FISHERY ASSESSMENT REPORT

IFFO GLOBAL STANDARD FOR RESPONSIBLE SUPPLY OF FISHMEAL AND FISH OIL

FISHERY:	**Atlanto-Scandian (Norwegian spring-spawning) herring, *Clupea harengus*. ICELAND**
LOCATION:	**Iceland - Northeast Atlantic ICES Division Va, ICES Division Vb, ICES Sub Area IIa, ICES Sub Area IIb, ICES Sub Area IVa**
DATE OF REPORT:	**December 2015**
ASSESSOR:	**Deirdre Hoare**

1. APPLICATION DETAILS AND SUMMARY OF THE ASSESSMENT OUTCOME			
Name: Icelandic Association of Fishmeal Manufacturers			
Address:			
Country: Iceland		**Zip:**	
Tel. No.		**Fax. No.**	
Email address:		**Applicant Code**	
Key Contact:		**Title:**	
Certification Body Details			
Name of Certification Body:	**SAI Global (Ireland)**		
Assessor Name	**Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-certification**
Deirdre Hoare	Giles Bartlett	3	Surveillance
Assessment Period	2015		
Scope Details			
1. Scope of Assessment	IFFO Global Standard for Responsible Supply – Issue 1		
2. Fishery	Icelandic Atlanto-scandian herring (*Clupea harengus*)		
3. Fishery Location	Northeast Atlantic ICES Division Va, ICES Division Vb, ICES Sub Area IIa, ICES Sub Area IIb, ICES Sub Area IVa		
4. Fishery Method	Purse Seine nets, Midwater pelagic trawls		
Outcome of Assessment			
5. Overall Fishery Compliance Rating	Medium		
6. Sub Components of Low Compliance	None		
7. Information deficiency	None		
8. Peer Review Evaluation	Maintain approval		
9. Recommendation	Maintain approval		

2. QUALITY OF INFORMATION

Good; primarily government and ICES websites and reports

3. COMPLIANCE LEVEL ACHEIVED

Medium

Recommendation

Maintain approval

4. GUIDANCE FOR ONSITE ASSESSMENT

None

Based on HIGH compliance findings

A

Based on MEDIUM compliance findings

Based on LOW compliance findings

5. ASSESSMENT DETERMINATION

In general, the management of the international Norwegian spring-spawning herring fishery remains unchanged from the 2013 re-assessment. However, at the time of that assessment unilateral quota-setting by the Faroes had led to a total international TAC somewhat above the level implied by the management plan, and approval was granted only because it remained below the other TAC options recommended by ICES. In 2014 and 2015 this has occurred again, with no agreement being reached and unilateral quotas set. The October 2013 ICES advice concluded that even a 0t international TAC would likely result in SSB falling below Bpa in 2015, although the international management plan (which has been assessed by ICES as adherent to the precautionary approach) does not require the cessation of fishing under these circumstances. The end result is that the total international quota was set at 328,000t compared to ICES advice of 283,000t. However, as this TAC remains within the range of options provided by ICES (and is significantly below the level implied by an MSY-based approach, 367,000t), the assessment team recommends maintaining the approval of this fishery at a medium compliance level at this time.

HIGH Compliance

A1, A2, B1, D2, E1, E2

MEDIUM Compliance

A3, B2, C1, D1, D3

LOW Compliance

SUMMARY OF LEVEL OF COMPLIANCE

	The Management Framework and Procedures	Stock assessment procedures and management advice	Precautionary approach	Management measures	Implementation
legal and administrative basis	A1				
Fisheries management should be concerned with the whole stock unit	A2				
Management actions should be scientifically based	A3				
Research in support of fisheries conservation and management should exist		B1			
Best scientific evidence available should be taken into account when designing conservation and management measures		B2			
The precautionary approach is applied in the formulation of management plans			C1		
The level of fishing permitted should be set according to management advice given by research organisations				D1	
Where excess fishing capacity exist, mechanisms should be in established to reduced capacity				D2	
Management measures should ensure that fishing gear and fishing practices do not have a significant impact on non-target species and the physical environment				D3	
A framework for sanctions of violation of laws and regulations should be efficiently exists					E1
A management system for fisheries control and enforcement should be established					E2

KEY: Low Compliance: Medium Compliance: High Compliance:

6. RATIONALE OF THE ASSESSMENT OUTCOME

A. THE MANAGEMENT FRAMEWORK AND PROCEDURE

LEVEL OF COMPLIANCE	
A1. The management of the fishery must include a legal and administrative basis for the implementation of measures and controls to support the conservation of the fishery.	
LOW	An administrative framework that ensures an efficient management of the fishery for its conservation is not established.
MEDIUM	An administrative framework that ensures an efficient management of the fishery for its conservation is somehow established, but there is evidence of not being efficient to ensure the conservation of the stock.
HIGH	A legal and administrative framework that ensures an efficient management of the fishery for its conservation is established and works efficiently toward the conservation of the stock.

Determination: There have been no substantial changes to the Icelandic fisheries management system, and so a high compliance rating remains appropriate.

Modern Icelandic fisheries management is based on the Fisheries Management Act of 1990, and is the responsibility of the Ministry of Fisheries and Agriculture. The objectives of the Fisheries Management Act are to promote the conservation and efficient utilisation of the marine resources and thus to ensure stable employment and economic viability of fishing communities. The most recent version of the Fisheries Management Act was published in 2006 and includes:

• A commitment to the conservation and efficient utilisation of Icelandic fishery resources (Article 1).

• A commitment to set an annual TAC for each species "for which it is deemed necessary to limit the catch" (Article 3).

• A requirement for all commercial fishers to obtain a general fishing permit; vessels not fishing for an entire 12 month period will have their permit revoked (Article 4).

• An outline of the ITQ quota system (described in more detail in section D2, below) (Article 8).

• An outline of the methodology and responsibility for enforcement and monitoring of fishery regulations (Articles 17 & 18).

• An outline of penalties for transgressions (Articles 24 – 27). Iceland's national fisheries science organisation is the Marine Research Institute (MRI). The MRI carries out wide ranging and extensive research on the status and productivity of the commercial stocks, and long-term research on the marine environment and the ecosystem around Iceland. For more detail on the legal and administrative framework for fisheries management in Iceland, please refer to the 2013 re-assessment (R1).

R1

LEVEL OF COMPLIANCE	
A2. Fisheries management should be concerned with the whole stock unit over its entire area of distribution and take into account fishery removals and the biology of the species.	
LOW	Fisheries management is not concerned with the whole stock unit over its entire area of distribution and do not take into account any of the matters listed in 'A1'.
MEDIUM	Fisheries management is concerned with matters listed in 'A1' but not entirely. Fisheries, in relation to 'A1'

	statement, should improve to ensure the long term conservation of the marine resource.
HIGH	Fisheries management should be concerned with the whole stock unit over its entire area of distribution and take into account: • All fishery removals • The biology of the species

Determination: There have been no changes to the management unit nor the scientific understanding of the biological stock. The biology of the species and all available fishery removals data are included in the assessment process.

The Norwegian spring-spawning herring stock is the largest herring stock in the world. It is widely distributed and highly migratory throughout large parts of the NE Atlantic during its lifespan. Juveniles of the stock have their nurseries in Division Ia, but by far the majority of the stock occurs in Divisions IIa,b Va,b and XIVa. As a wide-ranging stock the ICES stock assessment and advice applies to the population wherever it is found, and the management process reflects this approach. The annual ICES stock assessment includes consideration of fishery removals reported by all states participating in the targeted fishery: Denmark, Faroe Islands, Germany, Iceland, Ireland, The Netherlands, Norway, Russia, Greenland and Scotland. Discard data are not available to ICES but the level of discarding in the fishery is considered to be low. For more detail on the biological and management definitions of the stock, including maps of fishing locations, please refer to the 2013 re-assessment (R1).

R1.

LEVEL OF COMPLIANCE	
A3. Management actions should be based on long-term conservation objectives	
LOW	Management actions are not based on long term management objectives.
MEDIUM	Management actions are based on long term management objectives. However the actions are not scientifically formulated.
HIGH	Management actions are based on long term management objectives, and actions are science based.

Determination: The international management plan identified in the re-assessment remains in place; however, unilateral quota-setting has led to total international TACs in excess of the level implied by the plan in recent years, and a medium compliance level is appropriate.

Management of the Atlanto-scandian spring-spawning herring stock is guided primarily by the international management plan agreed between the EU, Faroe Islands, Iceland, Norway, and Russia in 1999. The main components of the plan are to maintain SSB above 2,500,000t; to maintain a fishing mortality rate of less than 0.125; to reduce the target fishing mortality rate whenever SSB falls below 5,000,000t. In general the total international TAC has matched that implied by the harvest control rules set out in this management plan, although unilateral action by the Faroes and Norway has led to the TAC exceeding the plan in recent years (see section D1). The most recent ICES advice indicates that SSB has fallen below Bpa, although F remains very close to FMSY. In 2013, 2014 and 2015 there was no international agreement on TAC and total unilateral quotas exceeded the level implied by the management plan; however this is covered in section D1.

B. STOCK ASSESSMENT PROCEDURES AND MANAGEMENT ADVICE

LEVEL OF COMPLIANCE	
B1. Research in support of fisheries conservation and management should exist.	
LOW	Research to support the conservation and management of the stock, non-target species and physical environment does not exist
MEDIUM	Research to support the conservation and the management of the stock, non-target species and physical environment exists, however research programmes could be significantly improved to decrease scientific advice uncertainty.
HIGH	Research to support the conservation and the management of the stock, non-target species and physical environment exist, and existent research is considered most adequate for the long term conservation of the target,

	non-target and physical environment

Determination: The data collection and stock assessment activities identified in the 2013 re-assessment remain in place and effective.

Data on spring-spawning herring have been collected for over 100 years, and the results of stock assessments are available as far back as 1907. An annual stock assessment is now carried out by ICES and used to inform decisions made by fishery managers. The ICES assessments utilise a number of fishery-dependent (including landings, age, length and CPUE data) and –independent (including 8 survey indices, 5 of which are active) data sources to provide a range of management recommendations to the nations prosecuting the fishery using an age-based analytical model.

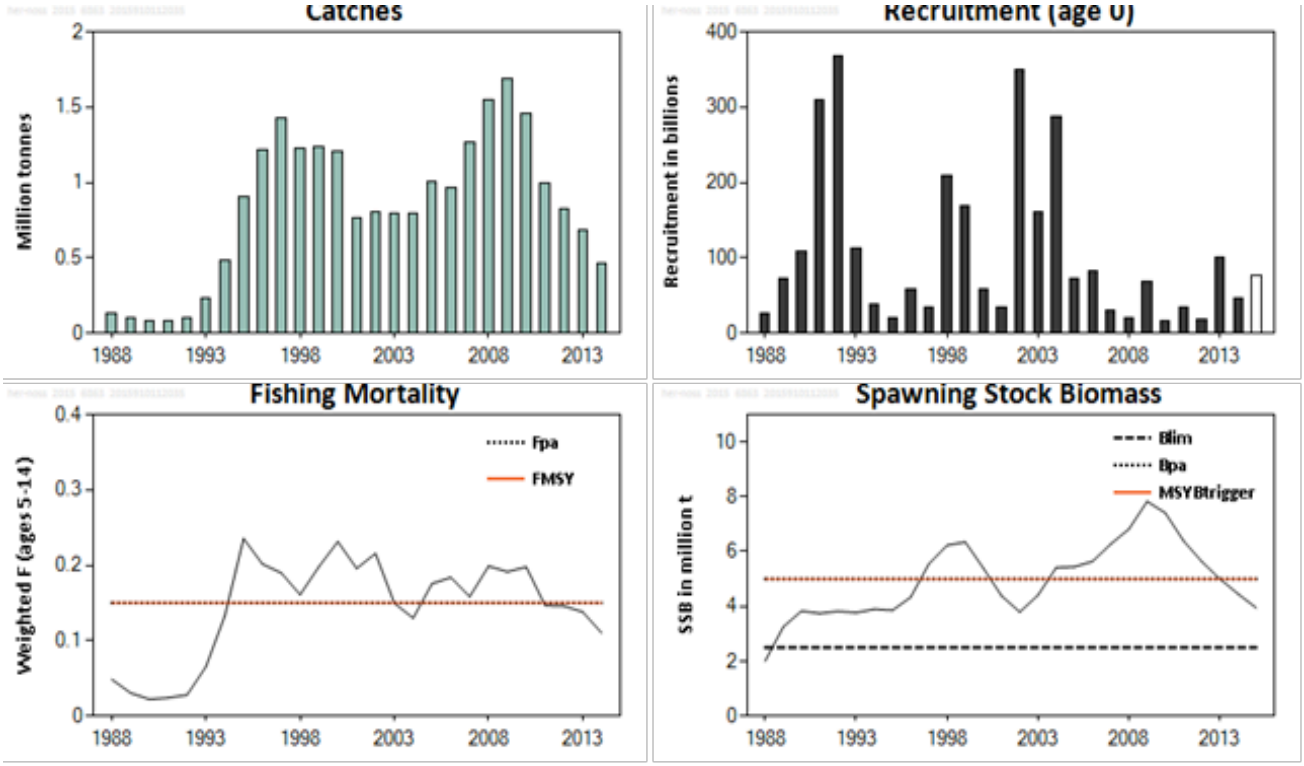

Figure 1. **Herring in Subareas I, II, and V and Divisions IVa and XIVa. Summary of stock assessment (weights in million tonnes). Predicted values are not shaded. ICES advice 2015 (R2)**

For more detail on the data collected to inform management of the spring-spawning herring fishery, please refer to the 2013 re-assessment (R1).

R1- R2

LEVEL OF COMPLIANCE	
B2. Best scientific evidence available should be taken into account when designing conservation and management measures.	
LOW	Scientific advice is not taken into account when designing conservation and management measures.
MEDIUM	Scientific advice is taken into account, when designing conservation and management measures. However some areas of discrepancy are identified that could have a significant impact in the long term conservation of the marine environment.
HIGH	Scientific advice is taken into account, when designing conservation and management measures, in a comprehensively manner.

Determination: Management of the fishery continues to be informed by ICES internationally, and by the MRI at the Icelandic national level. The assessment team recommends the reduction of the compliance rating of this section from high to medium to reflect the disparity between total international TAC and ICES advice in recent years.

International and Icelandic national management of the fishery is informed primarily by annual ICES stock assessment and advice, but also by the Marine Research Institute (MRI) of Iceland. The primary technical measure for the fishery is the setting of a total international TAC, which is then divided between nations involved during an annual negotiation. The division of the TAC between countries has been based on distribution of the stock, historical catches, contribution to scientific research and the nation's dependency on fisheries. Additional agreements are in place to allow nations to take a certain percentage of their catch in each other's EEZ. Each country retains control over the distribution of its share of the TAC within its fishing fleet. With few exceptions, Icelandic fisheries are subject to a 'no discards' rule. Minimum mesh sizes are also in place in all Icelandic fisheries, partially to minimise the impact of the no-discards rule on smaller individuals. Finally, although there do not appear to be any such areas in place for the Atlanto-Scandian stock, Icelandic fishery managers have implemented closed areas in herring fisheries in response to scientific advice. In recent years there has been a failure to reach a universal agreement on international TAC sharing, and as such the final annual quota has totalled more than that advised by ICES. Although this issue is covered in detail in section D1, it does represent a failure to adhere to scientific advice.

R1, R2.

C. THE PRECAUTIONARY APPROACH

LEVEL OF COMPLIANCE	
C1. The precautionary approach is applied in the formulation of management plans.	
LOW	The precautionary approach is not applied in the formulation of management plans.
MEDIUM	The precautionary approach is applied, however not all uncertainties are taken into account.
HIGH	The precautionary approach is applied, taking into account uncertainties relating to the dynamic of fish population (recruitment, mortality, growth and fecundity), and the impact of the fishing activities, such as discards and by-catch of non-target species as well as on the physical environment (Habitats).

Determination: The precautionary management plan identified in the previous assessment remains in place. SSB was estimated in 2014 to be below Bpa. Although this is due primarily to the failure to reach an international agreement on TAC, a situation reflected in the compliance ratings of sections B2 and D1, it is appropriate to also reflect it with a medium compliance in this section.

The long-term international management plan described in section B2 has been assessed by ICES and found to be in line with the precautionary approach. Reference points for the stock were last updated in 2010; the target fishing mortality associated with the management plan (F = 0.125) is more conservative than the precautionary approach (F = 0.15).

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	5.0 million t	B_{pa}	
	F_{MSY}	0.15	Stochastic equilibrium analysis using a Beverton–Holt stock–recruitment relationship with data from 1950 to 2009.	ICES (2013a)
Precautionary approach	B_{lim}	2.5 million t	MBAL (accepted in 1998).	ICES (2013a)
	B_{pa}	5.0 million t	$B_{lim} \times \exp(0.4 \times 1.645)$.	ICES (2013a)
	F_{lim}	Not defined.	-	
	F_{pa}	0.15	Based on medium-term simulations.	ICES (2013a)
Management strategy	SSB_{MGT}	5.0 million t	Medium-term simulations conducted in 2001 and 2014.	ICES (2014)
	F_{MGT}	0.125	Medium-term simulations conducted in 2001 and 2014.	ICES (2014)

Figure 2. Herring in the North-East Atlantic – reference points. From the ICES advice, 2015 (R2).

D. MANAGEMENT MEASURES

LEVEL OF COMPLIANCE	
D1. The level of fishing permitted should be set according to management advice given by research organisations.	
LOW	The level of fishing permitted is not set according to management advice given by research organisations.
MEDIUM	The level of fishing permitted is higher than management advice given by research organisations. However, the difference is not considered to have a significant impact of the sustainability of the stock
HIGH	The level of fishing permitted is set according to management advice given by research organisations.

Determination: The 2013 and 2014 assessments noted that the total international TAC was set above the level implied by the management plan and that advised by ICES due to unilateral action by the Faroese government. Based on the information available to the assessment team, a similar situation has occurred in the setting of the 2015 quotas, due to Norway setting a unilateral TAC. The total remains within the range of recommendations made by ICES, the assessment team recommends maintaining a medium compliance rating under this clause.

Between 2007 and 2012, the total international TAC was set in line with the requirements of the management plan and the ICES advice. In the setting of the 2013 and 2014 quotas, the Faroese government withdrew from negotiations and set a unilateral TAC. The ICES recommendation for total international TAC in 2015, again based on the management plan, was 283,013t. According to the information available to the assessment team, the each government has set its own unilateral quota, leading to a total international TAC of 328,000t. However, this remains within the range of options provided by ICES in the advice for the 2015 fishing season, including being below the level implied by an MSY-based approach (367,000t).

Basis: $F_w(2014)^{1)} = 0.107$; SSB (2015) =3502 thousand tonnes; Recruitment (2014–2016) = 72 billions (geometric mean recruitment 1988–2009); Catches (2014) = 436 893 tonnes (= sum of declared national quotas).

Rationale	Catches (2015)	Basis	$F_w(2015)^{1)}$	SSB(2016)	% SSB change[2)]	% TAC change[3)]
Agreed management plan	283	F_{MP}	0.080	3192	−9	−32
MSY approach	367	$F_{MSY} \times (SSB_{2015}/MSY\ B_{trigger})$	0.105	3120	−11	−12
Zero catch[4)]	0	F = 0	0	3437	−2	−100
Other options	373	F_{2014}	0.107	3115	−11	−11
	512	F_{MSY}, F_{pa}	0.150	2995	−14	22

Catches and stock biomass weights in the table are in thousand tonnes.
1) F_w = Fishing mortality weighted by population numbers (age groups 5–14). $F_w > F_{MP}$ to account for expected catch in 2013.
2) SSB 2016 relative to SSB 2015.
3) Catches 2015 relative to TAC 2014.
4) Precautionary approach zero catch will not bring SSB above B_{pa} in 2016.

Figure 3. Norwegian spring-spawning herring landings recommendations for 2015, and their scientific basis. From the September 2014 ICES advice (R3).

Year	ICES advice	Predicted catch corresp. to advice	Agreed TAC	ICES catch
1987	TAC	150	115	127
1988	TAC	120–150	120	135
1989	TAC	100	100	104
1990	TAC	80	80	86
1991	No fishing from a biological point of view	0	76	85
1992	No fishing from a biological point of view	0	98	104
1993	No increase in F	119	200	232
1994	Gradual increase in F towards $F_{0.1}$; TAC suggested	334	450	479
1995	No increase in F	513	900*	906
1996	Keep SSB above 2.5 million t	-	1425*	1220
1997	Keep SSB above 2.5 million t	-	1500	1427
1998	Do not exceed the harvest control rule	-	1300	1223
1999	Do not exceed the harvest control rule	1263	1300	1235
2000	Do not exceed the harvest control rule	Max 1500	1250	1207
2001	Do not exceed the harvest control rule	753	850	766
2002	Do not exceed the harvest control rule	853	850	808
2003	Do not exceed the harvest control rule	710	711*	790
2004	Do not exceed the harvest control rule	825	825*	794
2005	Do not exceed the harvest control rule	890	1000*	1003
2006	Do not exceed the harvest control rule	732	967*	969
2007	Do not exceed the harvest control rule	1280	1280	1267
2008	Do not exceed the harvest control rule	1518	1518	1546
2009	Do not exceed the harvest control rule	1643	1642	1687
2010	Do not exceed the harvest control rule	1483	1483	1457
2011	See scenarios	988–1170	988	993
2012	Follow the management plan	833	833	826
2013	Follow the management plan	619	692*	685
2014	Follow the management plan	418	436*	461
2015	Follow the management plan	283	328*	
2016	Follow the management plan	≤ 316.876		

Weights in thousand tonnes.

* There was no agreement on the TAC; the number is the sum of autonomous quotas from the individual Parties.

Figure 4. Herring in Subareas I, II, and V, and in Divisions IVa and XIVa (Norwegian spring-spawning herring). ICES advice, management, and catches. From the September 2015 ICES advice (R2).

LEVEL OF COMPLIANCE	
D2. Where excess fishing capacity exist, mechanisms should be in established to reduced capacity to allow for the recovery of the stock to sustainable levels.	
LOW	Mechanisms to allow for recovery of the stock to sustainable levels are not established.
MEDIUM	Mechanisms to allow for recovery of the stock to sustainable levels are somehow established. However there is no evidence of the efficiency of the methods used.
HIGH	Mechanisms are established to reduce capacity to allow for the recovery of the stock to sustainable levels and there are evidences of recovery.

Determination: Annual quotas remain the primary mechanism for limiting fishing effort in Iceland. As there have been no major changes since the 2013 re-assessment, a high compliance rating remains appropriate.

The main instrument in Icelandic fisheries and fleet management is a system based on Individual Tradable Quota (ITQs), which has been in place in its current form since 1990. During the past 15 years there has been no specific fleet management system in Iceland; fishing licenses are readily available for anyone with a seaworthy vessel, and no decommissioning schemes are in place. Under the ITQ system, each vessel is allocated a certain share of the TAC of the relevant species. Decommissioning occurs indirectly, as companies increase their share of the TAC by buying out vessels and thus receiving the quota attached to those vessels.

R1

LEVEL OF COMPLIANCE	
D3. Management measures should ensure that fishing gear and fishing practices do not have a significant impact on non-target species and the physical environment.	
LOW	There are no management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment.
MEDIUM	There are management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment. However it is not science based.
HIGH	There are management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment. Measures are based on scientific information.

Determination: There have been no substantial changes in the level of information available with regards to the potential impacts of the fishery on non-target species and the physical environment, and so a medium compliance rating remains appropriate.

With a handful of minor exceptions, discarding is banned in Icelandic fisheries and so all bycatch is landed, and therefore recorded by MRI or government officials; however it is unclear whether bycatch of non-target species is reported to ICES or, if it is, the extent to which this is factored into management advice and decisions. ICES reports that there is little quantitative information on the non-target bycatches in Atlantic herring fisheries in general, but these are thought to be small. Icelandic legislation (557/2007) states that all fishing vessels must keep a Fishery Log-book. Birds and Mammals that are caught in fishing gear are to be reported and recorded in the Fishery Log-book. This Fishery Log-book is returned to the Directory of Fisheries once a month. These reports are then sent onto the MRI where the information is used in their scientific work; it is not clear whether this information is also submitted to ICES, nor the extent to which it is included in management recommendations. ICES does not currently consider the impact of the fishery on PET species to be significant. Information on the impact of the herring fishery on the ecosystem is limited. Unintended effects of the fishery on the ecosystem are considered by ICES to probably be small or absent. Since herring is a major source of food for some populations of other species, overfishing of the herring stock could affect these populations. Direct effects on habitat and seafloor are typically minimal for pelagic gears, although occasional contact is known to occur and, in these cases, can potentially cause damage to fragile ecosystems (e.g. corals).

R1.

E. IMPLEMENTATION

LEVEL OF COMPLIANCE	
E1. There should be a framework for sanctions of violation of Laws and regulations.	
LOW	A framework for sanctions of violation of Laws and regulations do not efficiently exist.
MEDIUM	A framework for sanctions of violation of Laws and regulations do exist but do not work efficiently.
HIGH	A framework for sanctions of violation of Laws and regulations exists and is proven to be efficient.

Determination: As at the time of the 2013 re-assessment, there is a robust framework in place for sanctioning violations of fishery laws and regulations in Iceland.

Breaches of the law and regulations on fisheries management are subject to fines or revoking of the fishing permit, irrespective of whether such conduct is by intent or negligence. Major or repeated intentional offenses are subject to up to six years imprisonment. If the catch of a vessel exceeds the allowable catch of the said

vessel of individual species, the relevant fishing company must obtain an additional catch quota for the relevant species. Penalties are outlined in Articles 24-27 of the Fisheries Management Act, including:

• Violations of the Act shall be prosecuted according to the Criminal Proceedings Act.

• Violations against the Act shall be liable to fines, and cases of serious or repeated deliberate violation shall be liable to imprisonment for up to six years.

• Fines may vary between ISK 400,000 (US$3,200) and ISK 8,000,000 (US$65,000), depending on the nature and scope, and whether it represents a repeat offence.

R1.

LEVEL OF COMPLIANCE	
E2. A management system for fisheries control and enforcement should be established.	
LOW	A management system for fisheries control and enforcement is not established.
MEDIUM	A management system for fisheries control and enforcement is established but do not work efficiently.
HIGH	A management system for fisheries control and enforcement is established and work efficiently.

Determination: Effective fisheries control and enforcement mechanisms remain in place in Icelandic fisheries.

Day to day administration and enforcement of the Fisheries Act and related legislation is in the hands of the Directorate of Fisheries, a government body responsible to the Minister of Fisheries. The Directorate is also responsible for the continuous monitoring of compliance with the Act. The Icelandic Coast Guard, responsible to the Minister of Justice, monitors fishing activities in Icelandic waters, including surveillance of areas closed for fishing and inspection of mesh sizes and other gear related practices. Under a bilateral agreement between Iceland and the European Union (EU), Icelandic inspectors are required on board all EU fishing vessels in Icelandic waters.

R1.

7. KEY STAKEHOLDERS

8. REFERENCES

R1 – IFFO RS Iceland Atlantic herring re-assessment April 2013: http://www.iffo.net/files/iffoweb/approvedraw-materials/whole-fish/iceland-atlanto-scandian-norwegian-spring-spawning.pdf

R2 – ICES advice, Norwegian spring-spawning herring, September 2015: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/her-noss.pdf

R3 - ICES advice, Norwegian spring-spawning herring, September 2014: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/her-noss.pdf