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# FISHERY ASSESSMENT REPORT

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## IFFO GLOBAL STANDARD FOR RESPONSIBLE SUPPLY OF FISHMEAL AND FISH OIL

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<b>FISHERY:</b>	<b>Summer Spawning Herring</b>
<b>LOCATION:</b>	<b>Iceland ICES ( Division Va)</b>
<b>DATE OF REPORT:</b>	<b>6<sup>th</sup> April 2010</b>
<b>ASSESSOR:</b>	<b>Mike Platt</b>

Global Trust Certification Ltd, Rivercourt Business Centre, Riverlane, Dundalk, Co. Louth, Ireland Tel: 042 932 0912 Fax 042 938 6864

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1. APPLICATION DETAILS AND SUMMARY OF THE ASSESSMENT OUTCOME			
<b>Name:</b> Icelandic Association of Fishmeal Manufacturers			
<b>Address:</b> [REDACTED]			
<b>Country:</b> Iceland		<b>Zip:</b> [REDACTED]	
<b>Tel. No.</b> [REDACTED]		<b>Fax. No.</b> [REDACTED]	
<b>Email address:</b> [REDACTED]		<b>Applicant Code</b>	
<b>Key Contact:</b> [REDACTED]		<b>Title:</b> [REDACTED]	
Certification Body Details			
<b>Name of Certification Body:</b>		Global Trust Certification Ltd.	
<b>Assessor Name</b>	<b>Peer Reviewer</b>	<b>Assessment Days</b>	<b>Initial/Surveillance/ Re-certification</b>
Mike Platt/Dave Garforth	Deirdre Hoare	6	INITIAL
<b>Assessment Period</b>	April to August 2010		
Scope Details			
<b>1. Scope of Assessment</b>		IFFO Global RS Standard Issue 1.0	
<b>2. Fishery</b>		Summer-spawning Herring	
<b>3. Fishery Location</b>		ICES division Va	
<b>4. Fishery Method</b>		Purse seine and pelagic midwater trawls	
<b>Outcome of Assessment</b>			
<b>5. Overall Fishery Compliance Rating</b>		<b>MEDIUM COMPLIANCE</b>	
<b>6. Sub Components of Low Compliance</b>		NONE	
<b>7. Information deficiency</b>		NONE	
<b>8. Peer Review Evaluation</b>		ACCEPT	
<b>9. Recommendation</b>		<b>CIRCULATE TO CERTIFICATION COMMITTEE</b>	

<b>2. QUALITY OF INFORMATION</b>
The Quality of information available to undertake the desk top study assessment was considered appropriate. A good level of material came directly from the responsible organisations for research, assessment, and management of the Icelandic Summer Spawning Herring Fishery.
<b>3. COMPLIANCE LEVEL ACHEIVED</b>
A <b>MEDIUM</b> level of compliance has been awarded. Refer to table detailing a summary of the level of compliance.
<b>Recommendation</b>
<b>Circulate report to Certification Committee</b>
<b>4. GUIDANCE FOR ONSITE ASSESSMENT</b>
<b>Based on HIGH compliance findings</b>
<ul style="list-style-type: none"> <li>• The auditor should check that there are no IUU activities and that the enforcement and control systems are in place</li> <li>• The on-site assessment should confirm that there is a procedure and records that demonstrate that each supplying vessel is legally entitled to fish in the fishery.</li> <li>• The auditor should inspect a fisher log book and note any comments on interactions with ETP species etc.</li> <li>• The auditor should review permits etc. to ensure they are valid</li> <li>• The auditor should review a catch to ensure that no more than 20% by volume has fish less than 13cm long, if it does has the captain been informed that this fishery is now closed.</li> <li>•</li> </ul>
<b>Based on MEDIUM compliance findings</b>
Establish if a TAC for 2010/2011 has been confirmed
<b>Based on LOW compliance findings</b>
<ul style="list-style-type: none"> <li>• <b>Not Applicable</b></li> </ul>
<b>5. ASSESSMENT DETERMINATION</b>
Overall a MEDIUM compliance rating has been assigned at this time. The summary details of compliance achieved are provided.
<b>HIGH Compliance</b>
In the view of the assessment team all sections of the fishery achieved a High compliance rating apart from A3 and D and D1
<b>MEDIUM Compliance</b>
The Icelandic Authorities do take into account the scientific advice but in 2008/9 did set a TAC higher than that recommended by the scientists and the assessment team have therefore decided to rate the compliance of the fishery to the long term conservation of the stock and the compliance of the industry to the scientific advice as only being medium compliance. However the on site assessment did confirm that no TAC for this stock has been decided for 2010/2011 until the affect of the disease in the stock has been established.

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<b>LOW Compliance</b>
<ul style="list-style-type: none"><li>• <b>Not applicable</b></li></ul>

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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 efficient exists					E1
A management system for fisheries control and enforcement should be established					E2
<b>KEY:</b>	Low Compliance: <span style="background-color: red; color: black;">          </span>	Medium Compliance: <span style="background-color: yellow; color: black;">          </span>	High Compliance: <span style="background-color: green; color: black;">          </span>		

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**FISHERY SUMMARY**

This following report reviews solely the Summer-spawning Herring (*Clupea harengus*) Fishery in Iceland ICES (**Division Va**) and cannot be used to assess any other Herring Fishery in the North Atlantic, due to their quite distinct geographical locations of each fishery.

The herring is the most abundant fish in the North Atlantic. It is a pelagic zooplankton feeder, mostly feeding on the copepods *Calanus finmarchicus*. It commonly reaches between 30 and 40 cm in length; the largest herring measured in Icelandic waters was 46.5 cm. It is a multispawner as opposed to the capelin and generally spawns in shallow waters in spring or summer. It can reach up to 25 years of age.

The North Atlantic herring is split into many stocks, based on where and when they spawn. Historically, the largest of these stocks is the Norwegian spring spawning herring. This stock spawns along the coast of central Norway. The Icelandic summer spawning herring (ISUM) is different from the NSSH stock as this stock is a coastal stock and does not leave Icelandic waters. It also differs in another respect, as it spawns in July. Currently these two stocks have quite separate distribution patterns and do not mix in Icelandic grounds, although previously they shared similar feeding grounds in early summer, north or east of Iceland.

The third stock in Icelandic waters was the Icelandic spring spawning herring. The life cycle of this stock was quite similar as for the NSSH stock except that it did not migrate to Norwegian waters to spawn but spawned in Icelandic waters. This stock collapsed at the same time as the other stocks, and is still virtually extinct, despite a total moratorium on fishing for the past three decades.

The fishing season for the ISUM; starts in September and carries on through the winter until May. The best fishing take place between September and February with the catching methods of either pelagic trawl or purse seine

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**6. RATIONALE OF THE ASSESSMENT OUTCOME**

**A. THE MANAGEMENT FRAMEWORK AND PROCEDURE**

LEVEL OF COMPLIANCE	
<i>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.</i>	
<b>LOW</b>	An administrative framework that ensures an efficient management of the fishery for its conservation is not established.
<b>MEDIUM</b>	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.
<b>HIGH</b>	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** **H**

**The Summer Spawning Herring has an effective and established management framework. The assessment team has agreed to give a high compliance rating to this section of the standard.**

Iceland has developed a Marine Policy, there are 6 key Ministries with responsibilities for the Marine; Fisheries, Environment, Foreign Affairs, Industry and Justice. Principally the Ministry of Fisheries and Agriculture is responsible for the management fisheries and is responsible for development and implementation of legislation and annual decisions on TACs. The Ministry is supported by the Directorate of Fisheries, the Marine Research Institute (MRI) and the Icelandic Fisheries Laboratory (IFL).

The Marine Policy acknowledges and has been developed to be in accordance with key International Agreements such as; UN Convention of the Law of the Sea and the Code of Conduct for Responsible Fisheries to deter and eliminate Illegal, Unregulated and Unreported Fishing.

In addition, this Marine Policy also includes The UN Fish Stocks Agreement, The Ecosystems Approach and the Precautionary Approach to fisheries management.

The 2006 Icelandic Act has given the Marine Policy a legal basis and this supersedes any other marine fisheries act.

LEVEL OF COMPLIANCE	
<i>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.</i>	
<b>LOW</b>	Fisheries management is not concerned with the whole stock unit over its entire area of distribution and does not take into account any of the matters listed in 'A1'.
<b>MEDIUM</b>	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.
<b>HIGH</b>	Fisheries management should be concerned with the whole stock unit over its entire area of distribution and take into account: <ul style="list-style-type: none"> <li>• All fishery removals</li> <li>• The biology of the species</li> </ul>

**Determination**

**Due to the nature of this summer spawning stock its entire distribution range is under the jurisdiction of the Icelandic regulatory authorities.**

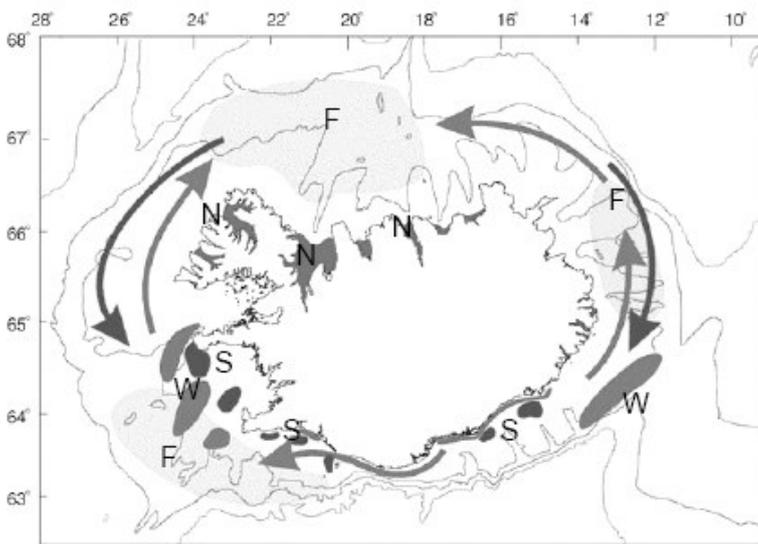


Figure 11.1.1. Chart indicating the major life-history aspects of Icelandic summer-spawning herring, including the feeding- (F), wintering- (W), spawning- (S), and nursery (N) grounds, and the main migration routes off coastal Iceland (Adopted from Jakobsson and Stefansson 1999).

Historically the main fishing grounds for the Icelandic summer spawning herring (ISUM) have been east and south of Iceland, but in the past few years most of the stock has been found off the west coast. Herring juveniles are most common in shallow waters off the north coast and adults frequently feed there during warm periods.

The ISUM stock stays very close to the Icelandic main land and do not migrate like other north Atlantic herring stocks. The stock stays in the Icelandic EEZ and as a result the entire population is managed by the Icelandic Ministry of Fisheries.

In addition, the MRI conduct extensive acoustic surveys each year which are to verify the stock biomass and these results are collaborated with ICES to set an agreed TAC for the forthcoming season.

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.

<p><b>Determination</b></p> <p><b>In the view of the assessment team the long term management plans do cover the conservation of this stock , but in 2008/9 the set TAC was 14.5% higher than that advised by the scientists and this is in contradiction to the advice given and has reduced the compliance rating to medium.</b></p> <p>The ISUM stock did collapsed in 1967, but was faster to recover than the NSSH stock. The size of the Icelandic stock has hit record high levels, and it now sustains catches of around 100 thousand tonnes or more annually.</p> <p>However, uncertainties in the models used to identify the size of the stock may have over estimated its size, which has resulted in a TAC being agreed that has led to a higher fishing mortality F than the intended precautionary level set by ICES. The intended fishing mortality level was initially set as precautionary measure and according to ICES would not have a detrimental effect on the stock biomass of the ISUM Herring. (ICES 2009).</p> <p>ICES used the precautionary <math>F_{pa} = F_{0.22}</math> for the Icelandic summer spawning herring (ICES, 1998) stock since 1998 at this fishing mortality level it was proven to be a successful management strategy for many years (MRI, 2008). In fact, this is the main management plan in action apart, from area closures to protect immature fish and prevent by-catches.</p> <p>Later studies have re-evaluated the interpretations of these acoustic estimates of the fishable stock abundance and have indicated that the stock may have inadvertently been fished at about <math>F = 0.3</math>, corresponding to a TAC of about 26% of the fishable stock (ICES, 2008). While an average <math>F = 0.3</math> does not seem to have negatively affected the stock, the main reason given is that the fishery has had good levels of recruitment. Both ICES and the MRI have however advised that for the long-term management of the stock the Fishing mortality at <math>F = 0.22</math> should still be the aim (ICES. 2008; MRI, 2008).</p> <p>Following this, MRI agreed that the TAC should be set at 131,000 t for 2008/2009, 12% above the advised TAC of 117,000 t for 2007/2008. If landings correspond to the TAC it is expected that SSB will drop 5% by 2009 to 586,000 t which is still well above the Bpa 300,000t. However the fishery managers decided in 2008/9 to set a TAC at 150,000 t <b>14.5% higher</b>.</p> <p>Current surveys now put the biomass closer to 334 000 t in 2009. Various stock assessment models are used and different estimates have been extrapolated from the data, but all have agreed that the biomass is still above the Bpa of 300,000t.</p> <p>In 2008, an infection of Ichthyophonus became widespread in the stock (estimated stock mortality at 32.2% ICES 2009). The status of the infection will be assessed with a survey in July 2009. The MRI will base its advice on the findings of this survey. ICES recommends no TAC until the findings of that survey and the spread of this infection have been evaluated. The Icelandic Ministry of Fisheries did set a provisional TAC for 2009/10 of 40,000 t but this was to be reassessed dependant on the survey findings and the state of the Ichthyophonus infestation. The onsite assessment did confirm that no decision on what the TAC will be for this stock has been agreed until the extent of this infestation has been established.</p>	<b>M</b>
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B. STOCK ASSESSMENT PROCEDURES AND MANAGEMENT ADVICE	
LEVEL OF COMPLIANCE	
<i>B1. Research in support of fisheries conservation and management should exist.</i>	
<b>LOW</b>	Research to support the conservation and management of the stock, non-target species and physical environment does not exist
<b>MEDIUM</b>	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.
<b>HIGH</b>	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

<b>H</b>	<p><b><u>Determination</u></b></p> <p><b>The Summer Spawning Herring does have in existence recent scientific evidence on its stock biomass and year class recruitment. Like the majority of pelagic fisheries on reviewing all this scientific evidence there is still uncertainty as to the true level of the SSB and what TAC should be set to ensure the long term conservation of the stock (ICES2009). It has been agreed that a high compliance rating should be given to this section of the standard.</b></p> <p>The MRI conducts the surveys that assess the spawning biomass of the Icelandic Summer Spawning Herring (ISUM) stock. It is derived from samples of both research and commercial catches as well as annual trawl/acoustic surveys, which have been ongoing since 1974 (Jakobsson, 1980; ICES, 2008). These surveys have been conducted in October-December or January near the over-wintering grounds of ISUM.</p> <p>The survey area is usually large and discontinuous, varies spatially over the years, and requires considerable survey time, e.g. since it is focused on both the adult and incoming year classes. Each year, the surveyed area is determined on the basis of all available information on the distribution of the stock, including information from the fishery. From this it can be safe to assume that surveys may miss parts of the stock and time for sampling during surveys maybe inadequate. Hence, an important part of the assessment process is the collection of samples from the commercial catch and the use of this information to convert measured acoustic indices to numbers and weights at age (ICES, 2008).</p> <p>Three fishery models (NFT-Adapt, XSA and TSA) have been compared to estimate the stock and recruitment into the adult stock to try and get the most accurate picture as possible of the current state of the stock (ICES, 2008).</p> <p>According to data from the 2008 survey, recruitment into this fishery has in the last decade been <b>above</b> the long term average. However, this survey showed that the stock was infested with the protozoa disease Ichthyophonous, which has 100% mortality for infected fish, and estimated that the natural mortality of the stock would therefore be increased by as much as 32% (ICES 2009).</p> <p>ICES recommended no TAC for 2009/10 until the results from the 2009 surveys are analysed to see the effect of this disease on the stock biomass.</p>
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LEVEL OF COMPLIANCE	
<i>B2. Best scientific evidence available should be taken into account when designing conservation and management measures.</i>	
<b>LOW</b>	Scientific advice is not taken into account when designing conservation and management measures.
<b>MEDIUM</b>	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.
<b>HIGH</b>	Scientific advice is taken into account, when designing conservation and management measures, in a comprehensive manner.

**Determination**

The ISUM stock is assessed by MRI on an annual basis and they advise on the long term conservation of the stock, which is taken into account when the TAC is set for the forthcoming fishing season

The estimated stock biomass 345,000 t (ICES 2009) is above  $B_{pa}$  (300,000 t) and has been classified by ICES as having full reproductive capacity (Jakobsson and Stefansson, 1999; ICES, 2008; MRI, 2008). This is corroborated by the acoustic survey results and analytical assessments despite the fact that some uncertainties in the fishery models used may exist. The main reasons for this full reproductive capacity are probably down to improved environmental conditions and a more conservative management strategy. The reasons given for improved environmental conditions are that the ISUM herring have had little if any competition for food and space by their spring spawning (ISSH) counterpart during the first 2-3 years in their life and, likely, will not have in the near future. Along with a conservative fishing policy, this may well have contributed to the relatively quick recovery (good recruitment) of the ISUM and may even allow the stock to grow beyond its present abundance.

However, when a fishery began after the stock collapse in the 1960's it was agreed between the Icelandic Ministry of Fisheries and the Marine Research Institute, Reykjavik (MRI) that the ISUM stock be exploited conservatively at  $F_{0.1}$ , i.e.  $F = 0.22$ , although catch ratios have inadvertently been somewhat higher. Due to generally good recruitment under favourable environmental conditions and possibly also because of underestimation of adult fish abundance and no competition by the ISSH in the nursery areas, the ISUM herring stock does not seem to have suffered from this higher fishing mortality but both MRI and ICES agree that for the long term conservation the fishing mortality should be restricted to  $F_{0.1}$  (ICES, 2008).

**H**

**C. THE PRECAUTIONARY APPROACH**

LEVEL OF COMPLIANCE	
<i>C1. The precautionary approach is applied in the formulation of management plans.</i>	
<b>LOW</b>	The precautionary approach is not applied in the formulation of management plans.
<b>MEDIUM</b>	The precautionary approach is applied, however not all uncertainties are taken into account.
<b>HIGH</b>	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**

**It is the view of the assessment team from the evidence analysed, the precautionary principle approach to this Herring fishery is applied and has ensured that the stock has been kept above the  $B_{pa}$  300,000t since its collapse in the 1970s.**

Fisheries management in Iceland has a long history and the fisheries management system has been under development for decades with a focus on the fisheries being both economical and sustainable with respect to the natural resources' utilization and renewal.

In recent years, measures have been taken in strengthening an ecosystem approach to the fisheries management in Iceland. Increasing emphasis is placed on research and development of methods in this field, and on fisheries advice that takes into account various interrelated factors in the ecosystem, such as the interaction of the species, environmental change and multi-species impacts. The focus is furthermore on strengthening research on the effects of fishing gear on the ecosystem, particularly on the seabed and the living bottom communities.

**H**

**REFERENCE POINTS**

The following reference points were agreed in 1998 and have been left unchanged ever since.

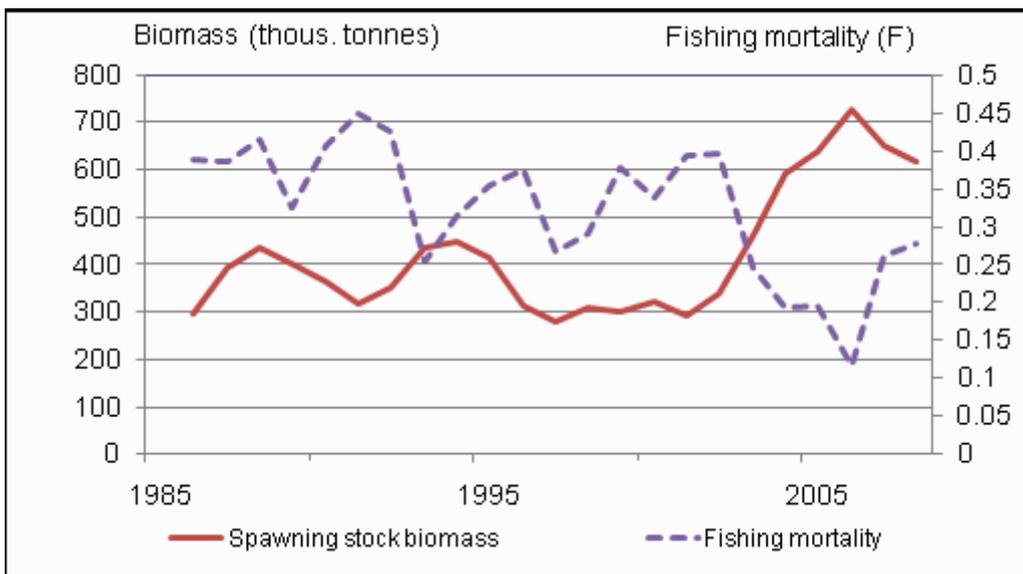
**Reference points**

	Type	Value	Technical basis
Precautionary approach	$B_{lim}$	200 000 t	SSB with a high probability of impaired recruitment.
	$B_{pa}$	300 000 t	$B_{pa} = B_{lim} e^{1.045\sigma}$ , where $\sigma = 0.25$ .
	$F_{lim}$	Not defined.	
	$F_{pa}$	0.22	$F_{pa} = F_{0.1} = 0.22$ (based on a weighted average).
Targets	$F_y$		

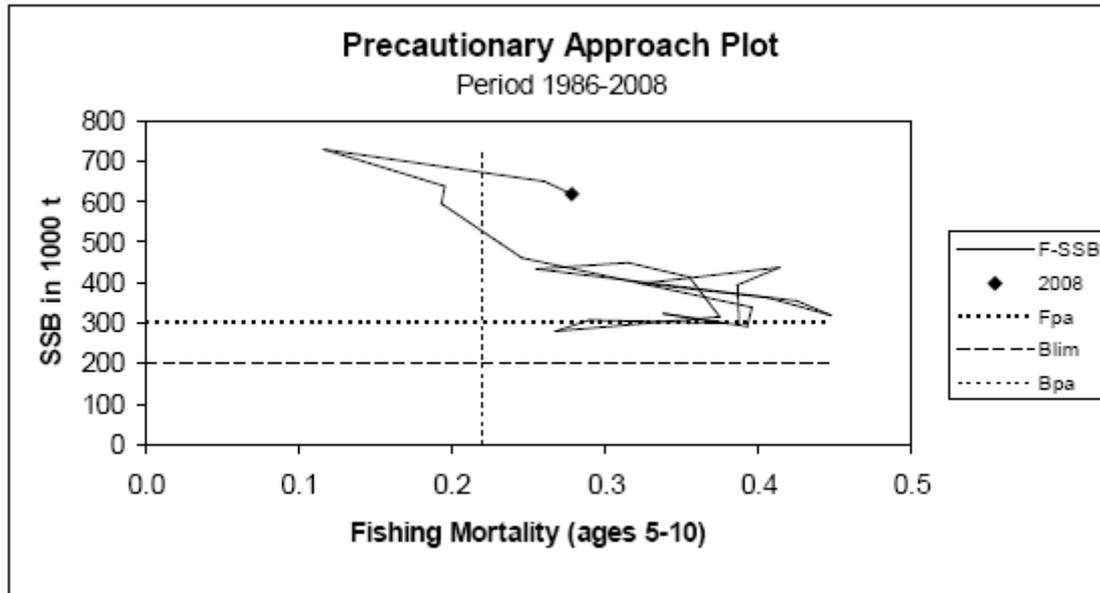
(unchanged since 1998)

The managing of the stock at an exploitation rate at or above  $F_{0.1}$  has been successful in the past despite uncertainty with the stock assessment. The Northern Pelagic and Blue Whiting working group in 1998 agreed to use the reference points stated above. The group met in 2003 to review the precautionary reference points and considered that the  $B_{lim}$  reference point at 200,000t should remain unchanged.

The fishing mortality has since 1990 been on average 0.304 approximately 40% higher than the intended target of  $F_{0.1} = 0.22$  ( see fig below) (ICES 2008)



This is despite the fact that the fishery managers have followed the scientific advice and restricted quotas with the aim of fishing at the intended target. During the this period the SSB has remained above the  $B_{lim}$  (see fig)



The precautionary reference points may however need to be re-evaluated, as latest reports state that the SSB is down to 334,000t (*MRI 2009 status of stock report*) from over 600,000t stated in 2008. This may be as result of overfishing, change in stock distribution and habitat and the affect of the Ichthyophonus disease.

**D. MANAGEMENT MEASURES**

**LEVEL OF COMPLIANCE**

*D1. The level of fishing permitted should be set according to management advice given by research organisations.*

<b>LOW</b>	The level of fishing permitted is not set according to management advice given by research organisations.
<b>MEDIUM</b>	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
<b>HIGH</b>	The level of fishing permitted is set according to management advice given by research organisations.

**Determination**

**This section has been rated as medium due to the fact that the managers consistently place a higher TAC on the stock than advised. In addition this TAC has been overshoot by the official landings. It would appear that from the scientific advice that the stock assessments to have an element of uncertainty and even with this slight over shoot the overall stock is still above the precautionary biomass limit of 300,000t for the long term conservation of the stock.**

The minister of fisheries determines the annual TAC of every species subject to quota regulation. A scientific assessment of the state of the fish stocks and the condition of the ecosystem constitutes the main basis of determining the TAC each year.

Conformity between the scientific fisheries advice and the authorities’ decisions on the TAC is a principal factor for ensuring responsible fisheries management. The authorities’ decisions on the maximum catch are based on social and economic factors, yet always focused on ensuring the long-term renewal of the fish stocks. The Icelandic authorities have implemented a utilization strategy with the long-term objective of ensuring sustainable fisheries (Icelandic Ministry of Fisheries and Agriculture).

**M**

## Scientific Advice

Year	ICES Advice	Predicted catch corresp. To advice	Agreed TAC	ICES Landings
1984		50	-	50.3
1985		50	-	49.4
1986		65	-	65.5
1987	F <sub>0.1</sub>	70	72.9	75.4
1988	F <sub>0.1</sub>	~100	90	92.8
1989	F <sub>0.1</sub>	95	90	97.3
1990/1991 <sup>2</sup>	<i>Status quo</i> F	90	100	101.6
1991/1992 <sup>2</sup>	F <sub>0.1</sub>	79	110	98.5
1992/1993 <sup>2</sup>	F <sub>0.1</sub>	86	110	106.7
1993/1994 <sup>2</sup>	No gain in yield by fishing higher than F <sub>0.1</sub>	110 <sup>1</sup>	110	101.5
1994/1995 <sup>2</sup>	No gain in yield by fishing higher than F <sub>0.1</sub>	83 <sup>1</sup>	130	132
1995/1996 <sup>2</sup>	No gain in yield by fishing higher than F <sub>0.1</sub>	120 <sup>1</sup>	110	125
1996/1997 <sup>2</sup>	No gain in yield by fishing higher than F <sub>0.1</sub>	97 <sup>1</sup>	110	95.9
1997/1998	No gain in yield by fishing higher than F <sub>0.1</sub>	90 <sup>1</sup>	100	64.7
1998/1999	No gain in yield by fishing higher than F <sub>0.1</sub>	90 <sup>1</sup>	90	87.0
1999/2000	Current F is sustainable	100 <sup>1</sup>	100	92.9
2000/2001	Current F is sustainable	110 <sup>1</sup>	110	100.3
2001/2002	Current F is sustainable	125 <sup>1</sup>	125	95.3
2002/2003	Current F is sustainable	113 <sup>1</sup>	105	97
2003/2004	Current F is sustainable	113 <sup>1</sup>	110	131
2004/2005	F=0.22	106	110	114.2
2005/2006	<i>Status quo</i> catch	110	110	103
2006/2007	<i>Status quo</i> catch	110	130	135
2007/2008	<i>Average of the last 3 year's catch</i>	117	150	159
2008/2009	F <sub>pa</sub> = 0.22	131	130	152
2009/2010	F <sub>pa</sub> =0.22	75		

Weights in '000 t.

<sup>1)</sup> Catch at F<sub>0.1</sub>.

<sup>2)</sup> Season starting in October of first year.

(ICES 2009)

Landings of summer-spawning herring (*Clupea harengus*) in Icelandic waters during the fishing season 2008/2009 amounted to 152 000 t. the TAC was set at 150,000t.

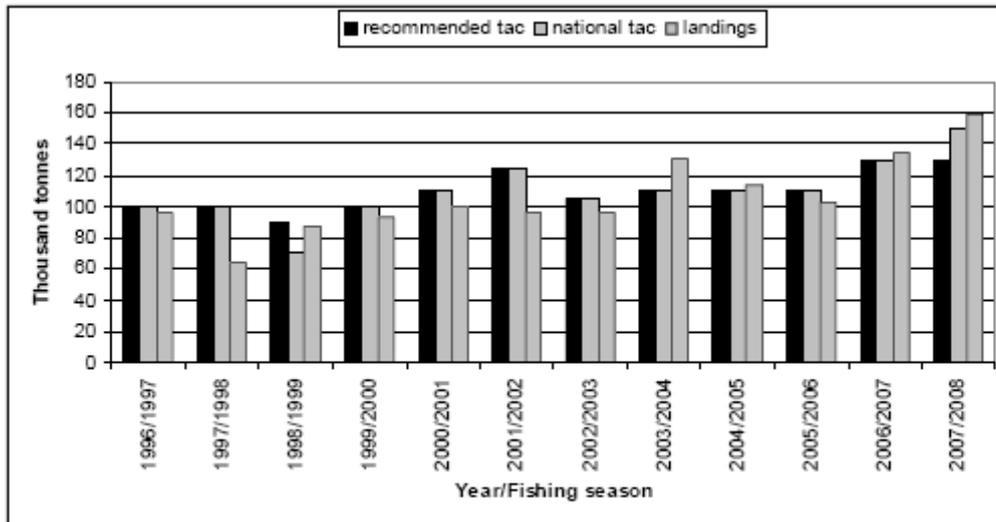


Figure 11.4.2.4. Comparison of landings, recommended- and agreed total allowable catch (TAC) of Icelandic summer-spawning herring during the fishing seasons 1996/97 to 2007/08.

However as the above figure shows the trend of actual landings of the ISUM has consistently exceeded the scientific advice and the managers set TAC on 4 of the past 5 years. For reasons already discussed the long term conservation of this stock at these higher fishing mortality rates as not appeared to deplete the stock and the scientific surveys still suggest that levels are still higher than the precautionary biomass figure of 300,000t.

**The quota system in Iceland**

The total allowable catch (TAC) is set by the Minister of Fisheries and based on the recommendation from the Marine Research Institute (MRI). All commercial fishing activities are subject to these quotas. Fishing vessels are allocated a fixed quota share of the species subject to TAC. The combined quota share for all vessels amounts to 100% of each species. The quotas were initially allocated on the basis of catch history prior to the institution of the quota system. The quota share is multiplied by the TAC to give the quantity which each vessel is concerned during the fishing year in question. This is referred to as the vessel’s catch quota. Permanent quota shares and annual catch quotas are divisible and transferable to other fishing vessels. The allocation of quotas is subject to a fishing fee. Individual enterprises may not control more than the equivalent of 12% of the value of the total quotas allocated for all species, and 12% to 35% for individual species (*Samherji HF website*)

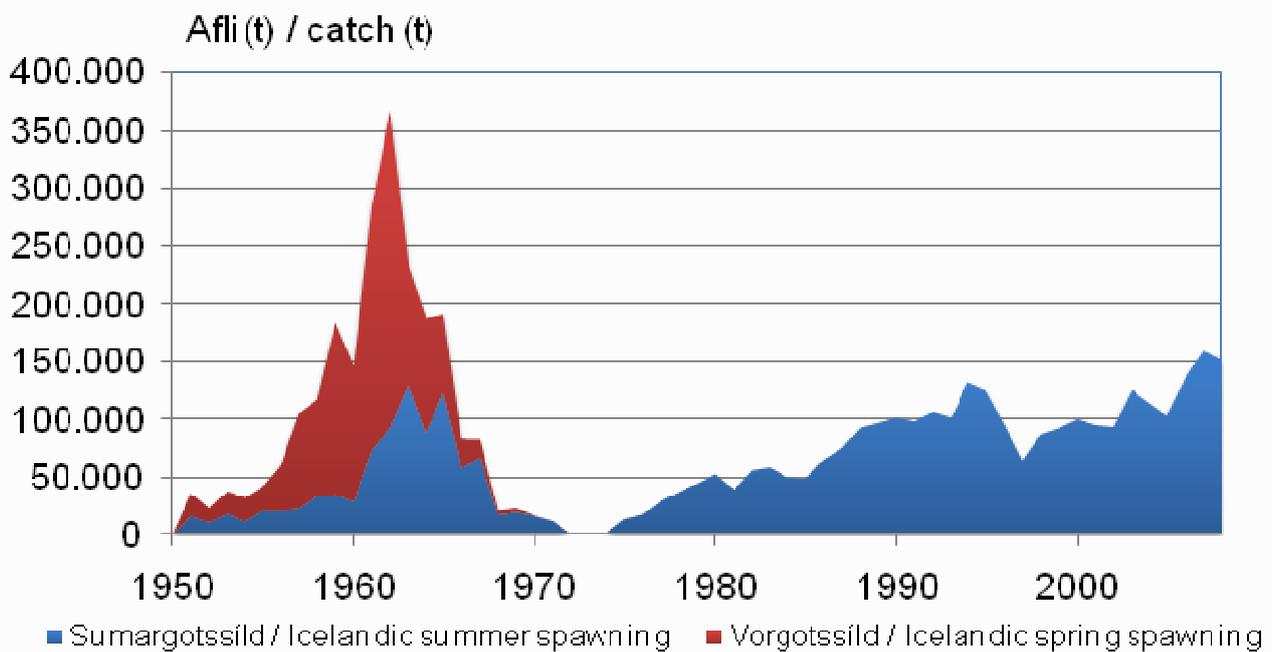
Currently there are 35 vessels that have been allocated the Herring quota when the TAC is set

LEVEL OF COMPLIANCE	
<i>D2. Where excess fishing capacity exists, mechanisms should be established to reduce capacity to allow for the recovery of the stock to sustainable levels.</i>	
<b>LOW</b>	Mechanisms to allow for recovery of the stock to sustainable levels are not established.
<b>MEDIUM</b>	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.
<b>HIGH</b>	Mechanisms are established to reduce capacity to allow for the recovery of the stock to sustainable levels and there are evidences of recovery.

**Determination**

In the view of the assessment team Iceland has established a number of mechanisms that will allow the sustained recover of the stock to ensure the longer term conservation of the ISUM herring and have rated the recovery plan as highly compliant to the standard.

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(Icelandic Ministry)

The above figure shows the rapid collapse in catch of the ISUM stock in the late 1960 and was totally banned in the mid 1970's to allow the stock to recover.

The fishery is managed by Iceland and according to ICES the recovery management plan has been based on the aim of keeping fishing mortality at  $F_{0.1}$  ( $= 0.22 = F_{pa}$ ) for more than 30 years. This was officially agreed in 1998 and has been used ever since to predict the catching mortality.

In addition the  $B_{pa}$  was set at 300,000t and the  $B_{lim}$  was set at a minimum level of 200,000 t. Evaluation of the effectiveness of this plan by ICES has not so far taken place (ICES 2008).

In parallel with the management plan, to protect juvenile herring (27cm or smaller) in the fishery, area closures are enforced as stated by a regulation about the herring fishery set by the Icelandic Ministry of Fisheries (no 376 Oct 1992). In 2006 season there were 6 closures, 4 were due to small herring and 2 related to a high proportion of non target species. (ICES2008)

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After the end of the season there is a complete fishing ban until the reopening of the fishery at the same time next year (e.g. MRI, 2008). The main reason is that the ISUM will spawn in JULY and the flesh will be spent and not fit for human consumption until at least 2-3 months after this spawning period.

**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.*

<b>LOW</b>	There are no management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment.
<b>MEDIUM</b>	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.
<b>HIGH</b>	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**

**It is the view of the assessment team and from the evidence provided from the onsite audit verification all the catches in Iceland are samples and all by-catches are landed and recorded. In addition, interviews with skippers did show that they are committed not to capture TEP species and if they do they will record such encounters for the Directorate. The assessment team has therefore rated the fishery as highly compliant.**

**Fishing Methods**

The large pelagic trawls used in a herring fishery are not operated on the bottom like otter trawls and are harmless for animals living on or close to the ocean bed.

The purse seine is more or less a stationary gear in that the net is set in a circle and then ‘pursed’ or closed with a wire, thus trapping the fish (school) inside. Damage to the substrate and organisms living therein or on top is not properly known but presumed to be minimal since the seines are pursed as soon as the lower end of the net reaches bottom for the express purpose that the seine does not dig into the substrate.

**Threatened Endangered and Protected Species (TEP)**

Apart from herring there are some 26 commercial species in Icelandic waters, not counting a number of marine mammals and sea birds. Like capelin, herring are in the lower range of the marine food-web but they are much larger and fast swimmers and as adults cannot be taken except by large cod and saithe. They may be taken to some extent by minke whales (*Balaenoptera acutorostrata*) and are the favourite food item in the diet of killer whales (*Orca orca*). The only seabird capable of catching herring to any extent seems to be the gannet (*Morus bassanus*) of which there is a very large colony on an islet off SW-Iceland. There are no native marine fish species or sea birds on the TEP-list in Icelandic waters (e.g. MRI, 1997).

Icelandic legislation (557/2007) all fishing vessels are to keep a Fishery Log-book. Birds and Mammals that are caught in fishing gear must be reported in the Fishery Log-book.

The Fishery Log-book is returned to the Directory of Fisheries once a month. The Directory of Fisheries then sends the reports to the Marine Research Institute where the information is used in their scientific work.

**Other Target and By-catch Species**

The fishery for the ISUM herring is predominantly a single species fishery and is not aimed at any other fish. After the end of the drift-net fishery in the 1980s, these herring are only fished with purse-seines and pelagic trawls.

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The fishery of the stock in the last four decades has been exclusively a single stock fishery until the fishing season 2004/2005, when Norwegian Spring Spawning Herring (NSSH) was found to be mixed with the ISUM catch off the east coast. The mixing of these two herring stocks is due the summer feeding migration of the NSSH has become increasingly more westerly in recent years and is approaching the ISUM summer distribution as it used to be before the stock collapse in the late 1960s. From the stage of maturity the NSSH is easily distinguishable from the ISUM and the contribution of Norwegian herring has been very low. Since most of the ISUM fishery took place off the west coast in 2007/2008, no NSSH were observed in the catch. Other by-catch in the seine fishery is practically non-existent.

In addition by-catches are also rare in the pelagic trawl fishery, i.e. since fishing with pelagic trawls is not permitted in areas which have been closed to other fisheries, e.g. due to undersized target species, unacceptable by-catch or other reasons.

The onsite audit confirmed that a close observation on what by-catch is being captured is recorded by the directorate.

**E. IMPLEMENTATION**

**LEVEL OF COMPLIANCE**

*E1. There should be a framework for sanctions of violation of Laws and regulations.*

<b>LOW</b>	A framework for sanctions of violation of Laws and regulations do not efficiently exist.
<b>MEDIUM</b>	A framework for sanctions of violation of Laws and regulations do exist but do not work efficiently.
<b>HIGH</b>	A framework for sanctions of violation of Laws and regulations exists and is proven to be efficient.

**Determination**

**Iceland has a proven framework for imposing sanctions if it detects violations to the fishing regulations and as such is highly compliant to the standard**

**Severe penalty for breaches of the fisheries management legislation**

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. *(Icelandic Ministry of Fisheries and Agriculture,).*

**Clear rules on discards and the disposition of by-catch**

Collecting and bringing ashore any catches in the fishing gear of fishing vessels is obligatory. Discarding catch overboard 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.

The Directorate of Fisheries and the Marine Research Institute conduct research and estimate discarded catches. The results indicate insignificant discards by the Icelandic fishing fleet *(Icelandic Ministry of Fisheries and Agriculture).*

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

**Determination**

**Iceland has a substantial management frame work to oversee the management and the controlling of fisheries under its jurisdiction and as such is highly compliant to the standard**

The Icelandic Directorate of Fisheries is responsible for monitoring and inspecting vessels while at sea, as well as landings. The Directorate also issues fishing permits and allocates catch quotas. Landing data is submitted to the Directorate on a daily basis, forming the basis of a near real-time overview of quota uptake.

All catches of Icelandic fishing vessels are weighted and recorded at the port of landing. 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 of landings in Iceland send electronic data daily to the Directorate. A total of approximately 50.000 landings are registered in the system every year.

No one may pursue commercial fishing in Icelandic waters without having a general fishing permit

**Permits**

All vessels are required to hold a commercial fishing permit regardless of what fish species they are targeting. A permit can only be obtained if the vessel is included in the Vessels Registry with the Directorate of Shipping and has been proven seaworthy

*(FAO, 2004.)*

All commercial fisheries are subject to authorization by the Directorate of Fisheries. The Iceland Coast Guard, which falls under the auspices of the Ministry of Justice, monitors the fisheries of vessels operating in Icelandic waters, as well as monitoring closed areas. Additionally, it inspects the fishing gear, for example the mesh size of the nets *(Icelandic Ministry of Fisheries and Agriculture,).*

There are also strict requirements for the keeping of logbooks on-board all fishing vessels and they must be made available for fishery inspectors. Furthermore, the logbooks are important for scientific assessment purposes (Responsible Fisheries, R8).

The Fisheries Association of Iceland represents the fishery sector’s interests domestically and internationally. The areas of discussion include environmental issues and responsible resource utilization. The Fisheries Association is a member of the International Coalition of Fisheries Associations (ICFA). The Association represents seven main organizations in the fisheries sector, including both employers and employees. The Fishery Association provides a mutual board for discussions for these organizations and enables local and international coalitions and multi-cooperative work (FAO, 2004; R5)

Regular sampling is conducted from landings and the individual’s length measured and weighed as well as determining their sex and gonad maturity. Moreover, otoliths or scales are sampled for age determinations. With available statistics on landings the total catch can be divided into age groups both by numbers and weight.

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In addition to regular sampling of landings and data on catch per unit of effort (e.g. kg of cod per each hour trawled) from mandatory skipper’s fishery log-books, a great amount of fishery independent information is obtained from research surveys. These include demersal fish and benthic invertebrate trawl surveys as well as pelagic fish acoustic surveys. The various data are utilized in stock abundance estimates using a number of different stock assessment models based on a one species or multi-species approach. An increasing attention is paid to research on behavior, availability and migration of fish by tagging as well as on species interactions, feeding and growth within the food chain. Finally, research is aimed at minimizing the catch of juveniles by improving fishing gear as well as by regular closure of spawning and juvenile areas *(Marine Research Institute )*

**Factors affecting the fisheries and the stock Regulations and their effects**

Discards are allowed when catches are beyond the carrying capacity of the vessel. Methods of transferring catches from the purse-seine of one vessel to another vessel were invented long ago, and since skippers of purse-seine vessels prefer to operate in groups, discards are practically zero.

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