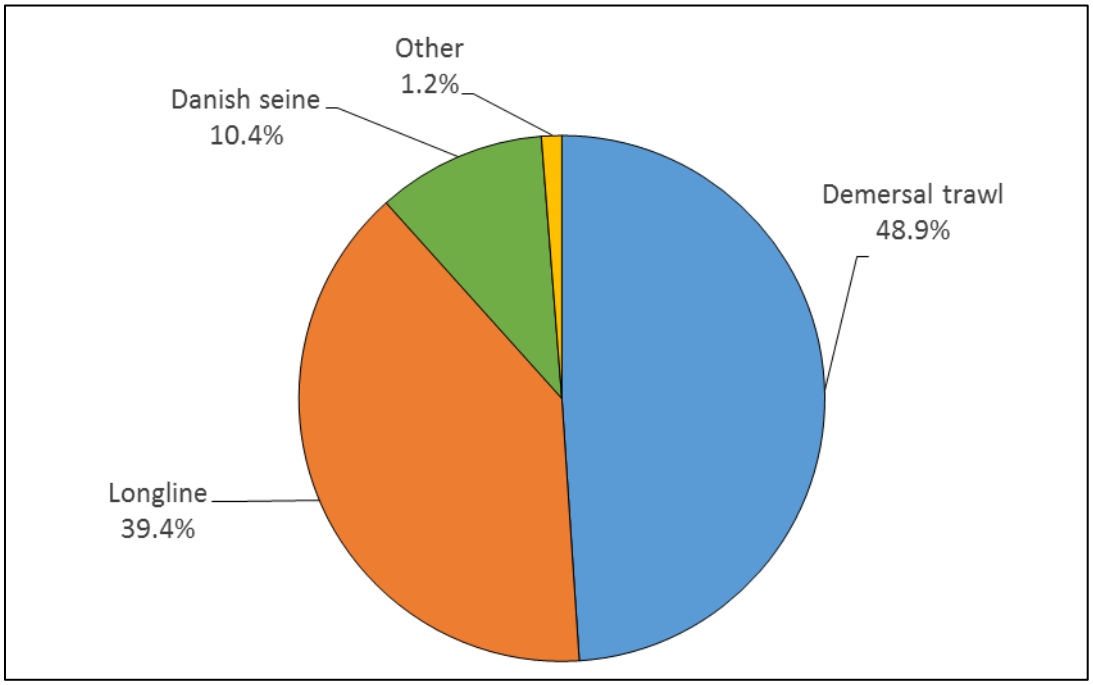

Figure 11. Proportion of total landings of haddock by gear type during the 2015/2016 fishing season (Source: Fisheries Directorate website: www.fiskistofa.is).

[58] http://www.fiskistofa.is/veidar/aflastada/vs-afli/vsafli.jsp

In the 2015/2016 fishing season, three fishing gears; demersal trawls, longlines and Danish seines accounted for a cumulative 98.8% of catches of Icelandic haddock. Retained species accounting for >1% of the cumulative total for each of these gear types are presented below (Table 8).

Table 8. Total catches and % contribution, by gear type, for species that represent >1% of the overall catch for the major gear types contributing >1% of haddock landings.

Gear type	Species	Total catches (t)	% Contribution to total catches by gear type
Demersal trawl	Cod	126,036	45.6%
	Golden redfish	50,008	18.1%
	Saithe	42,763	15.5%
	Haddock	**19,818**	**7.2%**
	Greenland halibut	10,211	3.7%
	Deep sea redfish	9,430	3.4%
	Greater argentine	5,563	2.0%
Longline	Cod	84,317	69.4%
	Haddock	**15,958**	**13.1%**
	Ling	6,387	5.3%
	Atlantic wolffish	5,782	4.8%
	Tusk	3,138	2.6%
	Golden redfish	1,573	1.3%
	Starry ray	1,185	1.0%
Danish seine	Cod	13,432	47.7%
	Plaice	5,046	17.9%
	Haddock	**4,211**	**15.0%**
	Atlantic wolffish	1,227	4.4%
	Lemon sole	1,143	4.1%
	Saithe	974	3.5%
	Witch flounder	657	2.3%
	Golden redfish	463	1.6%
	Dab	427	1.5%

These 14 species (ordered by total catches in the gears listed; cod, golden redfish, saithe, Greenland halibut, deep sea redfish, Atlantic wolffish, ling, Greater Argentine, plaice, tusk, starry ray, lemon sole, witch flounder and dab) constitute the major bycatch species in Icelandic haddock fisheries. Further information on the status of these stocks is presented below.

Cod

Estimated SSB has increased in recent years and has not been larger in 40 years. Harvest rate has declined and is at its lowest value in the assessment period. Recruitment since 1998 is lower than the average recruitment in the period 1955 – 1985. The 2013 year class is estimated small but the year classes of 2014 and 2015 that will enter the fishery in 2017 and 2018 are larger than the long-term mean recruitment. It is expected that reference biomass will decline in but if the 2014 and 2015 year classes meet current estimates the stock should increase in size. MRI advises that when the management plan is applied, catches in the fishing year 2016/2017 should be no more than 244,000 t. Estimated SSB_{2016} (464,000 t) is well above MSY $B_{trigger}$ (220,000 t), B_{lim} (125,000 t) and B_{pa} (160,000 t).

Golden redfish

The 2000 – 2005 year classes accounted for most of the catches in 2015. The 1996 – 2005 year classes are above average in size, but the 2006 – 2011 year classes are estimated to be below the average. Fishing mortality since 2010 has been estimated to be around F_{MSY}. Spawning-stock biomass (SSB) has steadily

increased for the past 20 years and is well above MSY $B_{trigger}$. As the 2006 – 2011 year classes are estimated to be small both total biomass and SSB are expected to decrease in 2016 and 2017 when these year classes recruit to the fishery. MRI and ICES advise that when the management plan is applied, catches in the fishing year 2016/2017 in the East Greenland/Iceland/Faroe Islands area should be no more than 52,800 t. According to an agreement between Iceland and Greenland, 90% of the TAC is allocated to Iceland. Estimated SSB_{2016} (354,800 t) is well above MSY $B_{trigger}$ (220,000 t) and B_{lim} (160,000 t).

Saithe
Stock size has increased in recent years and the SSB is now close to the average of 1980–2015. Recruitment in 2009–2015 was relatively constant and about 20% higher than the average. Harvest rate in 2015 was below HRMSY. Stock size is not expected to change much in coming years. In the prognosis, catches in 2016 are set at 60,000 t as catches are not expected to reach the set TAC. MRI advises that when the management plan is applied, catches in the fishing year 2016/2017 should be no more than 55,000 t. Estimated SSB_{2016} (143,000 t) is well above MSY $B_{trigger}$ (65,000 t), B_{lim} (44,000 t) and B_{pa} (61,000 t).

Greenland halibut
Greenland halibut from the East Greenland/Iceland/Faroe Islands region (GIF) are considered a single stock, so stock assessments and advice from ICES and the MRI have referred to it as such. At the end of May 2014, Iceland and Greenland adopted a bilateral five-year management plan for Greenland halibut. Fishing mortality has decreased in recent years, and is estimated to be relatively close to F_{MSY}. Biomass is slowly increasing. MRI and ICES advise that when the MSY approach is applied, catches in the 2016/2017 fishing year should be no more than 24,000 t. According to an agreement between Iceland and Greenland, 56.4% of the TAC is allocated to Iceland. Biomass is currently likely above both B_{lim} and $B_{trigger}$.

Deep sea redfish (Demersal beaked redfish)
Note: this refers to demersal beaked redfish and not pelagic deep-sea redfish. The lack of long-term indices of abundance prevent analytical assessment, but survey indices from the autumn survey since 2000 are used as basis for the advice. The stock size indicator has been stable over time, with some increase in the last two years (2014 and 2015); catches in the past three years have been the lowest since 1980.

Little information is available on sustainable yield of demersal beaked redfish. The fishable biomass is considered small compared to what it was in the beginning of the time series. The abundance index of fish 30 cm and smaller has in 2007 – 2015 been at low levels, indicating little recruitment to the fishable stock. The lack of long time-series of abundance indices prevents the determination of stock status of this long-lived species. The Iceland bottom trawls surveys cover the entire fishing area of the fishable stock in Icelandic waters. MRI and ICES advise that when the precautionary approach is applied, catches in the fishing year 2016/2017 should be no more than 12,922 t.

Atlantic wolffish
Biomass and juvenile indices are at their lowest levels in the time series. F_{proxy} has been high since 2000. Juvenile and biomass indices have been low recently. Therefore, the recommended catch levels are expected to decline in coming years, except advised reduction in fishing mortality is sufficient to stop the downward trend. MRI advises that when the precautionary approach is applied, catches in the fishing year 2016/2017 should be no more than 1,128 t.

Ling
Fishing mortality has declined since 2009 but is still above F_{MSY}. SSB has increased since 2004 and is at the highest level in the time series. Short term projections indicate a declining SSB as the result of low recruitment in 2012 – 2015 and that catches will decline as a result of that. MRI advises that when the MSY approach is applied, catches in the fishing year 2016/2017 should be no more than 9,343 t including catches of foreign fleets. Estimated SSB_{2016} (42,600 t) is well above MSY $B_{trigger}$ (9,500 t), B_{lim} (8,600 t) and B_{pa} (9,500 t).

Greater Argentine (Greater Silver Smelt)
The survey index indicated an increase in stock biomass in 2014, followed by a decrease in 2015. The F_{proxy} has decreased since 2010 and has been below the target F_{proxy} since 2014. MRI advises that when the precautionary approach is applied, catches in the fishing year 2016/2017 should be no more than 7,885 t.

Plaice
Recruitment has been low but steady since 1994. Fishing mortality has declined since 1997 and is at an all-time low, while biomass has slowly increased since 2000. The stock size is likely to remain stable over the next years, but considerable uncertainty is present in the assessment due to a lack of recruitment data. The MRI recommends that when the MSY approach is applied, catch should not exceed 7,330 t in the 2016/2017 fishing year. In addition, the MRI recommends that regulations regarding area closures on spawning grounds remain in effect.

Tusk
Recruitment peaked in 2004 to 2006 but declined to a historical low level in 2013 and has increased since. Fishing mortality has declined in recent years, but is above the F_{MSY} estimate. SSB has been increasing in recent years. According to the prognosis, the SSB and harvestable biomass will not increase in the near future as a result of low recruitment in 2011 – 2014. Catch levels will therefore be at similar level as the current advice. MRI advises that when the MSY approach is applied, catches in the fishing year 2016/2017 should be no more than 3,780 t including catches from foreign ships in Icelandic waters. In addition, continued closure of the known nursery areas off the southeast and southern coast should be maintained.

Starry ray
Starry ray are not a quota species in Iceland. The starry ray has always been fished as bycatch in a variety of fishing gear around Iceland and until recently been discarded as trash fish. The starry ray is fairly abundant all around Iceland, but no formal stock assessment is conducted on this species. Starry ray are primarily caught on longlines (84.7% of total catches in 2015/2016) and in Danish seines (6.9%).

Lemon sole
The survey biomass index has been relatively low for the past couple of years, in particular when compared to the 2003 – 2013 period. Estimated fishing mortality has been variable recently. IS-SMB recruitment index has been high since the year 2002. The survey recruitment index has been high and rising since the year 2000, and it is therefore likely that the stock biomass will increase if catch levels go down. Based on the precautionary approach, the MRI recommends a TAC of 1,087 t for the 2016/2017 fishing year.

Witch flounder
Biomass index has been high since 2004. The recruitment index has, however, declined since 2009, and reached an all-time low this year. F_{proxy} has remained relatively low over the last four years. Biomass index indicates that the stock was relatively large from 2004 and onwards. Low recruitment in recent years and small cohorts in 2009 – 2013 might lead to a decline in the stock in the near future. MRI advises that when the precautionary approach is applied, catches in the 2016/2017 fishing year should be no more than 1,110 t. Witch flounder are primarily caught in Danish seines (57.2% of total catches in 2015/2016) and Nephrops trawls (33%).

Dab
The survey biomass index was low in 2006 – 2009, higher between 2010 and 2014, but low over the past two years. Catch by length and age information is available from 1993–2015. Catch in 2015 consisted mostly of 5 – 7 year old fish. Considerable uncertainty exists around the 2016 stock biomass estimate due to lack of information on the fish hatched in 2011 – 2012 that are recruiting into the fishable population this year. MRI recommends a TAC no higher than 500 t for the 2016/2017 fishing year. The MRI also recommends that the defined management area from Snæfellsnes to Stokksnes be abolished with all dab fishing grounds coming under TAC limits.

Vulnerable species Interactions

Other species that do not encompass a major component of catches in the main gear types targeting haddock but that are seen to be either vulnerable or ETP species include the common skate (*Dipturus batis*), Atlantic halibut (*Hippoglossus hippoglossus*), spiny dogfish/spurdog (*Squalus acanthias*) and Greenland shark (*Somniosus microcephalus*). Annual landing statistics for each of these four species are presented in (Table 9) below.

Table 9. Icelandic landings in tonnes of common skate (*Dipturus batis*), Atlantic halibut (*Hippoglossus hippoglossus*), spiny dogfish (*Squalus acanthias* also known as spurdog) and Greenland shark (*Somniosus microcephalus*) 2004 – 2015.

Species	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Common skate	144	166	136	123	127	128	117	125	145	153	141	157
Atlantic halibut	670	630	559	516	529	548	557	555	36	39	45	87
Spiny dogfish	141	76	82	43	68	102	62	53	51	6	19	8
Greenland shark	66	50	28	2	35	26	43	18	19	6	26	18

Common skate (Grey skate)

The grey skate used to be fairly common in Icelandic waters, but has been overfished as catches are now only about 10% of catches 50 years ago. The status of the grey skate stock can be compared to the halibut stock as both species are at a low level. Both are widely distributed, fished in many types of fishing gear, very large and mature late**.** In 2015/2016 the total catch of skates in Icelandic waters was 156 t. No TAC is available for this species because there is no directed fishery for it. No assessment is carried out for grey skate and indices of abundance are uncertain as only limited survey data exists. However, trends in total number indicate some increase since 2000 in the groundfish surveys and substantial increases in total number in recent years in the Nephrops survey (MRI data provided to assessment team) (Figure 12).

MRI will continue to report on incidences of capture and distribution of skate during the spring bottom trawl survey as they have been doing since the survey began in 1985. In addition, catches in commercial fisheries will continue to be collected and the MRI will monitor whether significant changes either the survey results or the level of landed catches occur. Misidentification of species is an issue and can lead to some moderate errors in landings data. MRI is currently taking measures to improve skate identification by preparing skate ID sheets for distribution to the relevant fleet sectors and landings officials.

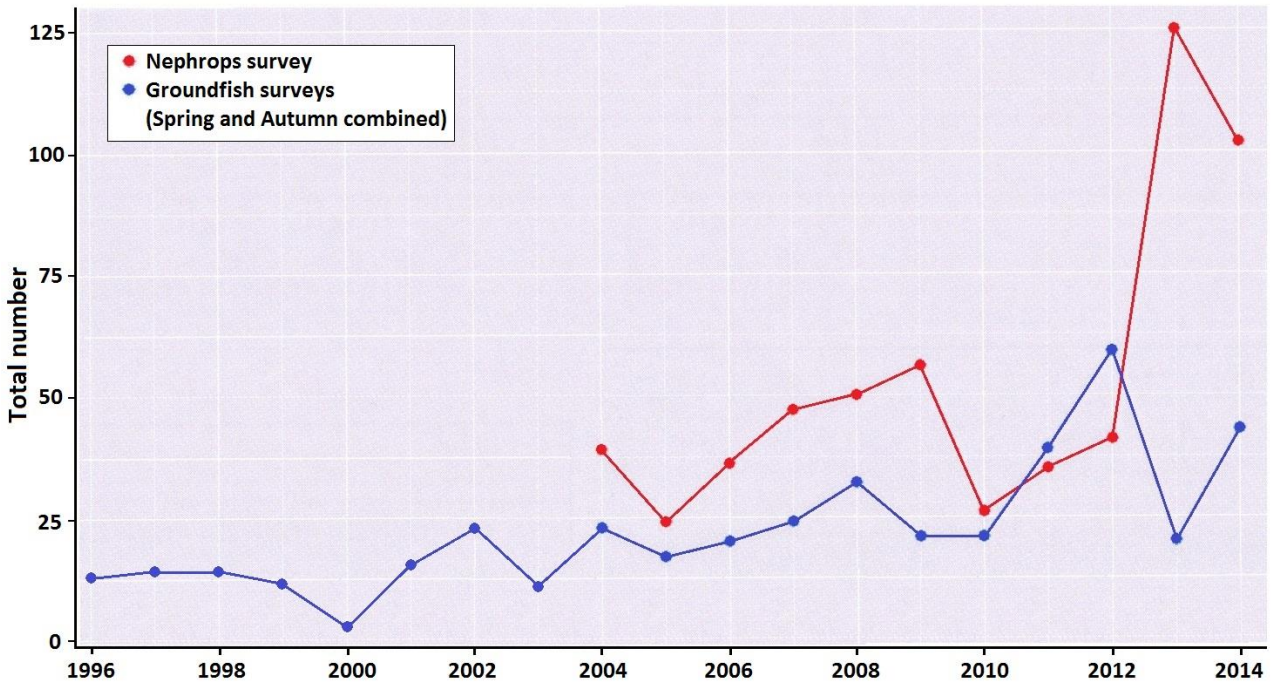

Figure 12. Grey skate total numbers in the Nephrops and groundfish surveys (Spring and Autumn combined) 1996 – 2014.

Atlantic halibut

Recruitment and biomass indices decreased rapidly between 1985 and 1992 and have remained low since. Survey catches of Atlantic halibut have predominantly been 3 – 5 year old immature fish. These age groups have been in decline for over 20 years, and it is evident that the stock has suffered a recruitment failure. It is therefore likely that the stock will remain low over the next years. In 2012, a regulation was issued to ban all targeted fishing for Atlantic halibut and stipulating that all viable halibut must be released in other fisheries the effects of which are evidenced by a sharp drop in halibut landings after 2011 (Table 9). MRI recommends that these regulations should be maintained until clear indications of improvement in the stock are evident. Total landings of Atlantic halibut in the 2015/2016 fishing season amounted to 117 t, 87% of which was taken by demersal trawls.

Spiny dogfish (spurdog)

A few hundred tonnes of spiny dogfishes were fished annually by foreign fleets when they operated in Icelandic waters. However, Icelandic catches have always been low, or around 100 tonnes in recent years. As spiny dogfish are an aggregating species, landings may be dominated by relatively few large hauls leading to large fluctuations in annual landings and/or survey results. There is no directed fishery for spiny dogfish and current catches are solely bycatch in other fisheries, primarily gillnet fisheries off the southern coast during the summer months. Although the abundance of spiny dogfish is low in Icelandic waters compared to many bony fishes, this is still the most common shark species. However, no information is available on the stock status of this species.

Greenland shark

Historically Greenland sharks (*Somniosus microcephalus*) were fished in Icelandic waters with the fishery reaching its peak in 1867 when 13,100 barrels of shark oil were exported. Later whale and then fuel oil became more available and commercial fisheries for Greenland shark ceased by about 1910. Greenland sharks are still targeted in small scale artisanal fisheries and is a periodic bycatch in bottom trawl fisheries. National landings in 2015 totalled 18 t with no specific changes or trends apparent in the annual landings data (MRI data provided to assessment team).

Interactions of bottom contact gear with benthic ecosystem

Interactions between fishing gears and the seabed are highly dependent on gear type with towed bottom gears such as demersal trawls and dredges having a greater impact than static gear such as longlines, set nets or pots. Of the total catch of haddock by the Icelandic fleet in the 2015/2016 fishing season, 48.9% was taken by bottom trawls, 39.4% by longlines and 10.4% by Danish seines; the remainder was made up of various gears including gillnets (0.7%), Nephrops trawls (0.3%), handlines (0.1%) and shrimp trawls (0.1%).

The Icelandic groundfish fishery is multispecies in nature with vessels simultaneously targeting numerous species; as such the effects of bottom contact fishing gears are not separable by species and thus are generally attributed to the fishery as a whole rather than to any species in particular. The most widely used bottom fishing gear in Icelandic waters are demersal otter trawls the effects of which are dependent on seabed and community type. Effects on large emergent epifauna are more significant than on smaller encrusting organisms with areas subject to regular hydrodynamic disturbance, such as winter storms in shallower areas also being more naturally resilient to fishing disturbance.

As previously discussed, the major bottom contact fishing gear used around Iceland are bottom trawls (demersal otter trawls). 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 bottom trawl effort (Figure 13). The reduction in the intensity and footprint of the bottom trawl fishery in recent years is also evidenced by a reduction in total fishing effort (Figure 14).

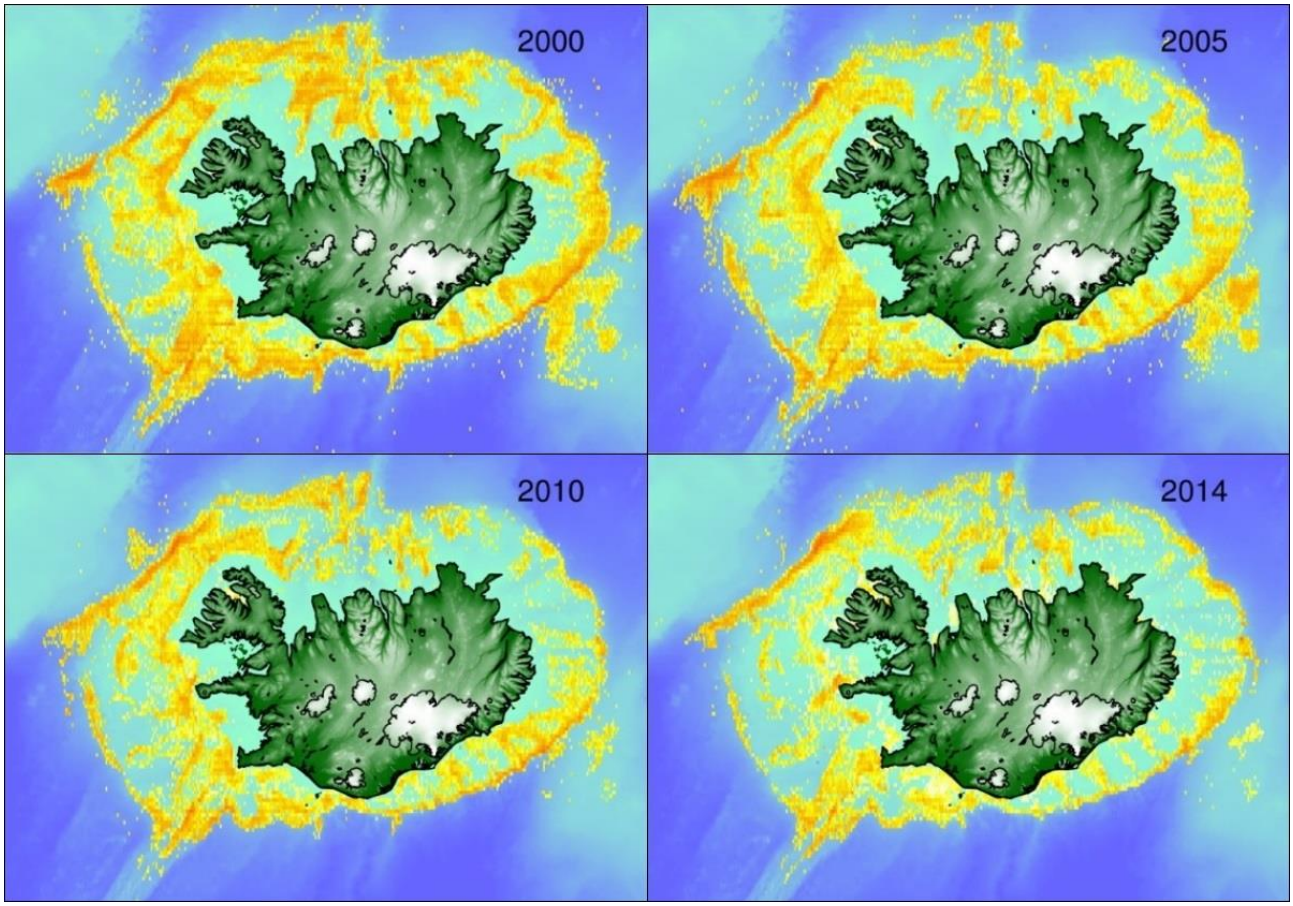

Figure 13. Spatial distribution of bottom-trawl effort based on logbooks from the trawl fishery targeting demersal fish, shrimp and Norway lobster.

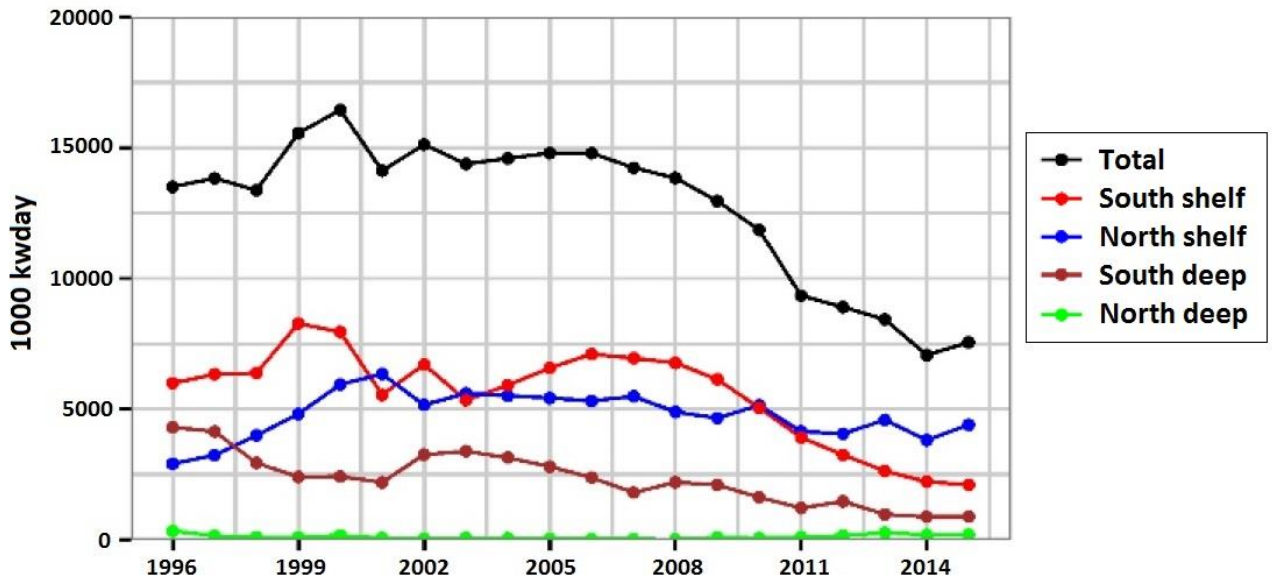

Figure 14. Annual total fishing effort (1000 kW days) for bottom-trawls targeting demersal fishes in the Icelandic ecoregion in 1994 – 2015 based on logbooks.

Protection of Vulnerable Marine Ecosystems (VMEs)

It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; sponge communities, coldwater corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Large areas within the Icelandic EEZ are closed, either temporarily or permanently, to fishing for a variety of reasons; these include the protection of juveniles, spawning fish and VMEs. Cumulatively approx. 58,000 km^2 of the 109,000 km^2 of Icelandic shelf area within which fishing activities occur is closed to bottom trawling. Furthermore, not all the fishable shelf areas outside closed areas are trawlable, as some parts of the seabed are unsuitable for trawl gear. While a closed area may be designed to protect one particular species/group of species within an ecosystem the benefits are not exclusive to that species and the closure may offer *de facto* protection to other ecosystem components. Therefore, while areas may not be specifically designed to benefit VMEs, with a total effective closed area in excess of 50% it is felt that suitable protection for VMEs is in place within the Icelandic EEZ.

Seabed mapping is a key aspect of this policy and is the remit of the MRI. 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. VMEs of particular importance within Icelandic waters are sponge and cold water coral communities and hydrothermal vent areas.

Sponge communities

Bycatch of sponges are recorded during bi-annual groundfish surveys allowing managers to estimate the distribution of mass sponge occurrences. 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 (total area of 45,290 km^2).
2. Several permanent regulatory fisheries closures outside of 12nm (total area 13,094 km^2) 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

Cold water coral communities

The coral water coral closures protect *Lophelia pertusa,* a species of cold-water coral which is extremely slow growing, associated with diverse communities and may be harmed by destructive fishing practices. In 2004 a research project mapped coral areas off Iceland and as a result 10 areas in to the southeast of Iceland were permanently closed to fishing.

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 and are fully protected by environmental law. 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.

Icelandic marine ecosystem and the haddock fishery

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 the recent years.

Interactions with Seabirds and Marine Mammals

The electronic logbook system designed by TrackWell allows for marine mammal and seabirds to be recorded along with normal catch. In total there are 171 marine mammal and seabird species pre-programmed into the e-log system that are selectable by fishers.

In a report on seabird and marine mammal bycatch in Icelandic fisheries, Pálsson *et al.,* (2015)[59] found that reports of seabird and marine mammal bycatch were very few in all gear types with the exception of gillnets. However, the report also stated that it has been reported that sea birds are attracted to the baited hooks in longline fisheries, and that seals and small whales occasionally get caught in bottom trawls. In an update provided to the assessment team MRI summarized records of seabird and marine mammal bycatch in the Icelandic longline and bottom trawl fisheries in 2014 and 2015 based on data from both onboard observers (representing approx. 1% coverage of the entire fleet) and records from the electronic monitoring system described above. This report suggests that, aside from cod gillnets, bycatch of seabirds and marine mammals in the major gear used to target haddock (i.e. bottom trawls and longlines) is likely to be minimal. The effects of longlines, bottom trawls and gillnets on marine mammals and seabirds are discussed below.

Seabird interactions

Pálsson *et al.,* (2015) reported that sea birds are occasionally attracted to the baited hooks in longline fisheries with seabird bycatch data from the Icelandic longline fishery being dominated by fulmars, with lesser bycatches of northern gannets, cormorants, black guillemots and great black-backed gulls. When these data were extrapolated to estimate the total number of seabirds bycaught in the longline fishery in 2014 and 2015 combined, the report concluded that in total an estimated 5,128 seabirds were caught corresponding to approx. 3 birds per million hooks set. The low level of seabird interactions in Icelandic longline fisheries is

[59] http://www.hafro.is/Bokasafn/Timarit/fjolrit-178.pdf

at least in part due to longliners' use of bird scaring devices, such as acoustic cannons and tori lines, and night setting in an effort to minimise interactions between seabirds and their gear.

Pálsson *et al.,* (2015) did not record any observations of seabirds in the bottom trawl fishery.

Pálsson *et al.* (2015) used data from the annual MRI cod gill net survey, which mimics fleet effort and represents approx. 2% of the total effort in the fishery, to estimate bycatches of seabirds in gillnets (excluding the lumpsucker fishery). The study found that seabird bycatch in gillnets was made up of 11 species and was dominated by common murre/guillemot and northern fulmar, both of which have a population of between 2 and 3 million individuals. Gillnets are not a major contributor to haddock catches.

Of the seabird species reported in the fishing gears used in the haddock fishery all, except for Atlantic puffin and long-tailed duck which are listed as vulnerable, are listed as species of least concern on the IUCN Redlist. However, while listed as vulnerable throughout its range, the Atlantic puffin is the most common seabird in Iceland with an estimated population of 2 to 3 million breeding pairs. Trends in the populations of seabird species around Iceland are thought to be primarily result from fluctuations in food availability. Given the numbers of seabirds caught compared to the overall populations and the level of natural variation in seabird populations as a result of environmental drivers it is unlikely that Icelandic haddock fisheries are having significant negative impacts on any seabird species.

Marine mammal interactions

The three main marine mammal species bycaught in Icelandic fisheries are harbour porpoises and harbour seals and grey seals. While the majority of marine mammal bycatches occur in gillnet fisheries there are also incidences of seal bycatches in bottom trawls; Pálsson *et al.,* (2015) did not report any incidences of marine mammal bycatches in Icelandic longline fisheries. Bycatches of marine mammals in Icelandic fisheries have generally been decreasing in line with a decrease in gillnet effort (Figure 15). Gillnets are not a major contributor to haddock catches.

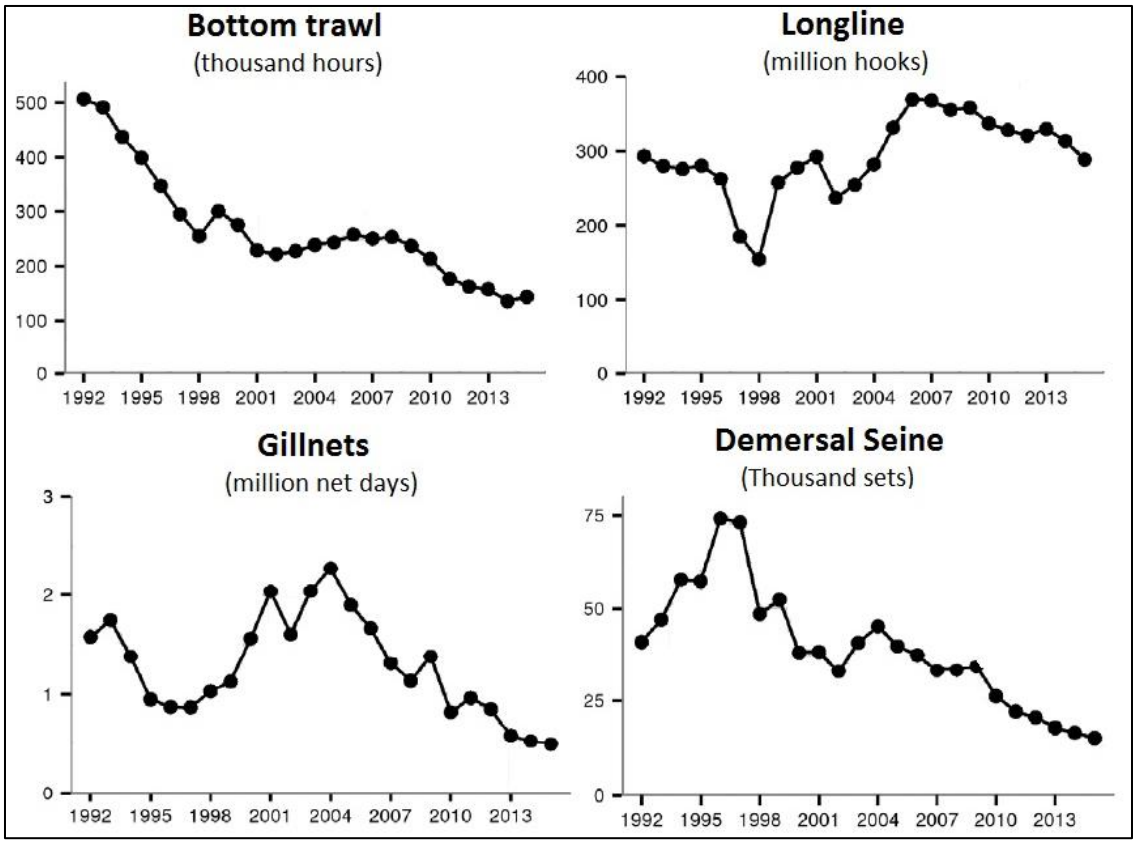

Figure 15. Temporal trends in effort by gear type since 1990 based on fishing vessel logbooks.

Seals

Only 2 species of seals are native to Iceland, grey seals (*Halichoerus grypus*) and common or harbour seals (*Phoca vitulina*). Greenland or harp seals (*Phagophilus groenlandicus*), ringed seals (*Phoca hispida*), and hooded seals (*Cystophora cristata*) are frequent guests in the winter, while bearded seals (*Erignathus barbatus*) and walruses (*Odobenus rosmarus*) are rarer. According to MRI (2016), traditional sealing has to a large extent ceased with seal bycatch also thought to have decreased in recent years. MRI (2016) provides information on marine mammal fisheries interactions in their annual report (MRI, 2016[60]). The 2016 report advised that reporting of all seal hunts should be mandatory and that surveys of seals should be conducted more regularly to allow for the evaluation of the current population status of seals.

Harbour seal

According to MRI (2016), the MRI will release advice based on the management objectives for harbour seals following analysis of data from the harbour seal census conducted in the summer of 2016. In 1980 the abundance of harbour seals was estimated at around 34,000 animals but the population declined rapidly until 1989 to around 15,000 animals. The latest survey of harbour seals was conducted in 2011 and the stock was estimated to be 11,000 – 12,000 animals (95% confidence intervals of 8,000 – 16,000). According to the 2011 survey, the population of harbour seals was under the management objective of 12,000 animals set by the government. A partial census conducted in 2014 showed further decrease in the population

Seal gillnet bycatch is high though it has likely decreased in recent decades. Limited data is available on seal bycatch but data collected by on board observers of the Directorate of Fisheries and from the gillnet survey indicates that around 40 harbour seals were caught annually in cod gillnets in 2010 to 2015. Annually around 340 harbour seals are estimated to be caught in the lumpfish fishery in the period 2013 – 2015 and around 43 seals annually in bottom trawls in 2014 and 2015. In 2015 catches of seals (including directed hunting) were approx. 2.3% – 4.4% of the latest estimates of the total population of harbour seals.

According to the MRI, as seal bycatch is thought to have decreased in recent years, the most plausible explanation for the continuing decline in the harbour seal population is culling in salmon river estuaries, and unrecorded sealing, with unfavourable environmental conditions also likely negatively affecting the population.

Grey seal

MRI will release advice based on the management objectives set for grey seals in Iceland only after a grey seal population census has taken place; no such survey is planned in 2016. The abundance of grey seals was estimated between 7,000 – 10,000 animals in the period 1982 – 1992. Abundance has since declined and was estimated at around 6000 animals in 1995 – 2008. The last survey in 2012 estimated the abundance around 4,200 animals (95% confidence intervals of 3,400 – 5,000). This estimate is slightly above the management objective of 4,100 animals set by the government.

Seal gillnet bycatch is high though it has likely decreased in recent years. Limited data is available on seal bycatch but data collected by on board observers of the Directorate of Fisheries and from the gillnet survey indicates that no grey seals were caught annually in cod gillnets in 2010 – 2015. Annually around 260 grey seals are estimated to be caught in the lumpfish fishery in the period 2013 – 2015 and no grey seals were caught in bottom trawls in the period 2014 and 2015. In 2015 catches of seals (including directed hunting) were approx. 7.3% – 10.7% of the latest estimate of the total population of grey seals; however this bycatch resulted almost exclusively from the lumpsucker gillnet fishery.

Harbour porpoise

As previously discussed, the annual MRI cod gill net survey mimics fleet effort and represents approx. 2% of the total effort in the fishery. The MRI uses data from their gillnet survey to estimate bycatches of marine

[60] http://www.hafro.is/Astand/2016/fjolrit_185.pdf

mammals in the fishery, with harbour porpoise being the most commonly bycaught marine mammal. Annual estimates of harbour porpoise bycatch have decreased in recent years in line with decreased gillnet effort, from a high of 7,300 animals in 2003 to 900 in 2015. The 2015 estimate of porpoise bycatch is 0.53% of the total estimated population from the last stock assessment of porpoises, based on aerial counts, which was conducted in 2007 (MRI, 2016).

Consistency of management of the fishery's ecosystem impacts with the precautionary approach.
Excerpt from the Iceland Responsible Fisheries Foundation Responsible Fisheries Management Standard Revision 2:
"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...."

As outlined above the most probable adverse impacts of the Icelandic haddock fishery 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 the case of the Icelandic haddock fishery the Assessment Team concludes that the consideration of the adverse impacts of the fishery on the ecosystem and resulting management actions are demonstrably consistent with the precautionary approach consistent with the provisions outlined in Article 31 of the 2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.

It is the determination of the Assessment Team that the Icelandic haddock fisheries are in full compliance with the revised Clause 3.1.1 contained in Revision 2 of the IRFF Responsible Fisheries Management Standard.

Clause 3.2 – Specific Criteria

Clause 3.2.1 – Information gathering and advice

Supporting Clauses:	3.2.1.1, 3.2.1.2			
Important Note:	Clause 3.2.1.2 is new to IRFM Standard Revision 2.0 and is scored separately in Appendix 2.			
Clause Guidance:	***Information shall be available on fishing gear used in the fishery, including the fishing gears' selectivity and its potential impact on the ecosystem. Stocks of non-target species commonly caught in the fisheries for the stock under consideration may be monitored and their state assessed as appropriate.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Information is available on 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. Clause 3.2.1.2 is new to IRFM Standard Revision 2.0 and is scored separately in Appendix 2.

EVIDENCE

There is information available on the legal specification of fishing gear in the Icelandic groundfish fishery. The primary aim of fishing gear regulations is size selectivity of the gear with a secondary aim being species selectivity. Gears are regulated in several ways to regulate both size and species selectivity. In the mixed groundfish fishery, the minimum mesh size is 135 mm, the largest minimum mesh size in the north Atlantic. Even with a minimum mesh size of 135 mm small and immature fish may be retained by the gear. In order to further reduce the risk of unwanted bycatch a range of selectivity devices has been developed; these devices generally consist of sorting grids and/or square mesh panels that exclude bycatch larger than the target species. Additionally, longliners in Iceland are obliged to use protective devices to shield baited hooks as gears are shot in order to prevent encounters with seabirds. Fishermen tend to use automatic gas guns and night settings (i.e. haul gear at night minimizing seabird interaction), generally in the winter period. The requirement follows Regulation 456 issued in 1994.

The MRI routinely conducts selectivity experiments to assess the performance of the main fishing gears and to assess ways in which selectivity might be improved. While MRI studies have shown codend selection to be appropriate, there has been a shift in the types of materials used to construct the trawls which may potentially impact the trawls performance when it comes to excluding unwanted catches. 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 MRI provides annual catch advice for 35 different species, while catch statistics are routinely collected and publically available for many more. See discussion and figures relating to retained species in clause 3.1 for further details.

Clause 3.2.2 – By-catch and discards

Supporting Clauses:	3.2.2.1, 3.2.2.2, 3.2.2.3, 3.2.2.4, 3.2.2.5			
Important Note:	Clause 3.2.2.4 and Clause 3.2.2.5 are new to IRFM Standard Revision 2.0 and are scored separately in Appendix 2.			
Clause Guidance:	***Discarding, including discarding of catches from non-target commercial stocks, is prohibited. Where relevant, appropriate steps shall be taken to avoid, minimize or mitigate encounters with seabirds and marine mammals. Accordingly, 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 shall be taken.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Discarding, including discarding of catches from non-target commercial stocks, is prohibited. Non-target catches, including discards, of stocks other than the "stock under consideration", do not pose serious risks of depletion to these stocks. Clause 3.2.2.4 and Clause 3.2.2.5 are new to IRFM Standard Revision 2.0 and are scored separately in Appendix 2.

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. There has been one prosecution case of discarding witnessed by the Coast Guard in the last 10 years. Monitoring for compliance is a feature of the at sea inspectors and the Coast Guard.

Non-target catches, including discards, of stocks other than the stock under consideration, do not threaten these non-target stocks with serious risk of depletion. Details of this have been provided under clause 3.1.

As of February 2014, all interactions between fishing gears and marine mammals/seabirds including the number and species of the animal in question must be reported[61]. Bycatches of marine mammals and seabirds in Icelandic haddock fisheries do not pose serious risks of depletion to seabird/marine mammal stocks. Further information is provided under clause 3.1.

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

Clause 3.2.3 – Habitat Considerations

Supporting Clauses:	3.2.3.1, 3.2.3.2, 3.2.3.3, 3.2.3.4			
Important Note:	No changes to Clauses in IRFM Standard Revision 2.0.			
Clause Guidance:	***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. Management measures must take into account and protect through closures significant continuous stony coral areas, identified through scientific and formal methods. Known thermal vents shall be protected through area closures to fishing activities with gear that has significant bottom impact during normal operation.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The Icelandic authorities have implemented an extensive array of areal closures within the Icelandic EEZ. These include permanent, seasonal and periodic closures aimed at protecting both juvenile and spawning fish and are gear or fishery specific. 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. While the majority of temporary closures to protect juveniles are aimed at protecting cod, haddock and saithe, these closures are likely to have a conservation benefit for other species.

EVIDENCE

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. While the majority of temporary closures to protect juveniles are aimed at protecting cod, haddock and saithe, these closures are likely to have a conservation benefits for other species.

The effects of bottom contact fishing gears are subject to ongoing research by the MRI and have been subject to review). Garcia (2007) identified the most vulnerable habitats as those with long-lived benthic structures such as corals, sponge communities and maerl, all of which may act as keystone species for diverse benthic communities. To counter some of the potential adverse effect of bottom contact gear a variety of technical measures (minimum mesh sizes, sorting grids) and closed areas are in force. 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. For more information relating to closed areas within the Icelandic EEZ see supporting evidence for clause 3.1.

Clause 3.2.4 – Foodweb Considerations

Supporting Clauses:	3.2.4.1			
Important Note:	Old Clause "3.2.4 Considerations" has been split into "3.2.4 Foodweb Considerations" and "3.2.5 Precautionary Considerations" in IRFM Standard Revision 2.0 – Clause 3.2.4 Foodweb Considerations addressed separately here.			
Clause Guidance:	***If the stock under consideration is a key prey species in the ecosystem, the harvesting policy and management measures shall be directed to avoid severe adverse impacts on dependent predators.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The MRI has studied haddock, and its place in the ecosystem. Haddock are not a key prey species but a major predator, and the magnitude of the haddock stock is likely to have an inverse impact on capelin, herring and shrimp stocks.

EVIDENCE

There is a growing international focus on food web considerations in fisheries management; this is evidenced by the Marine Research Institute's involvement in the development of ecosystem based understanding of the relationship between multi-species stocks and other ecosystem components – a so called 'multi-species stock system and management approach'.

Haddock are not a key prey species in Icelandic food webs[62]. Unlike cod, haddock are not heavily reliant on capelin as a primary food source and are mainly benthivores i.e. feeding on a mix of bottom dwelling organisms that live in coarse sand or gravel sea beds. The diet of haddock varies with size, time of year, and area. Haddock feed mainly on worms, small molluscs, sea urchins and brittle stars, although if available they do feed on sandeel and capelin, although fish species are not considered as a significant component of their diet[63].

Management measures relevant to ecosystem effects of the fishery

As previously mentioned, for a variety of reasons large areas within the Icelandic EEZ are closed for fishing; various gear restrictions are also in effect. It is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; cold-water corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Known cold-water coral reefs and hydrothermal vents are protected through permanent closures. The MRI provides advice on closures to protect VMEs which are promptly processed within the Ministry of Industries and Innovation (Fisheries department).

[62] Jaworski, A., and Ragnarsson, S. A. 2006. Feeding habits of demersal fish in Icelandic waters: a multivariate approach. ICES Journal of Marine Science, 63: 1682-1694.

[63] http://firms.fao.org/firms/resource/10329/en

Clause 3.2.5 – Precautionary Considerations

Supporting Clauses:	3.2.5.1			
Important Note:	Old Clause "3.2.4 Considerations" has been split into "3.2.4 Foodweb Considerations" and "3.2.5 Precautionary Considerations" in IRFM Standard Revision 2.0 – Clause 3.2.5 Precautionary Considerations addressed separately here. Clause 3.2.5.1: Text added (**Bold**) in IRFM Standard Revision 2.0: "*Management plans shall be developed and implemented in a timely fashion for avoiding, minimizing or mitigating any ecosystem issues properly identified. These shall be based on risk analysis and scientific advice,* ***consistent with the precautionary approach,*** *as being of serious concern in the fishery in question."* Clause 3.2.5.1 (minor change) – consistency with precautionary approach specifically addressed below.			
Clause Guidance:	***Management plans shall be developed and implemented in a timely fashion for avoiding, minimizing or mitigating any ecosystem issues properly identified. These shall be based on risk analysis and scientific advice, consistent with the precautionary approach, as being of serious concern in the fishery in question.***			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Icelandic government policy exists to protect vulnerable marine ecosystems (VMEs; cold-water corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. An amendment to Act No 79/1997 on Fishing in Iceland's Exclusive Economic Zone provides for the prohibition of fishing activities with bottom-contacting gear to especially protect vulnerable benthic habitats.

EVIDENCE

Icelandic government policy aims to protect vulnerable marine ecosystems from significant adverse impact from bottom contacting gear and legislation exists to provide for the prohibition of fishing activities with bottom-contacting gear in areas where vulnerable ecosystems occur. The annual MRI advice book includes a specific section on the ecosystem impacts of Icelandic fisheries[64]. 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.

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.

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

[64] http://www.hafro.is/Astand/2016/vistkerfi_2016.pdf

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.

Finally, as previously discussed, it is the policy of the Icelandic government to protect vulnerable marine ecosystems (VMEs; cold-water corals and hydrothermal vents), from significant adverse impact from bottom contacting gear. Known cold-water coral reefs and hydrothermal vents are protected through permanent closures.

Consistency of management of the fishery's ecosystem impacts with the precautionary approach.
Excerpt from the Iceland Responsible Fisheries Foundation Responsible Fisheries Management Standard Revision 2:
"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...."

As outlined above the most probable adverse impacts of the Icelandic haddock fisheries are considered and those impacts likely to have serious consequences are addressed. In the case of the Icelandic haddock fisheries the Assessment Team concludes that the consideration of the adverse impacts of the fishery on the ecosystem and resulting management actions are demonstrably consistent with the precautionary approach consistent with the provisions outlined in Article 31 of the 2009 FAO Guidelines for Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries.

It is the determination of the Assessment Team that the Icelandic haddock fisheries is in full compliance with the revised Clause 3.1.1 contained in Revision 2 of the IRFF Responsible Fisheries Management Standard.

8. Performance specific to agreed corrective action plans

Not applicable.

9. Unclosed, new non-conformances and new corrective action plans

Not applicable.

10. Future Surveillance Actions

No specific future surveillance actions beyond those already required by the IRFF Responsible Fisheries Management Programme (i.e. annual surveillance).

11. Client signed acceptance of the action plan

Not applicable.

12. Recommendation and Determination

The assessment team recommends that the management system of the applicant fisheries, the Icelandic haddock (*Melanogrammus aeglefinus*) commercial fisheries under state management by the Icelandic Ministry of Industries and Innovation, fished directly by demersal trawl, long-line, gill net, Danish seine net, and hook and line by small vessel gear and indirectly by Nephrops trawls, shrimp trawls, pelagic trawls and purse seines, are granted continued certification.

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14. Appendix 1 – Assessment Team Bios

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd., is pleased to confirm 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.

Dankert Skagen, (Assessor)
Dankert has recently retired from the Institute of Marine Research (IMR), Bergen, where he worked for 22 years. His responsibilities included stock assessment, multispecies work, in particular in the North Sea, work connected to the introduction of the precautionary approach in fisheries and recently, on development of harvest control rules and management strategies. He was leader of the IMR research program for population dynamics and multispecies investigations in 1996-97 and for the development of new assessment tools for North-East arctic cod in 1998-99 and the assessment package TASACS in 2007-08. In addition, he has developed several programs for simulating harvest control rules that are commonly used in fisheries management today. Within ICES, he has participated in a wide range of working groups and been chairman of several of them, including the Study Group of Management Strategies. He was chairman of the Resource Management Committee for 3 years and member of ACFM for 7 years.

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.

15. Appendix 2 – New clauses in IRFM Standard Revision 2.0

15.1 Clause 1.1.5

Clause 1.1.5	Transparency in the fisheries management and related decision-making process shall be ensured.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Management arrangements and decision making processes are organized in such a way so as to ensure transparency.

EVIDENCE

Icelandic fisheries management arrangements and decision making processes are organized in a very transparent manner. The roles, functions and responsibilities of the Ministry of Fisheries and Agriculture, Directorate of Fisheries, Coastguard and MRI are all set out clearly on their respective websites. Additionally, Iceland's small population ensures short chains of communication that in turn ensure that key issues affecting the fishing community are well understood by all affected parties. The Minister is required by legislation to consult the MRI before the setting of TAC. There is a consultation forum of utilised fish stock has the aim of discussing current strategy and harvesting based on MRI's advice and propose necessary changes. Surveys reports and ICES[65] and MRI[66] books underpinning advice to the Minister as well as resulting regulations are all available online through the various organisations' web pages.

There are regular meetings between fishery managers and industry representatives, at the individual level, committees, seminars and conferences where all aspects of fisheries management are discussed. Industry are well represented by a number of industry bodies such as the National Association of Small Boat Owners, Iceland (NASBO)[67] and Fisheries Iceland[68].

As previously discussed, information on the catch quota of each vessel for each fish species, including quota transfers between vessels, is recorded in the official central database. Current quota share ad TAC allocations by species as well as running catch totals and remaining quota for the season for each vessel are freely available on the Directorates website.The publically accessible nature of information relating to ownership of quota ensures transparency and accountability within the management system.

Finally, where disputes arise that necessitate legal intervention these are reviewed in public through the Icelandic civil law legal system, including its district and supreme courts, and all findings are published on the internet.

It is the determination of the Assessment Team that management arrangements and decision making processes are organized in such a way that transparency is ensured; therefore the Icelandic haddock fisheries are in full compliance with Clause 1.1.5 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

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

[65] http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/smr-5614.pdf
[66] http://www.hafro.is/Astand/2016/fjolrit_185.pdf
[6767] http://smabatar.is/sida/7.shtml
[68] http://www.sfs.is/

15.2 Clause 1.1.6

Clause 1.1.6	Fisheries shall be regulated in such a way as to avoid the risk of conflict among fishers using different vessels gear and fishing methods. Where conflict arises appropriate venues and means shall be available for conflict resolution.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Fisheries are 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 are available for conflict resolution.

EVIDENCE

Vessels fishing in the longline fishery use lights and AIS transmitters on their buoys. These serve to make the location of set longlines more visible to other fleet sectors such as bottom trawlers thereby reducing gear conflict. There also strict rules on the marking of gillnets. Other measures such as spatial separation of fishing activities including the exclusion of bottom trawlers from fishing within 12nm of the coast further reduce the changes of conflicts between fleet sectors arising.

Iceland's small population and relatively small fishing community ensures short chains of communication that ensure conflicts can generally be resolved before they arise. There are regular meetings between fishery managers and industry representatives where all aspects of fisheries are discussed.

The Icelandic civil law legal system has strong foundations and long tradition. Its district courts and the supreme court deals with all disputes that arise within the system. Disputes are reviewed in public and all findings are published on the internet.

It is the determination of the Assessment Team that fisheries are regulated in such a way as to avoid the risk of conflict among fishers using different vessels gear and fishing methods and that where conflicts do arise appropriate venues and means are available for conflict resolution; therefore the Icelandic haddock fisheries are in full compliance with Clause 1.1.6 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

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

15.3 Clause 2.1.2

Clause 2.1.2	Laws and regulations concerning conservation and management measures shall be publicly available and effectively disseminated.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Laws and regulations concerning conservation and management measures are publicly available on the Ministry of Industries and Innovation website and are effectively disseminated through an online law gazette.

EVIDENCE

Laws and regulations concerning conservation and management measures are publicly available on the Ministry of Industries and Innovation website[69] and are effectively disseminated through an online law gazette[70,71].

Additionally all advice to managers relating to the status of commercial stocks which underpins decisions on TACs and other regulations is available. Harvest control rules are scrutinised on request by an independent scientific body (ICES) with reports being published online.

It is the determination of the Assessment Team that laws and regulations concerning conservation and management measures are publicly available and effectively disseminated; therefore the Icelandic haddock fisheries are in full compliance with Clause 2.1.2 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

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

[69] https://www.atvinnuvegaraduneyti.is/sjavarutvegs-og-landbunadarmal/log-og-reglugerdir/
[70] http://vefbirting.oddi.is/Raduneyti/stjorn_fiskveida_2016-17/index.html#20
[71] https://www.stjornartidindi.is/

15.4 Clause 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.[72]			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE
According to IRFF Standard Revision 2.0: ***"This clause is applicable to gillnets, traps and pots."***

In cases of gillnets, traps and pots left unattended at sea, there are regulations requiring that they are marked so that the owner can be identified.

EVIDENCE
In Iceland there are specific gear marking regulations for anchored bottom set nets targeting cod. These provisions are contained in Regulation No. 115 of 13 February 2006[73]. Paragraph 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)[74]
- 1012/2013, on fishing whelk in traps (Paragraph 5)[75]
- 1070/2015 the fishing of crabs in the inner Faxaflói (Paragraph 4)[76]
- 923/2010, Monkfish-fishing (Paragraph 4)[77]
- 449/2013 Regulation of equipment and nets fishing for trout (Paragraph 6)[78]

It is the determination of the Assessment Team that 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; therefore the Icelandic haddock fisheries are in full compliance with Clause 2.3.2.17 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

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

[72] This clause is applicable to gillnets, traps and pots.
[73] http://www.reglugerd.is/reglugerdir/allar/nr/115-2006
[74] http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/20032
[75] https://www.atvinnuvegaraduneyti.is/log-og-reglugerdir/sjavarutvegur---reglugerdir/ymsar-veidar-serveidileyfi/horpuskel/nr/7930
[76] http://www.reglugerd.is/reglugerdir/eftir-raduneytum/atvinnuvega--og-nyskopunarraduneyti/nr/19883
[77] https://www.atvinnuvegaraduneyti.is/log-og-reglugerdir/sjavarutvegur---reglugerdir/ymsar-veidar-serveidileyfi/ymsar-veidar/nr/7065
[78] http://www.reglugerd.is/reglugerdir/allar/nr/449-2013

15.5 Clause 3.2.1.2

Clause 3.2.1.2	Information shall be available on the potential effect of fishing on endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The IRFF Standard Revision 2.0 defines endangered, threatened and protected species (ETPs) as:
"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."

Therefore in the context of this certification scheme ETPs in Icelandic waters are limited to Atlantic halibut and some cold water coral species (*Lophelia pertusa*). Other species which might be considered vulnerable such as grey skate, spiny dogfish and marine mammal and seabird species are assessed under Clause 3.1.

Information is available on the potential effect of the haddock fishery on species designated as ETPs. The current status of ETPs is assessed annually and present in the MRI advice book.

EVIDENCE

In the context of the IRFF Standard Revision 2.0 endangered, threatened and protected species (ETPs) are those species recognised by Icelandic legislation and/or binding international agreements to which the Icelandic authorities are party and binding international agreements as applicable in Icelandic jurisdiction. ETPs in Icelandic waters are therefore limited to Atlantic halibut and some cold water coral species (*Lophelia pertusa*).

As discussed previously, discarding of fish species is prohibited and there is a statutory requirement for skippers to record both the capture of fish and non-fish species. The e-logbook system as well as paper logbooks for smaller vessels include provisions for such information to be recorded. Observations are also recorded by fishery inspectors aboard fishing vessels and during bottom trawl, gillnet and longline surveys undertaken by the MRI.

Atlantic halibut

Information is available to assess the status of Atlantic halibut on an annual basis. Results of the 2016 stock assessment of Atlantic halibut concluded that recruitment and biomass indices decreased rapidly between 1985 and 1992 and have remained low since. Additionally, survey catches of Atlantic halibut have predominantly been 3 – 5 year old immature fish. These age groups have been in decline for over 20 years, and it is evident that the stock has suffered a recruitment failure. It is therefore likely that the stock will remain low over the next years. In terms of catches of halibut in Icelandic fisheries around 2000 t of Atlantic halibut were landed annually from Icelandic waters in 1984 – 1991.

A steady decline in catch occurred from 1991 to 1997, after which the catch stabilized between 500 t and 800 t until the ban on targeted fishing in 2012 (Figure 16). In the years immediately preceding the 2012 regulation, a directed longline fishery for halibut was developing, coinciding with a sharp decline in the survey biomass index. Atlantic halibut is now only caught as bycatch in bottom gear all around the island. Currently, the halibut stock seems to be severely depleted (Figure 17), with very little recruitment into the spawning stock in recent years.

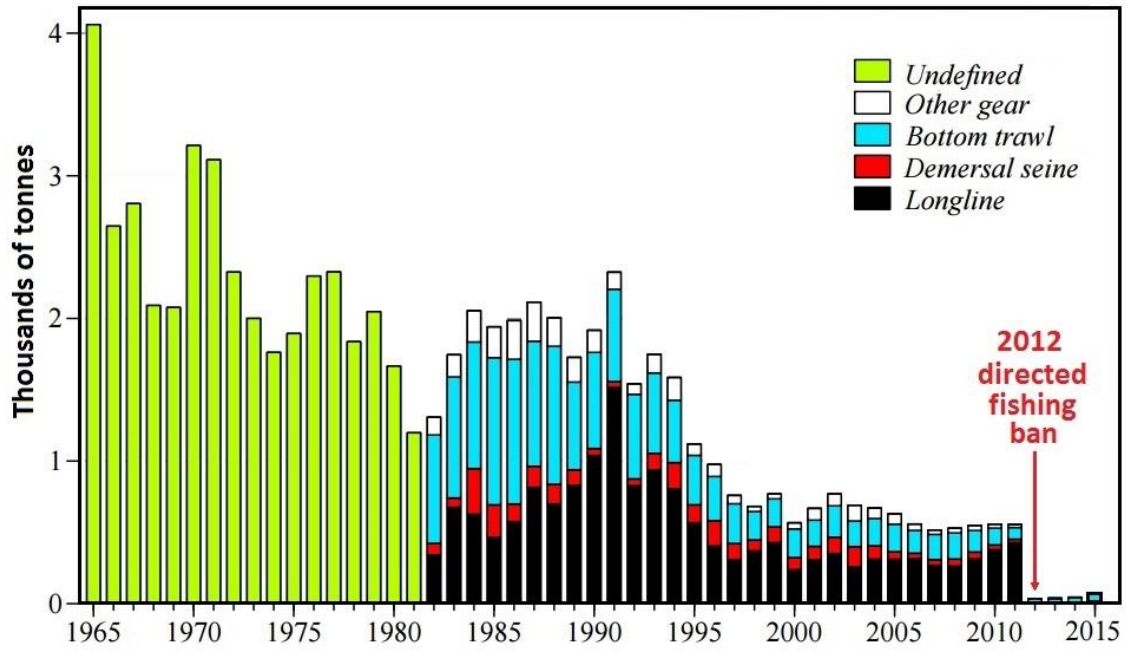

Figure 16. Landings of Atlantic halibut from 1960 to 2015 (split by gear type after 1982).

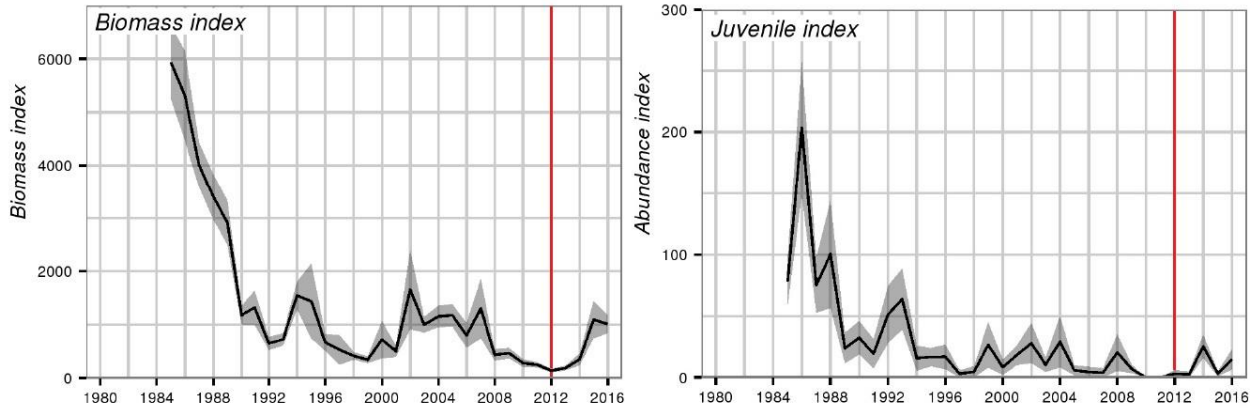

Figure 17. Biomass and juvenile indices form Icelandic bottom trawl surveys. Red line represents the year directed fishing for Atlantic halibut was prohibited.

Based on the spatial overlap of landings of haddock (2015) and Atlantic halibut (2000 – 2015) there is likely to be extremely limited impacts on the halibut stock as a result of directed fishing for haddock (Figure 18).

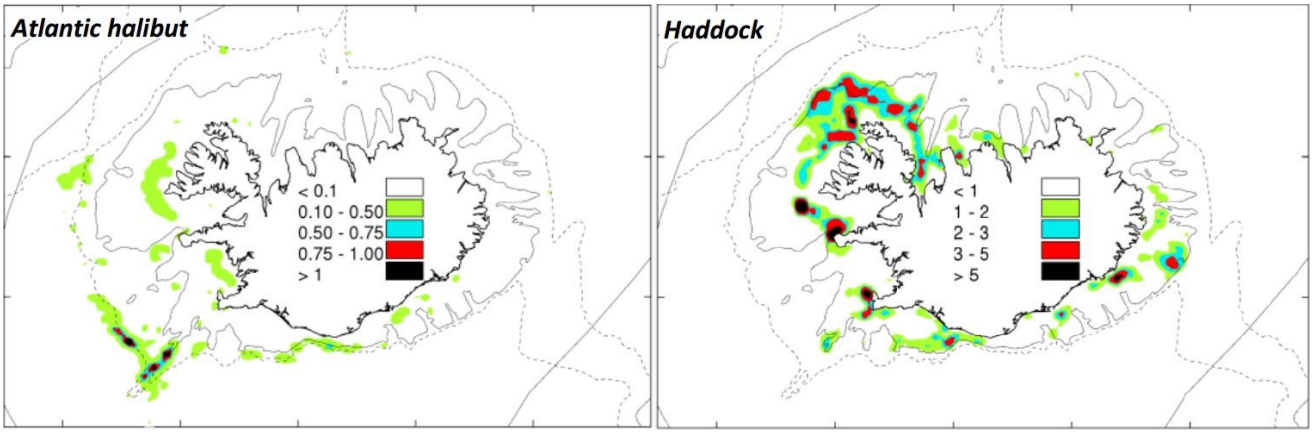

Figure 18. Fishing grounds for halibut (2000 – 2015) and haddock (2015) in Icelandic waters (t/nm^2).

Cold water coral (*Lophelia pertusa*)

The coral water coral closures protect *Lophelia pertusa,* a species of cold-water coral which is extremely slow growing, associated with diverse communities and may be harmed by destructive fishing practices. In 2004 a research project mapped coral areas off Iceland and as a result 10 areas in to the southeast of Iceland were permanently closed to fishing (Figure 19). The available data on fishing effort of the Icelandic fleet is very accurate and have made it possible to map in detail the distribution of trawl effort around Iceland. Research is ongoing aimed at mapping the distribution of benthic assemblages and habitats which are considered sensitive to disturbance by trawling.

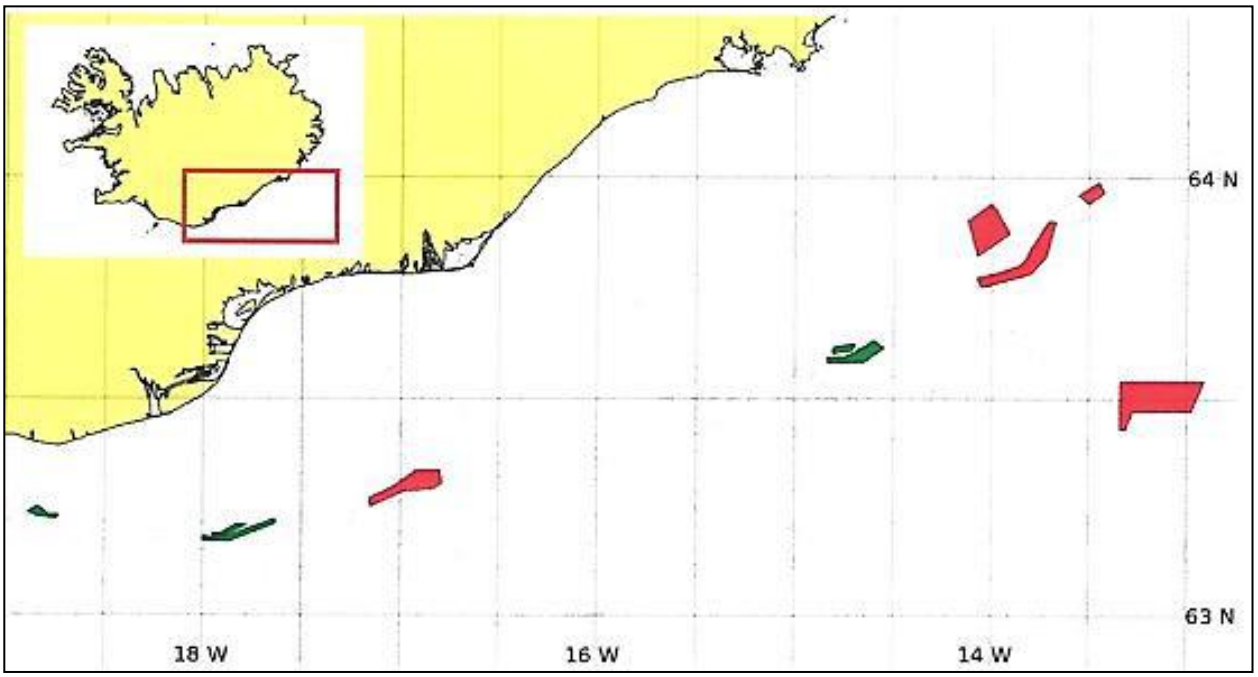

Figure 19. Location of closed areas for the protection of cold water corals in Icelandic waters.

It is the determination of the Assessment Team that sufficient information is available to allow the potential effects of the haddock fishery on species designated as ETPs to be determined; therefore the Icelandic haddock fisheries are in full compliance with Clause 3.2.1.2 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

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

15.6 Clause 3.2.2.4

Clause 3.2.2.4	Suitable steps shall be considered to avoid, minimize or mitigate encounters with endangered, threatened and protected species, as appropriate and relevant in the context of the unit of certification.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

The IRFF Standard Revision 2.0 defines endangered, threatened and protected species (ETPs) as:
"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."

Therefore in the context of this certification scheme ETPs in Icelandic waters are limited to Atlantic halibut and some cold water coral species (*Lophelia pertusa*). Other species which might be considered vulnerable such as grey skate, spiny dogfish and marine mammal and seabird species are assessed under Clause 3.1.

Suitable steps are considered to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of the Icelandic haddock commercial fisheries. Examples of mitigation measures include the ban on directed fishing for Atlantic halibut and the creation of permanently closed areas to protect known occurrences of vulnerable cold water corals (*Lophelia pertusa*).

EVIDENCE

Suitable steps are considered to avoid, minimize or mitigate encounters with ETP species, as appropriate and relevant in the context of the Icelandic haddock commercial fisheries. In the context of this certification scheme ETPs in Icelandic waters are limited to Atlantic halibut and some cold water coral species (*Lophelia pertusa*). As discussed previously other species which might be considered vulnerable such as grey skate, spiny dogfish and marine mammal and seabird species are assessed under Clause 3.1. However, there are also mechanisms in place to mitigate adverse impacts on these species such as the use of acoustic cannons, tori lines and night setting in Icelandic longline fisheries to minimise interactions with vulnerable seabirds.

Atlantic halibut

A committee established in 2010, in response to the state of the Atlantic halibut stock as outlined in the supporting evidence for Clause 3.2.1.2 above, concluded that the most effective way to rebuild the stock would be to ban all targeted fishing and to make it mandatory to release all viable bycaught Atlantic halibut. Regulations to this effect were enacted in January 2012. It is now illegal to fish for Atlantic halibut and any bycaught specimens deemed to be viable must be returned to the sea immediately. Any fish that are not deemed to be viable must still be landed but these are treated outside of normal catches and fishers do not profit from their sale. The effects of these regulations on both landings and F_{proxy} can be seen in Figure 20(Left panel) with landings dropping from an average of approx. 500 t per annum to less than 100 t. In the current fisheries advice booklet MRI recommends that these regulations should be maintained until clear indications of improvement in the stock are evident. Total landings of Atlantic halibut in the 2015/2016 fishing season amounted to 117 t, 87% of which was taken by demersal trawls. Figure 17 also shows some tentative signs of recovery in response to the ban on commercial fishing however it is much too early to determine if this is in fact the case.

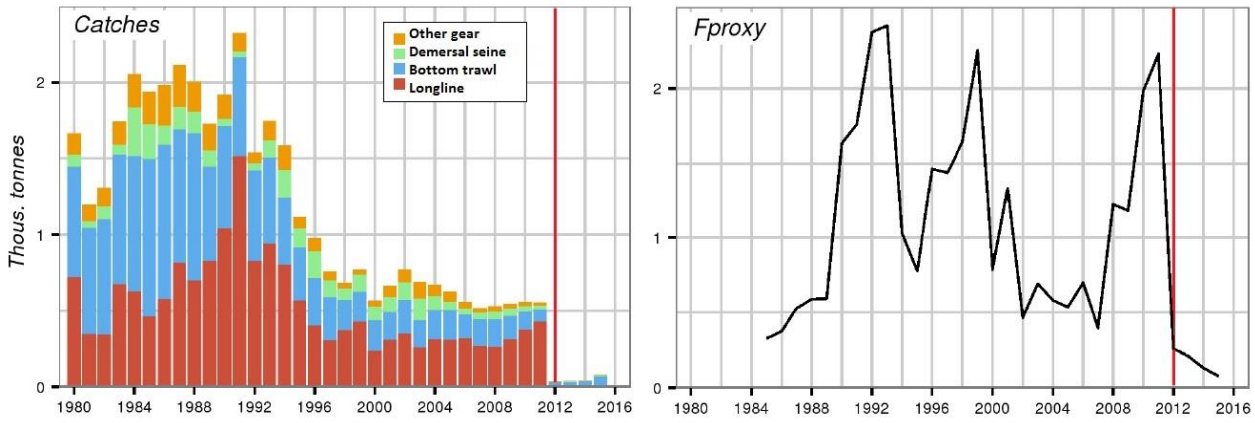

Figure 20. (Left Panel) Landings of Atlantic halibut from 1980 to 2015 split by gear type; (Right Panel) Index of F_{proxy} (catch/survey biomass) in the Icelandic groundfish survey. Red line represents the year directed fishing for Atlantic halibut was prohibited.

Cold water coral (*Lophelia pertusa*)

The coral water coral closures represent 10 areas in to the southeast of Iceland that are permanently closed to fishing specifically for the protection of *Lophelia pertusa* (Figure 19)**.** *L. pertusa* is a species of cold-water coral which is extremely slow growing, associated with diverse communities and may be harmed by destructive fishing practices. While these permanently closed areas protect known occurrences of *Lophelia pertusa* further mapping of the Icelandic seabed is continually undertaken to determine whether there are other similar areas/species in need of such protection. The available data on fishing effort of the Icelandic fleet is very accurate and have made it possible to map in detail the distribution of trawl effort around Iceland.

It is the determination of the Assessment Team that, where appropriate and relevant in the context of the Icelandic haddock commercial fisheries, suitable steps are considered to avoid, minimize or mitigate encounters with ETP species; therefore the Icelandic haddock fisheries are in full compliance with Clause 3.2.2.4 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.

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

15.7 Clause 3.2.2.5

Clause 3.2.2.5	Appropriate steps shall be taken to avoid the loss of fishing gear and ghost fishing of lost and abandoned gear.			
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

SUMMARY EVIDENCE

Appropriate steps are taken to avoid the loss of fishing gear and ghost fishing of lost and abandoned gear 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. Additionally, the Icelandic ITQ system operates in such a way that gear loses are minimised.

EVIDENCE

There are a number of initiatives and regulations in place to avoid the loss of fishing gear and subsequent ghost fishing of lost and abandoned gear. 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 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 (pers. comms. site visit, August 2016). All regulations relating to fishing gear may be found in the various Articles of Fisheries Management 2016/2017 Laws and regulations[79].

In the case of gillnets fishers are required to attend their nets at regular intervals and retrieve them before going ashore. According to Article 4 of Act 57/1996, concerning the Treatment of Commercial Marine Stocks (Translated from Icelandic); *"Nets and other gear, which are left in the sea, must be drawn on an appropriate and regular basis as circumstances allow. The Fisheries Directorate may remove, or have removed gears that are not been looked after properly. The same applies to fishing gear remaining in the sea after the end of fishing season, gears that are illegal or gears deployed in areas where their use is prohibited. The Directorate shall demand that the owners of fishing gear, removed from the sea by authority in paragraph 2 pay the costs associated with their removal. If the owner of the fishing gear is not known, the Directorate may sell the gear and the profit goes to the MRI."* This means that gear is not left out in inclement weather conditions that might lead to increased gear loses.

With respect to static gear fisheries for invertebrates, Article 4 of Regulation 1012/2013, on fishing whelk in traps and Regulation 1070/2015, the fishing of crabs in the inner Faxaflói both include specific provisions to prevent ghost fishing by lost whelk and crab traps respectively. Both of these Regulations require mechanisms be built into the trap to prevent it from continuing to fish indefinitely if lost (i.e. biodegradable panels).

Another important factor that contributes to low levels of lost fishing gear is the high price of that gear. This means that fishers are very 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 situation which is extremely rare.

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; this has also been seen to be the case in the Alaskan Bering Sea crab fisheries post-rationalisation.

[79] http://vefbirting.oddi.is/Raduneyti/stjorn_fiskveida_2016-17/index.html#20

It is the determination of the Assessment Team that, appropriate steps are taken to avoid the loss of fishing gear and ghost fishing of lost and abandoned gear; therefore the Icelandic haddock fisheries are in full compliance with Clause 3.2.2.5 of Revision 2.0 of the IRFF Responsible Fisheries Management Standard.	
Non-Conformance Number (if relevant)	**NA**