



FISHERY ASSESSMENT REPORT

IFFO GLOBAL STANDARD FOR RESPONSIBLE SUPPLY OF FISHMEAL AND FISH OIL



FISHERY:	Atlanto-Scandian (Norwegian spring-spawning) herring, <i>Clupea harengus</i> .
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:	10 th April 2013
ASSESSOR:	Sam Peacock

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Issue No; 2; Issue Date; Nov 09

Report Ref: NSSH Reapproval 2013

CCM Code:

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1. Application Details and Summary of the Assessment Outcome			
Name: Icelandic Association of Fishmeal Manufacturers			
Address:			
Country:		Zip:	
Tel. No.		Fax. No.	
Email address:		Applicant Code	
Key Contact:		Title:	
Certification Body Details			
Name of Certification Body: Global Trust Certification			
Assessor Name: Sam Peacock	Peer Reviewer: Mike Platt	Assessment Days: 10	Initial/Surveillance/Re-certification: Re-certification
Assessment Period	April – June 2013		
Scope Details			
1. Scope of Assessment:	IFFO Global Standard for Responsible Supply – Issue 1		
2. Fishery	Icelandic Atlanto-scandian herring (<i>Clupea harengus</i>)		
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/High		
6. Sub Components of Low Compliance	None		
7. Information deficiency	None		
8. Peer Review Evaluation	Agrees with the determination of the assessment but will state that approval will only be maintained if the agreed TAC does not go above the upper limits of the ICES advice		
9. Recommendation	Approve fishery		

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2. Quality of Information
Good, primarily ICES and Icelandic government websites.

3. Compliance Level Achieved
Medium/high
Recommendation
Approve fishery

4. Guidance for On-site Assessment
Based on High Compliance Findings
Based on Medium Compliance Findings
Key Stakeholders of the Fishery

5. Assessment Determination
<p>The Norwegian Spring-spawning herring fishery is subject to effective national and international research, management, and control and enforcement mechanisms. The primary management instrument is an internationally-agreed management plan which forms the basis for annual quota decisions, and sets target and limit reference points for the stock. Between 2007 and 2012, although poor recruitment led to falling biomass, the adherence to this plan meant the fishery was generally well-managed.</p> <p>The failure to reach an international agreement on a quota for 2013 has led to the combined national TACs for this year totalling somewhat higher than the level of fishing implied by the management plan. However, the total is below the TACs recommended by ICES as associated with both the precautionary and MSY-based approaches, and the assessment team considers that at this time the level of fishing pressure is not sufficient to prevent the stock from being approved. If in future assessments it is discovered that the total international TAC exceeds the upper recommendations of the ICES advice, approval for the fishery should be suspended. A full analysis of the situation is provided under section D1. A second medium compliance rating has been awarded due to the limited information available on the impacts of the fishery on non-target species.</p>
HIGH COMPLIANCE
A1, A2, A3, B1, B2, C1, D2, E1, E2
MEDIUM COMPLIANCE
D1, D3

Background

Herring is a coastal, pelagic, schooling species which can be found down to 200m. Individual herring stocks exhibit complex feeding and spawning migrations, the timing and extent of which are often used to define the stock. Herring feeds on small planktonic copepods in its first year, and thereafter mainly copepods, but also hyperid amphipods, euphausiids, mysid shrimps, small fishes, arrow-worms, ctenophores and pteropods.

Herring in the North Atlantic is split into many stocks, based on where and when they spawn. Atlanto-Scandian or Norwegian Spring-spawning herring is a stock with a high number of vertebrae, large size at age, large maximum size and large variation in year class strength. The herring spawns along the Norwegian west coast in February-April, although the precise location of spawning has varied considerably historically. High fishing mortality in the late 60's and early 70's lead to a population crash and extremely low biomass from around 1970 onwards. By 1990 the stock had recovered somewhat, and in 1999 an international management plan was agreed specifying harvest control rules, target and limit reference points. In recent years SSB has declined towards, but currently remains above, $B_{trigger}$.

Ref: 1, 2

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	High Compliance	Low Compliance	Low Compliance	Low Compliance	Low Compliance
Fisheries management should be concerned with the whole stock unit	High Compliance	Low Compliance	Low Compliance	Low Compliance	Low Compliance
Management actions should be scientifically based	High Compliance	Low Compliance	Low Compliance	Low Compliance	Low Compliance
Research in support of fisheries conservation and management should exist	Low Compliance	High Compliance	Low Compliance	Low Compliance	Low Compliance
Best scientific evidence available should be taken into account when designing conservation and management measures	Low Compliance	High Compliance	Low Compliance	Low Compliance	Low Compliance
The precautionary approach is applied in the formulation of management plans	Low Compliance	Low Compliance	High Compliance	Low Compliance	Low Compliance
The level of fishing permitted should be set according to management advice given by research organisations	Low Compliance	Low Compliance	Low Compliance	Low Compliance	Low Compliance
Where excess fishing capacity exist, mechanisms should be in established to reduced capacity	Low Compliance	Low Compliance	Low Compliance	High Compliance	Low Compliance
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 Compliance	Low Compliance	Low Compliance	Low Compliance	Low Compliance
A management system for fisheries control and enforcement should be established	Low Compliance	Low Compliance	Low Compliance	Low Compliance	High Compliance
A framework for sanctions of violation of laws and regulations should be efficiently exists	Low Compliance	Low Compliance	Low Compliance	Low Compliance	High Compliance

KEY: Low Compliance [Red Box] Medium Compliance [Yellow Box] High Compliance: [Green Box]

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6. Rationale of the Assessment Outcome

a. The Management Framework and Procedure

LEVEL OF COMPLIANCE	a.i. 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.	References	Rating
LOW	<i>Determination: Fisheries management in Iceland is based on firm legal and administrative foundations. The assessment team considers the management framework for the fishery to be both adequate and effective.</i>	3 – 6	HIGH
MEDIUM	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. In other words, the aim is to ensure the sustainability of the fisheries while emphasising the economic benefits of the fisheries sector. The fisheries management system in Iceland is primarily based on extensive research on the fish stocks and the marine ecosystem, decisions made on the conduct of fisheries and allowable catches on the basis of scientific advice, and effective monitoring and enforcement of the fisheries and the total catch. These are the main pillars of the Icelandic fisheries management intended to ensure responsible fisheries and the sustainability of the ocean’s natural resources.		
HIGH	<p>The most recent version of the Fisheries Management Act was published in 2006 and includes:</p> <ul style="list-style-type: none"> • 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). 		

	<ul style="list-style-type: none"> • 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). <p>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. The results of this research are the foundations on which national fishery management decisions are made. Additional scientific advice, and advice on international stocks, is provided by ICES.</p> <p>International management of the Norwegian spring-spawning herring fishery is overseen by the North East Atlantic Fisheries Commission (NEAFC), to which all states participating in the fishery are signatories. Agreements in relation to the total TAC are enforced by management measure statements published by the NEAFC.</p>		
	a.ii. 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	References	Rating
LOW	<p><i>Determination: The management unit reflects the current scientific understanding of the biological stock. The stock assessment process includes consideration of all fishery landings; discard data are not available but discarding is considered minimal. ICES also take into account the biology of the species.</i></p>	2, 7, 8	HIGH
MEDIUM			
HIGH	<p>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. Spring-spawning herring have scale characteristics and a number of vertebrae indicative of the stock and as such despite the variable geographic distribution there is a consensus among scientists about the biological definition of the population. At the time of this assessment</p>		

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	<p>there is no recommendation from ICES that the stock assessment unit or management unit should be changed to better reflect the biological population.</p> <p>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, and ICES made an informed decision in 1994 to discontinue the practice of adding an estimated volume to total landings to account for this factor. The ICES working group responsible for conducting the stock assessment also considers the biology of the species, particularly the flexible and variable migratory patterns.</p>		
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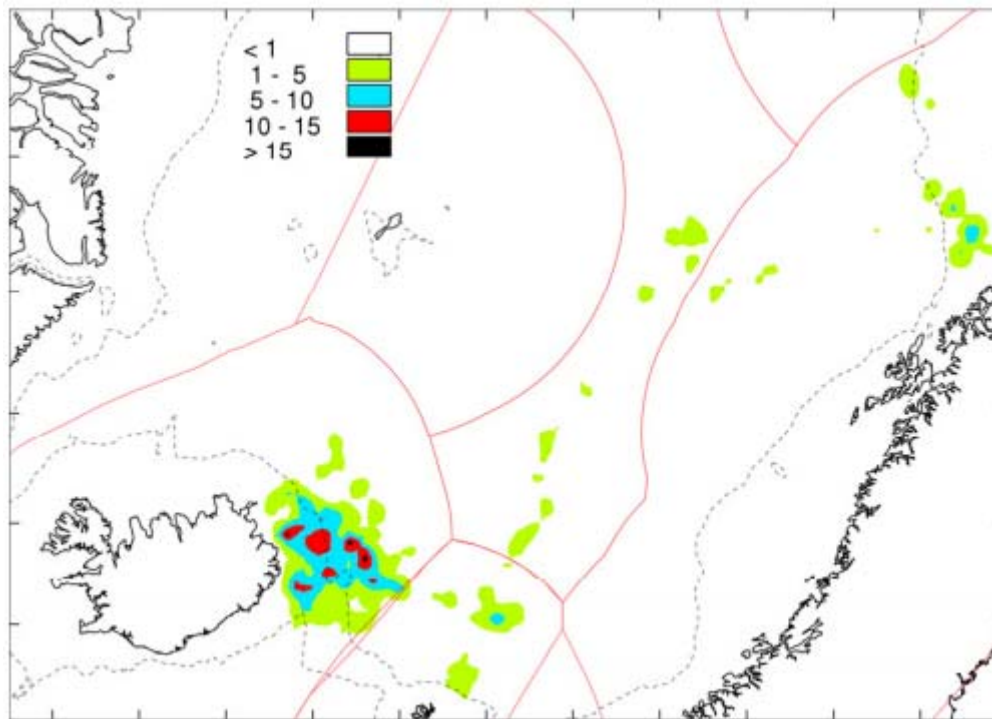
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Icelandic fleet fishing locations, 2011 season. Colours represent catch in tonnes/nm². Due to limitations in the extent to which Icelandic vessels are permitted to fish in the waters of other states, this is not necessarily an accurate representation of the distribution of the resource. From the MRI herring advice, 2012/13 (R8).

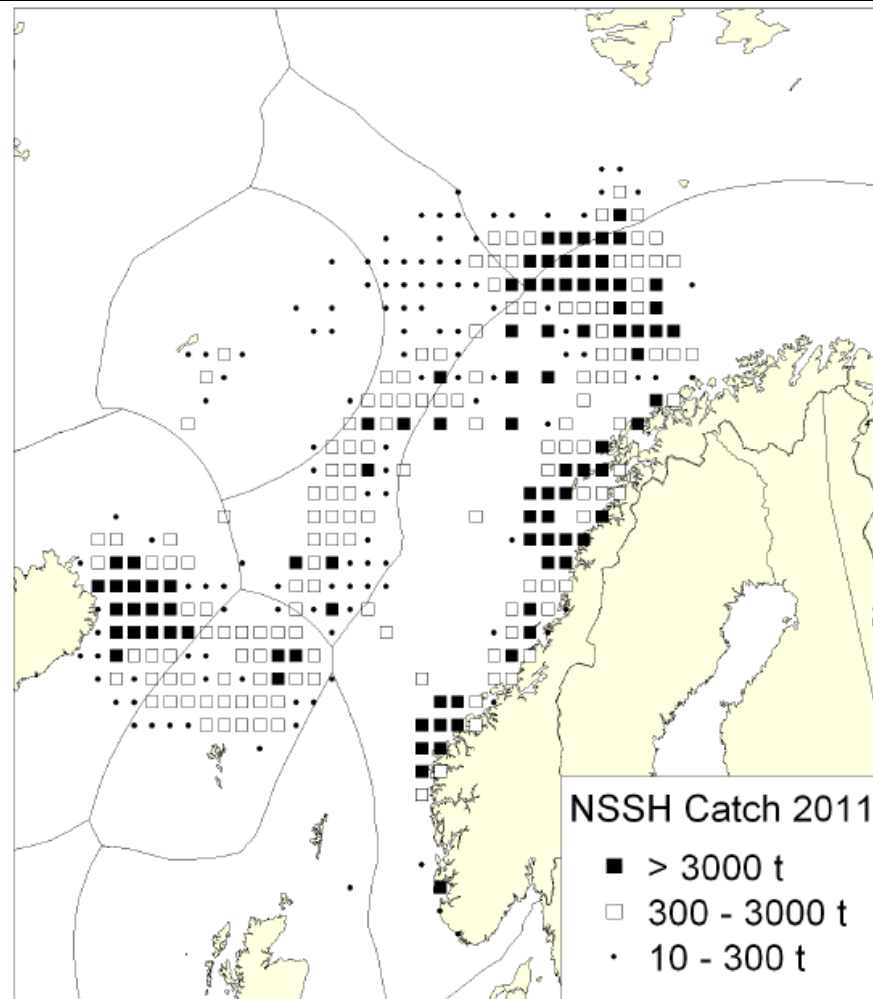
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Total reported catches of Norwegian spring-spawning herring in 2011 by ICES rectangle. From the WGWISE report, 2012 (R2).

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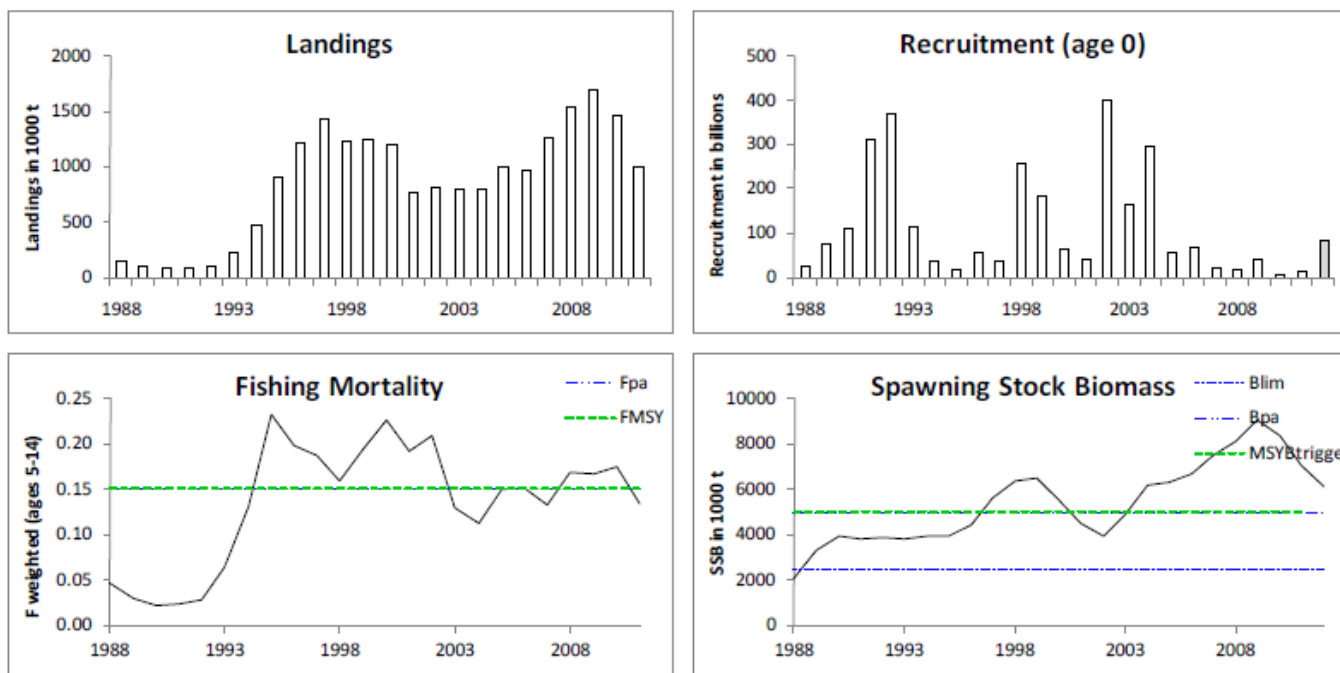
	a.iii .Management actions should be based on long-term conservation objectives	References	Rating
LOW	<p><i>Determination: The fishery is primarily managed according to a long-term international management plan first agreed in 1999. Although there have been years in which the signatory nations have not been able to agree to set the total quota in line with the plan, the most recent estimates of SSB and F are within the target reference points set as long-term objectives.</i></p> <p>Management of the Norwegian 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 as follows:</p> <ol style="list-style-type: none"> <i>Every effort shall be made to maintain a level of Spawning Stock Biomass (SSB) greater than the critical level (B_{lim}) of 2,500,000 t.</i> <i>For the year 2001 and subsequent years, the Parties agreed to restrict their fishing on the basis of a TAC consistent with a fishing mortality rate of less than 0.125 for appropriate age groups as defined by ICES, unless future scientific advice requires modification of this fishing mortality rate.</i> <i>Should the SSB fall below a reference point of 5,000,000 t (B_{pa}), the fishing mortality rate referred to under paragraph 2, shall be adapted in the light of scientific estimates of the conditions to ensure a safe and rapid recovery of the SSB to a level in excess of 5,000,000 t. The basis for such an adaptation should be at least a linear reduction in the fishing mortality rate from 0.125 at B_{pa} (5,000,000 t) to 0.05 at B_{lim} (2,500,000 t).</i> <i>The Parties shall, as appropriate, review and revise these management measures and strategies on the basis of any new advice provided by ICES.</i> <p>In general the total international TAC has matched that implied by the harvest control rules set out in this management plan. During 2003 – 2006 there was no international agreement on TAC, but since then the plan was adhered to by all signatories until 2013. There was again no international agreement on TAC for the 2013 fishery, an issue which is examined in more detail in section D1.</p>	2, 7, 9	HIGH
MEDIUM			
HIGH			

	The 2012 ICES advice stated that although SSB has declined in recent years, it was still above B_{pa} in 2012. ICES also reported that fishing mortality in 2011 was estimated to be below F_{MSY} and F_{pa} .	
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b. Stock Assessment Procedures and Management Advice

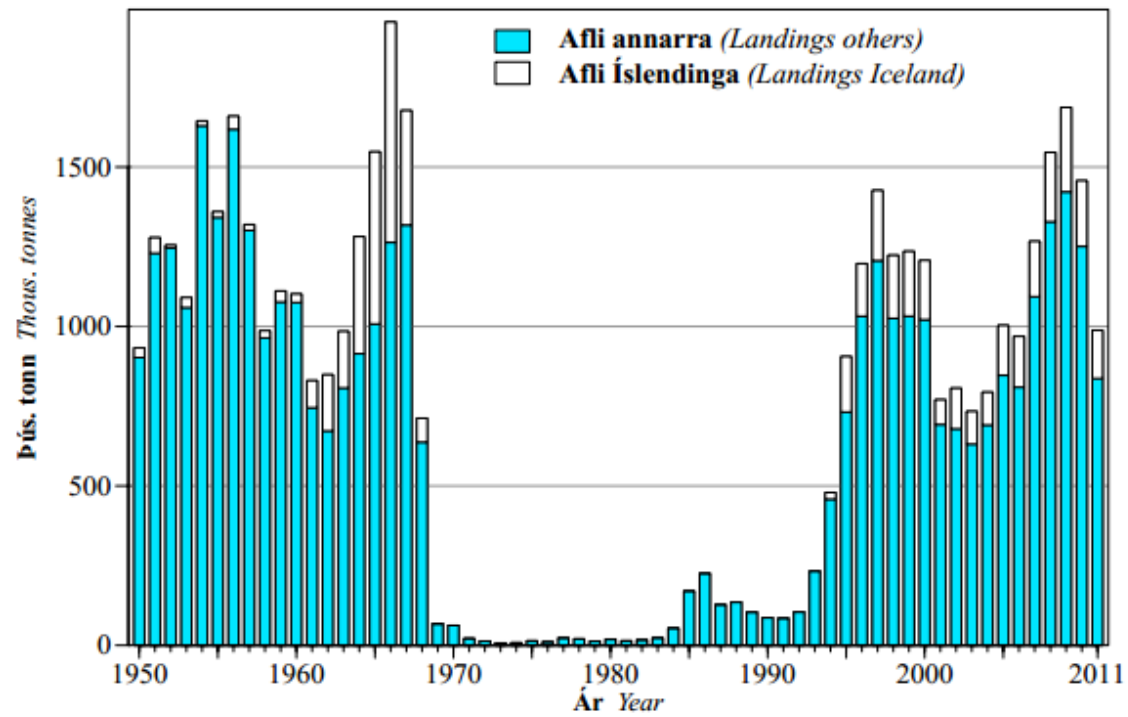
LEVEL OF COMPLIANCE	bi. Research in support of fisheries conservation and management should exist.	References	Rating
LOW	<p><i>Determination: ICES carries out an annual stock assessment based on a number of fishery dependent and fishery independent data sources. The current level of scientific understanding of the stock has room for improvement but is generally considered to be adequate to enable the sustainable management of the fishery.</i></p> <p>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 and -independent data sources to provide a range of management recommendations to the nations prosecuting the fishery using an age-based analytical model.</p> <p><i>Fishery independent data</i></p> <p>Eight survey indices are available to ICES, of which three have not been conducted in recent years (and are used only for tuning) and five continue to be updated. The five active surveys are the Norwegian herring larvae survey on the Norwegian shelf (NHLS), two indices from the joint Russian-Norwegian Autumnal ecosystem trawl survey focussing on recruitment estimates, and two indices covering the adult stock from the International Ecosystem Survey in the Nordic Seas (IESNS) and International Ecosystem Survey in the Barents Sea (Eco-NoRu-Q3 (Aco)). Together these provide estimates of the size and geographical distribution of the stock, the age structure, and recruitment rates.</p>	2, 7, 9	HIGH
MEDIUM			
HIGH			

	<p>The number of herring larvae was estimated by the 2012 NHLS survey to be 65.6×10^{12}, which was slightly lower than 2011, while the estimated production of larvae was slightly higher. The weighted mean size of the larvae was 11.60 mm which was higher compared to the 2011 estimate of 10.90 mm. The 2011 Eco-NoRu-Q3 (Aco) survey estimated the total number of juvenile herring to be 1.6 billion individuals. The IESNS, which ICES considers to be the most important survey in relation to the assessment of the stock, achieved adequate geographical coverage in 2012. The survey found that the stock was dominated by 6-8 year-old herring, with a total biomass of 4.6 million tonnes, significantly lower than the 2011 estimate of 7.4 million tonnes (although this figure has fluctuated significantly over the history of the survey).</p> <p><i>Fishery dependent data</i></p> <p>Every state participating in the fishery provides, as a minimum, data on total landings by quarter and ICES statistical area. Many fleets provide additional sample data including age, weight, length, mean weight-at-age, and mean length-at-age.</p> <p>ICES states that while discarding is low, slippage is known to occur and is not included in the assessment. ICES data indicate that the frequency of slipping and the total quantities of fish slipped are low and, although the quantity remains unknown, are too small to have a significant effect on the reliability of the assessment. There have also been updates to historical estimates of SSB and fishing mortality, with the 2012 assessment indicating that the stock biomass has been lower than assumed by previous assessments and that TACs, based on the target fishing mortality, have resulted in fishing mortalities higher than intended.</p> <p>While the 2012 ICES advice mentions these minor causes of uncertainty, it does not make any statements indicating significant problems in the data collection or stock assessment processes. The assessment team considers the level of research conducted on the stock to be more than adequate to enable sustainable management.</p>		
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Herring in the Northeast Atlantic, summary of stock assessment (the estimated shaded recruitment is the geometric mean 1988–2008).
From the ICES advice, 2012 (R9).

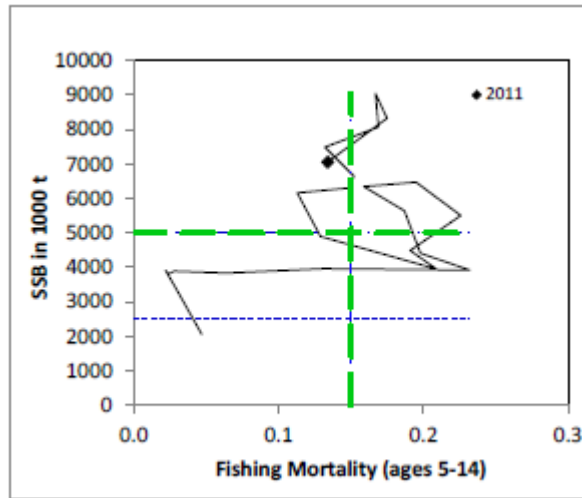
LEVEL OF COMPLIANCE	b.ii Best scientific evidence available should be taken into account when designing conservation and management measures	References	Rating
LOW	<p><i>Determination: Scientific advice is provided by both ICES and the MRI to inform the management of the fishery. Iceland has a number of technical measures in place general to pelagic fisheries, and although there are no specific management recommendations being made by ICES at this time Iceland has implemented similar recommendations in other fisheries in the past.</i></p> <p>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.</p>	2, 7, 8	HIGH
MEDIUM			
HIGH			



Total landings and Icelandic landings of Spring-spawning herring, 1950 – 2011. From the 2012/13 MRI advice (R8).

c. The Precautionary Approach

LEVEL OF COMPLIANCE	c.i The precautionary approach is applied in the formulation of management plans.	References	Rating																															
LOW	<p>Determination: The management plan which forms the basis of the management of the stock has been assessed by ICES and found to be in line with the precautionary approach. Fishing effort has been set with the aim of achieving a fishing effort below that implied by the precautionary approach.</p> <p>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 ($F = 0.15$).</p> <p>Herring in the North-East Atlantic – reference points. From the ICES advice, 2012 (R9).</p> <table border="1"> <thead> <tr> <th></th> <th>Type</th> <th>Value</th> <th>Technical basis</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Management plan</td> <td>SSB_{MP}</td> <td>5.0 million t</td> <td>Medium-term simulations conducted in 2001.</td> </tr> <tr> <td>F_{MP}</td> <td>0.125</td> <td>Medium-term simulations conducted in 2001.</td> </tr> <tr> <td rowspan="2">MSY Approach</td> <td>MSY $B_{trigger}$</td> <td>5.0 million t</td> <td>B_{pa}</td> </tr> <tr> <td>F_{MSY}</td> <td>0.15</td> <td>Stochastic equilibrium analysis using a Beverton–Holt stock–recruitment relationship with data from 1950 to 2009.</td> </tr> <tr> <td rowspan="4">Precautionary Approach</td> <td>B_{lim}</td> <td>2.5 million t</td> <td>MBAL (accepted in 1998).</td> </tr> <tr> <td>B_{pa}</td> <td>5.0 million t</td> <td>$B_{lim} * \exp(0.4*1.645)$.</td> </tr> <tr> <td>$F_{lim}$</td> <td>Not defined.</td> <td>-</td> </tr> <tr> <td>F_{pa}</td> <td>0.15</td> <td>Based on medium-term simulations.</td> </tr> </tbody> </table> <p><i>(unchanged since: 2010)</i></p>		Type	Value	Technical basis	Management plan	SSB_{MP}	5.0 million t	Medium-term simulations conducted in 2001.	F_{MP}	0.125	Medium-term simulations conducted in 2001.	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.	Precautionary Approach	B_{lim}	2.5 million t	MBAL (accepted in 1998).	B_{pa}	5.0 million t	$B_{lim} * \exp(0.4*1.645)$.	F_{lim}	Not defined.	-	F_{pa}	0.15	Based on medium-term simulations.	2, 7, 9	HIGH
		Type	Value	Technical basis																														
Management plan		SSB_{MP}	5.0 million t	Medium-term simulations conducted in 2001.																														
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MEDIUM																																		
HIGH																																		



SSB/F for the time series used in the ICES stock assessment (1988 – 2011). From the 2012 ICES advice (R9).

d. Management Measures

LEVEL OF COMPLIANCE	d.i The level of fishing permitted should be set according to management advice given by research organisations.	References	Rating
LOW	<p><i>Determination: The total international quota for the stock has been set in line with the management plan, and therefore with ICES advice, from 2007 to 2012. A failure to reach international agreement on quota allocations between states led to a total TAC in 2013 which is above the level implied by the management plan, but below the highest scientific recommendation. For this reason, the assessment team believes that a rating of medium compliance is appropriate. However, should the total international TAC be set above the precautionary and MSY-based scientific recommendations in future years, even if only because of the actions of an individual nation, the fishery should be awarded low compliance under this clause.</i></p> <p>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 quotas, the Faroese government withdrew from negotiations and set a unilateral TAC approximately three times larger than the share implied by the historical distribution ratio (105,230t as opposed to 32,000t). As the other signatory states allocated quotas according to the historical ratio, this implies a total international quota for 2013 of 692,230t. This is above the ICES recommendation associated with following the management plan (619,000t), but below the ICES recommendation associated with following the precautionary approach or MSY-based management (both 734,000t).</p> <p>Total landings have been not exceeded the international TAC by more than 3% in any year since 2006, and in many years fell slightly short of the quota. However, due to fluctuating estimates of SSB, the most recent estimates of historical fishing mortality place it above F_{pa} and F_{MSY} in the majority of years since 2005 (see the bottom left graph in section B1).</p>	2, 7 – 11	MEDIUM
MEDIUM			
HIGH			

	<p>In the 2012 advice, ICES states,</p> <p><i>“In the absence of strong year classes after 2004, the stock has declined since 2009 and is expected to decline further in the near future even when fishing according to the management plan. New year classes mature between ages 4 and 6. This means that it will take at least four years after they are born until they can contribute to an increase in the SSB. Surveys carried out in recent years in the Norwegian and Barents seas show no signs of new strong year classes after 2004.</i></p> <p><i>The short-term prognoses indicate a decline in SSB from 6.1 million tonnes in 2012 to 5.1 and 4.3 million tonnes in 2013 and 2014, respectively, assuming exploitation in 2012 and 2013 is according to the management plan. SSB in 2014 is expected to be below B_{pa} and $B_{trigger}$. In that situation, from 2013 onwards, article 3 of the Management Plan would need to be applied, to set TACs for 2014 and future years. This implies a lower F until the SSB has increased to $B_{trigger}$. Given the low recruitment in recent years, it is expected that SSB will decline further even if catches are low.”</i></p> <p>Future assessments of this stock should be particularly aware of this anticipated fall in SSB, and ensure that the total level of fishing pressure applied to the stock is reduced in line with future ICES advice.</p>		
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Basis: $F_w(2012)^1 = 0.141$; SSB (2013) = 5 080 thousand tonnes; Recruitment (2012–2014) = 82 billions (GM recruitment 1988–2008); Landings (2012) = 833 thousand tonnes (= TAC 2012).						
Rationale	Landings (2013)	Basis	F(2013)	SSB(2014)	% SSB change ²⁾	% TAC change ³⁾
Agreed management plan	619	F management plan	0.125	4 300	-15	-26
MSY	734	F_{MSY}	0.150	4 198	-17	-12
Precautionary Approach	734	F_{pa}	0.150	4 198	-17	-12
Zero catch	0	$F=0$	0.000	4 850	-5	-100
Other options	661	F_{2011}	0.134	4 263	-16	-21
	162	$F_{management} * 0.25$	0.031	4 706	-7	-81
	322	$F_{management} * 0.5$	0.063	4 564	-10	-61
	619	$F_{management} * 1.0$	0.125	4 300	-15	-26
	681	$F_{management} * 1.1$	0.138	4 244	-16	-18
	758	$F_{management} * 1.25$	0.156	4 176	-18	-9

Landings and stock biomass weights in thousand tonnes.
¹⁾ F_w = Fishing mortality weighted by population numbers (age groups 5–14).
²⁾ SSB 2014 relative to SSB 2013.
³⁾ Catch/landings 2013 relative to TAC 2012.

ICES quota recommendations and associated data for the 2013 Atlanto-Scandian herring fishery. From the 2012 ICES advice (R9).

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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	None ¹	906
1996	Keep SSB above 2.5 million t	-	None ²	1220 ⁴
1997	Keep SSB above 2.5 million t	-	1500	1427 ⁴
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 ⁴
2002	Do not exceed the harvest control rule	853	850	808 ⁴
2003	Do not exceed the harvest control rule	710	711 ³	790 ⁴
2004	Do not exceed the harvest control rule	825	825 ³	794
2005	Do not exceed the harvest control rule	890	1000 ³	1003
2006	Do not exceed the harvest control rule	732	967 ³	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	
2013	Follow the management plan	619		

Weights in thousand tonnes.
¹Autonomous TACs totaling 900 000 t.
²Autonomous TACs totaling 1 425 000 t were set by April 1996.
³There was no agreement on the TAC, the number is the sum of autonomous quotas from the individual Parties.
⁴Revised in 2010.

Herring in the Northeast Atlantic (Norwegian spring-spawning herring). ICES advice, management, and catches. From the ICES advice, 2012 (R9).

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LEVEL OF COMPLIANCE	d.ii Where excess fishing capacity exist, mechanisms should be in established to reduced capacity to allow for the recovery of the stock to sustainable levels.	References	Rating
LOW	<p><i>Determination: The management of excess fishing capacity is handled satisfactorily in Iceland. Annual quotas remain the primary mechanism for limiting fishing effort, although capacity-reducing processes are also in place.</i></p> <p>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. Within this system individual boat owners have substantial flexibility in exchanging quota, both among vessels within individual company as well as among different companies. The latter can be done via temporary or permanent transfer of quota. In addition, some flexibility is allowed by individual boats with regard to transfer allowable catch of one species to another. These measures, which can be acted on more or less instantaneously, are likely to result in lesser initiative to discards and misreporting than can be expected if individual boats are restricted by strict TAC measures alone. They may however result in fishing pressures of individual species to be different than intended under the single species TAC allocation. Decommissioning occurs indirectly, as companies increase their share of the TAC by buying out vessels and thus receiving the quota attached to those vessels.</p>	12	HIGH
MEDIUM			
HIGH			

LEVEL OF COMPLIANCE	d.iii Management measures should ensure that fishing gear and fishing practices do not have a significant impact on non-target species and the physical environment.	References	Rating
LOW	<p>Determination: <i>Although there is currently no evidence that the fishery definitely has a significant impact on non-target species or the environment, the limited quantity of information available on many potential impacts creates sufficient uncertainty for the assessment team to consider a medium compliance rating appropriate.</i></p>	2, 7, 9	MEDIUM
MEDIUM			
HIGH			
<p>Non-target species / bycatch</p> <p>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. In recent years increasing amounts of bycatch of mackerel have been reported in the traditional fishing grounds, pointing to a change in the distribution of mackerel.</p> <p>PET species</p> <p>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.</p> <p>Ecosystem considerations</p> <p>Juveniles and adults of this stock are an important component of the ecosystems in the Barents Sea, the Norwegian Sea, and the Norwegian coast. Herring has an important role as food resource to large fish, seabirds, and marine mammals, but also as a consumer of zooplankton in the Norwegian Sea and capelin larvae in the Barents Sea. A large SSB is expected to have positive effects on its predators, but the effects on other pelagic fish</p>			

	<p>stocks feeding in the Norwegian Sea such as blue whiting and mackerel may be negative due to competition for food.</p> <p>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.</p> <p>Physical environment</p> <p>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).</p>		
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e. Implementation

LEVEL OF COMPLIANCE	e.i There should be a framework for sanctions of violation of Laws and regulations.	References	Rating
LOW	<i>Determination: There is a robust framework for sanctioning violations of laws and regulations in place in Iceland.</i>	4, 13	HIGH
MEDIUM	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. If this is not done within a certain timeframe, the fishing permit may be revoked as well as a charge having to be paid for the illegal catch.		
HIGH	<p>Collecting and bringing ashore any catches in the fishing gear of fishing vessels is obligatory; discarding is prohibited and such conduct is subject to penalty according to law. If a vessel catches any species in excess of its fishing permit, the relevant fishing company has the option of obtaining additional quota within a certain period of time after landing the catch. Vessels are authorized to land a small percentage of the catch, usually by-catch, without the use of quota. The catch in question is sold at auction and the proceeds go to a research fund that supports marine research.</p> <p>Penalties are outlined in Articles 24-27 of the Fisheries Management Act, including:</p> <ul style="list-style-type: none"> • 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. <p>Fines may vary between ISK 400,000 (US\$3,200) and ISK 8,000,000 (US\$65,000), depending on the nature</p>		

	and scope, and whether it represents a repeat offence.		
LEVEL OF COMPLIANCE	e.ii A management system for fisheries control and enforcement should be established.	References	Rating
LOW	<p>Determination: Effective fisheries control and enforcement regimes are in place in Iceland.</p> <p>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.</p> <p>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.</p> <p>The Department of quota allocations of the Directorate issues commercial fishing permits, allocates catch quotas to Icelandic fishing vessels and maintains records of those rights. It also records quota transfers between vessels and checks that vessels do not fish in excess of their quotas. The department collects data on fishing and the catches landed by the Icelandic fleet and monitors compliance with rules on the weighing and recording of catches.</p> <p>Under a bilateral agreement between Iceland and the European Union (EU), Icelandic inspectors are required on board all EU fishing vessels in Icelandic waters</p>	4, 13	HIGH
MEDIUM			
HIGH			

References

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- 2 – ICES WG WIDE report 2012, Norwegian Spring-spawning herring:
[http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WG WIDE/Sec%2007%20Norwegian%20Spring%20Spawning%20Herring.pdf](http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WG%20WIDE/Sec%2007%20Norwegian%20Spring%20Spawning%20Herring.pdf)
- 3 – Icelandic fisheries management: <http://www.fisheries.is/management/fisheries-management/>
- 4 – Icelandic fisheries management act, 2006: <http://www.fisheries.is/management/fisheries-management/the-fisheries-management-act/>
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- 7 – ICS WG WIDE report 2012, Spring-spawning herring stock annex:
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<http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/her-noss.pdf>
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- 11 – Faroe Islands TAC figure & total international TAC:
<http://www.fisk.fo/Default.aspx?ID=2396&M=News&PID=6411&NewsID=5065>
- 12 – Fisheries capacity management with case studies:
<http://www.europarl.europa.eu/committees/en/studiesdownload.html?languageDocument=EN&file=43277>
- 13 – Icelandic fisheries enforcement: <http://www.fisheries.is/management/fisheries-management/enforcement/>
- 14 – Iceland Atlantic Herring fact page: <http://www.fisheries.is/main-species/pelagic-fishes/atlantic-herring/>

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