



FOOD CERTIFICATION INTERNATIONAL LIMITED

Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY,
Scotland, UK

Tel: 00 44 (0) 1463 223 039 Fax: 00 44 (0) 1463 246 380

www.foodcertint.com

MSC Sustainable Fisheries Certification

Public Certification Report for the Scottish Pelagic Sustainability Group Ltd (SPSG) Atlanto-Scandian Herring Fishery



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prepared for: **Scottish Pelagic Sustainability Group Ltd**

by: **Food Certification International Ltd**



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**Authors: T. Southall, P. Medley, C. Carleton, M. Gill &
M. McFadden.**

Certification Body:

Food Certification International Ltd.
Findhorn House,
Dochfour Business Centre,
Dochgarroch,
Inverness,
Scotland,
IV3 8GY,
UK.

T: +44(0) 1463 223 039
E: melissa.mcfadden@foodcertint.com
W: www.foodcertint.com

Client Contact:

Scottish Pelagic Sustainability Group Ltd (SPSG),
1 Frithside St,
Fraserburgh
Aberdeenshire
AB43 9AR

T: +44 (0) 1346 510714
E: sfpa@btconnect.com
W: www.scottishpelagicsg.org

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Glossary of terms

ASCOBANS	(Bonn Convention's) Agreement on the Conservation of Small Cetaceans in the Atlanto-Scandian and Baltic.
ACOM	ICES Advisory Committee
ACFA	ICES Advisory Committee on Fisheries and Aquaculture
ASH	Atlanto-Scandian Herring
AT	The MSC assessment tree used for scoring a fishery
Bpa	Precautionary reference point for spawning stock biomass
Blim	Limit biomass reference point, below which recruitment is expected to be impaired.
CEFAS	Centre for Environment, Fisheries and Aquaculture Science (UK)
CFP	Common Fisheries Policy
CR	Council Regulation
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened and protected species
EU	European Union
F	Fishing Mortality
Flim	Limit reference point for fishing mortality that is expected to drive the stock to the biomass limit
Fpa	Precautionary reference point of fishing mortality expected to maintain the SSB at the precautionary reference point
FAM	MSC's Fisheries Assessment Methodology
FAO	United Nations Food and Agriculture Organisation
HCR	Harvest Control Rule
ICES	International Council for the Exploration of the Sea
IMR	Norwegian Institute of Marine Research
ITQ	Individual Transferable Quota
IWC	International Whaling Commission
MCS	Monitoring, Control and Surveillance
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NEAFC	The North East Atlantic Fisheries Commission
NEA	North East Atlantic
NGO	Non-Governmental Organisation
OSPAR	Oslo-Paris Convention (Convention for the Protection of the Marine Environment

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	of the North-East Atlantic)
P1	MSC Principle 1
P2	MSC Principle 2
P3	MSC Principle 3
PI	MSC Performance Indicator
PO	Producer Organisation
RAC	Regional Advisory Council
RSW	Refrigerated Sea Water
SFO	Scottish Fisherman's Organisation Ltd.
SONAR	Sound navigation and ranging
SPSG	Scottish Pelagic Sustainability Group
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
UK	United Kingdom
UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessel Monitoring System
VPA	Virtual Population Analysis
WGNPBW	ICES Working Group on Northern Pelagic and Blue Whiting Fisheries.
WWF	World Wide Fund For Nature
WGWIDE	ICES Working Group on Widely Distributed Stocks

Summary

- This report provides details of the MSC assessment process for the Scottish Pelagic Sustainability Group (SPSG) pelagic trawl fishery for Atlanto-Scandian herring. The assessment process began in February 2009 and concluded in March 2010.
- This assessment covers a fleet of 25 Scottish RSW pelagic trawlers. The vessels target herring using mid water pelagic trawls.
- The fishery is seasonal, with the majority of landings taken in late winter / early spring, although some vessels may choose to make use of their quota allocation later in the year. Fishing effort is largely focused in Norwegian waters, although this may vary depending on migration patterns..
- All vessels covered by the assessment have signed up to a “SPSG Sustainability Policy” in addition most vessels are members of the Seafish Responsible Fishing Scheme. In combination these serve as a code of conduct, including consideration of target species fishing practices, bycatch reduction measures, waste management procedures and recording of interactions with Endangered, threatened or protected species.
- A rigorous assessment of the wide ranging MSC Principles and Criteria was undertaken by the assessment team (details in section 6.1), which included review of available information, interview with key stakeholders, site visit and vessel visits. Details of the consultations are provided in the report and a detailed and fully referenced scoring rational is provided in the assessment tree in Appendix 3 of this report.
- On completion of the assessment and scoring process, the assessment team concluded that **the Scottish Pelagic Sustainability Group (SPSG) Atlanto-Scandian herring pelagic trawl fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.**
- There are a number of areas in which the fishery scored well:
 - The status of the stock, and more importantly the management rules that govern the stock and the assessment that supports the management were deemed to be satisfactory.
 - The available evidence suggests that the fishery is reasonably clean, with limited impact on the seabed habitat, a very low level of bycatch of other species and no routine discarding of unwanted species or small fish.
 - The management system, including the systems of fisheries representation, consultation and monitoring and enforcement are broadly consistent with MSC guidelines for sustainable management.
- None of the criteria which contribute to the overall assessment score, scored less than the unconditional pass mark, and therefore no binding conditions have been triggered.
- The assessment team did however make some recommendations. As these are not the result of a failure to meet the unconditional pass mark, they are non-binding; however in the opinion of the assessment team, they would make a positive contribution to on-going efforts to ensure the long term sustainability of the fishery. Details of these recommendations are provided in section 8.4 of this report and include
 - Additional observer coverage to independently verify a range of vessel operational characteristics.
 - Improved reporting protocols for ETP species and slippage
 - Simulation testing of the harvest control rules

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- The SPSG response to these recommendations is provided in the client action plan in Appendix 5 of the report.
- For interested readers, the report also provides background to the target species and fishery covered by the assessment, the wider impacts of the fishery and the management regime, supported by full details of the assessment team, a full list of references used and details of the stakeholder consultation process.

1. Introduction

This report details the background, justification and the result of Food Certification International's (FCI) assessment of the **Atlanto-Scandian Herring Fishery by member vessels of The Scottish Pelagic Sustainability Group Ltd. (SPSG)**, carried out by FCI to the standard of the Marine Stewardship Council (MSC) sustainable fishery programme.

1.1 Scope

This report provides an auditable account of the process that was undertaken by the team of FCI assessors and aims to provide clear justification for the assessment scores attributed to the fishery; identifying the sources of information that have been used to support these. This should enable subsequent surveillance or even re-certification teams to rapidly pin-point where the key challenges lie within the fishery and quickly highlight any changes which may affect the overall sustainability of the fishery.

In order to provide useful background and information for a wider readership it is also helpful to provide a more qualitative account of the fishery in question. However, it should be reiterated that no primary research has been undertaken to inform this report. The report is therefore not intended to comply with the standard editing norms expected for scientific journals. Instead it is intended that the report should be sufficiently clear and unambiguous to be reviewed by fisheries specialists, whilst remaining sufficiently accessible to provide insight for interested readers throughout the supply chain – including consumers. This is a challenging balance to strike without alienating either readership.

1.2 Report structure

Early report sections provide the reader with a clear comprehension of the nature of the fishery, enabling a broader understanding of the issues debated by the team when scoring the fishery. For the purposes of precision, this begins with a description of the unit of certification, before expanding to outline some further background information, including details of the SPSG fleet, fishing operations and gear and the species itself.

Subsequent sections are then broadly aligned to the 3 MSC principles¹, which form the basic structure of the assessment, namely:

- Principle 1: Target stock status and harvest controls (summarised in section 3)
- Principle 2: Wider impacts of fishery operations (summarised in section 4)
- Principle 3: The management System (summarised in section 5)

Later sections of the report explain the procedures used to score the fishery, give details of the assessment team, and present the outcome of the team's deliberations. Finally the report provides a statement of the team's recommendations as to whether or not this fishery should go forward for certification to the standard of the Marine Stewardship Council, together with any conditions recommended. The assessment tree used for scoring all the MSC criteria, the scores awarded and the detailed justification for each score is provided in Appendix 3.

1.3 Inspections & Consultations

This assessment process commenced in March 2009 with the site visit taking place in May 2009 when two members of the assessment team, supported by an FCI staff member visited key stakeholders from the North East of Scotland and Shetland in Fraserburgh. Some further consultations were subsequently undertaken to fill any remaining information gaps. By the conclusion of the consultation phase a programme of meetings (either face to face or via conference calls) had taken place with key

¹ Further information on the contents of the MSC principles and criteria are contained in Appendix 1.

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stakeholders. A complete list of those stakeholders interviewed during the assessment can be found in section 6.4 of this report.

The scoring of the fishery against the MSC principles and criteria took place shortly after the conclusion of the site visit and stakeholder consultation meetings, in Scotland at the end of May 2009.

2. The fishery

2.1 The unit of certification

Prior to providing a description of the fishery it is important to be clear about the precise extent of certification. The MSC Guidelines to Certifiers specify that the unit of certification is “***The fishery or fish stock (biologically distinct unit) combined with the fishing method / gear and practice (= vessel(s) pursuing the fish of that stock) and management framework***”.

This clear definition is useful for both clients and assessors to categorically state what is included, and what is not. This is also crucial to for any repeat assessment visits, or if any additional vessels are wishing to join the certificate at a later date. The unit of certification for the fishery under consideration is as set out below:

The unit of certification is the Scottish Pelagic Sustainability Group Atlanto-Scandian herring fishery. The fishery assessed for MSC certification is defined as:

Species:	Atlanto-Scandian ² Herring (<i>Clupea Harengus</i>)
Stock:	North East Atlantic Stock
Geographical area:	ICES Sub-area I, IIa & IIb, V & XIV. EU waters, international waters and the EEZ of Norway and Faroe.
Harvest method:	Single and Pair Pelagic Trawl, by Scottish RSW pelagic trawl vessels.
Management System:	Within the EU EEZ, management is undertaken by EU member states – National management is undertaken by Marine Scotland and monitored / controlled by Marine Scotland (Compliance), in association with the Norwegian Coastguard. Management is informed by ICES advice, supported nationally by the work of Marine Scotland (Science), and the work of the Norwegian Institute of Marine Research.
Local systems:	The SPSG have developed a sustainability code, which all vessels are in agreement with.

2.2 The Client

The client for this certification is the Scottish Pelagic Sustainability Group Ltd (SPSG), a grouping of Scottish pelagic fishing, processing and trading interests. Membership includes all Scottish pelagic vessels, the main pelagic Producer Organisations, and all the main pelagic processors and traders. It was established specifically to oversee the certification of pelagic fisheries (initially North Sea herring and Western Mackerel). The post of secretary of the SPSG is provided by the member organisation, the Scottish Pelagic Fishermen's Association (SPFA), and the secretariat function by Seafood Scotland, the main trade association for the Scottish seafood sector, which has significant pelagic representation on its board.

The Scottish Pelagic Sustainability Group (SPSG) was established in 2007. Further details about the SPSG are available at <http://www.scottishpelagicsg.org>. All vessels that are covered by this assessment are members of the SPSG and conform to its guidelines and policies (further details of these policies are provided in section 2.4).

² In other fisheries of the same species the term Norwegian Spring spawning herring is used – these are the same species.

2.3 Fishing Fleet & Fishing Method

The fleet included within the scope of this certification is the Scottish pelagic Refrigerated Seawater (RSW) pelagic trawl (single and pair) fleet. Over recent decades substantial concentration of the pelagic fleet has taken place, with far fewer, far larger vessels now remaining. A shift in technology towards storage of fish onboard in refrigerated seawater tanks has also occurred, initially supported by the use of very large purse seine nets. In the last fifteen years, however, further technological change (particularly in sonar, and three dimensional imaging of the relationship between vessel, net and fish shoal) has favoured the use of large mid-water trawls. The mid-water trawl is now the gear of choice in the Scottish fleet³.

Currently there are 25 vessels, fleet details are provided in Table 1. These vessels fish out of Fraserburgh, Lerwick and Peterhead. All vessels are members of Producer Organisations (Scottish Fishermen's Organisation, Shetland PO, Northern Ireland Fish Producers Organisation, Lunar, Klondyke).

Table 1 - Vessels in membership of the SPSG

Vessel	Reg. No.	Home Port	PO
Adenia	LK 193	Lerwick	Shetland PO
Altaire	LK 429	Lerwick	Shetland PO
Antarctic	LK 145	Lerwick	Shetland PO
Antares	LK 419	Lerwick	Shetland PO
Challenge	FR 226	Fraserburgh	Klondyke
Charisma	LK 362	Lerwick	Shetland PO
Chris Andra	FR 228	Fraserburgh	Klondyke
Christina S	FR 224	Fraserburgh	SFO
Enterprise	FR 365	Fraserburgh	NIFPO
Forever Grateful	FR 249	Fraserburgh	SFO
Kings Cross	FR 380	Fraserburgh	Lunar
Krossfjord	BF 70	Fraserburgh	SFO
Lunar Bow	PD 265	Peterhead	Lunar
Ocean Quest	BF 77	Fraserburgh	SFO
Ocean Venture	FR 77	Fraserburgh	SFO
Pathway	PD 165	Peterhead	Lunar
Prowess	CY 720	Fraserburgh	SFO
Quantus	PD 379	Peterhead	SFO
Research	LK 62	Lerwick	Shetland PO
Resolute	BF 50	Fraserburgh	SFO
Serene	LK 297	Lerwick	Shetland PO
Sunbeam	FR 487	Fraserburgh	SFO
Taits	FR 227	Fraserburgh	Klondyke
Unity	FR 165	Fraserburgh	SFO
Zephyr	LK 394	Lerwick	Shetland PO

Note: Not all vessels listed in this certification currently target the species under assessment. Some vessels do not have a track record in the fishery and do not therefore get an initial quota allocation; others may feel it more strategic or economic to trade initial Atlanto-Scandian allocations for other pelagic quota species.

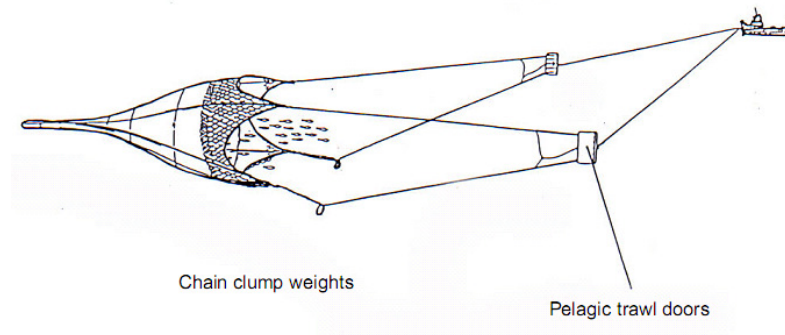
With the flexibility in the system to allow vessels to trade quota either within or between member POs, thus allowing any member vessel to target the fishery, it is sensible to include all vessels in the unit of certification. As the operational characteristics of all vessels are much the same, this does not materially affect scoring.

The vessels are modern and technologically advanced with on-going investment in state of the art technology and modern electronic equipment such as sonar, net and catch monitors, which have greatly improved the precision of this method of fishing. Pelagic trawls are towed at the appropriate level in the water column to intercept target shoals, with gear depth being controlled by altering towing speed and/or warp length. As a result, there is no impact on bottom habitats and bottom structures. The mid-water trawl used by the Scottish pelagic fleet is designed and rigged to fish in midwater, including in the surface water (Fig 1). The large net (considerably larger than a demersal trawl net) consists of a cone shaped body, ending in a codend with lateral wings extending forward from the opening. Large mesh in the wings herd the fish before tapering to finer meshes in the square, belly and eventually the cod end. Larger mesh near the start of the net is designed to facilitate the escape of small fish and also pelagic invertebrates such as jellyfish which have the potential to be heavily impacted by pelagic

³ Although some Scottish vessels retain the flexibility to use purse seine nets, this gear type has not been considered as part of this assessment and is not therefore included in the unit of certification.

fisheries. The horizontal opening is maintained by mid-water otter boards (or by pair trawling) whilst the vertical opening is maintained by chain on the groundline and floats on the headline – although these are not always required – depending on the way the net is rigged.

Fig 1 – Schematic showing operation of mid-water trawl & image of a typical SPSG RSW Pelagic trawler



Source: *Seafish basic fishing methods handbook*



2.4 Local Management Plan

As referred to in earlier sections, the Scottish Pelagic Sustainability Group was formed in 2007 for the specific purpose of commissioning and supporting the assessment of its fisheries to the MSC standard. The Scottish pelagic industry considers the following principles to be the underpinning basis of its sustainability policy (see www.scottishpelagicsg.org/):

- SPSG members will ensure that the pelagic fisheries in which they operate are fished and managed responsibly.
- Recognising that pelagic resources are shared at national and international levels, and SPSG members will cooperate with all industry stakeholders and regulatory authorities in their sustainable management.
- Vessels will make all reasonable efforts to minimise unintended bycatch and discards. The industry promotes participation in an equitable implementation of the Common Fisheries Policy (CFP) as a means to apply and build upon the framework of the FAO Code of Conduct for Responsible Fisheries.
- The industry takes full note of the ICES advice as the basis of best scientific advice which will contribute to management measures governing pelagic fisheries.
- The industry is committed to the maximization of product quality through the application of best practice.

- Quality is at the forefront of the Scottish processing sector, and the Scottish pelagic processing factories are based near to the main fishing grounds, deploy modern technology, and are equipped with the latest machinery for receiving, grading, filleting, packing, and freezing herring and mackerel. In addition, all pelagic processing factories are required to have the facility to record the actual (certified calibration) weight of fish landed to them.

2.5 Target species

As indicated initially, this report does not intend to provide a scientifically comprehensive description of the species. Interested readers should refer to sources that have been useful in compiling the following summary description of the species⁴. These include:

- ICES Working Group on Widely Distributed Species Report:
<http://www.ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=273>
- ICES Advice Book 9.4.5: <http://www.ices.dk/committe/acom/comwork/report/2008/2008/her-noss.pdf>
- National Research bodies:
http://www.fisheries.no/marine_stocks/fish_stocks/herring/marine_stocks_norwegian_spring_spawning_herring.htm
- FAO Fishbase:
<http://www.fishbase.org/Summary/speciesSummary.php?GenusName=Clupea&SpeciesName=harengus>
- FAO Fishery Resources Monitoring System <http://firms.fao.org/firms/resource/10335>
- Sustainable Fisheries Partnership, FishSource:
<http://www.fishsource.org/fishery/norwegian%20spring-spawning%20herring/identification>

The Atlanto-Scandian herring largest herring stock in the world and the largest stock of any commercial species in North Atlantic. It is a highly migratory northern herring stock, widely distributed throughout large parts of the North East Atlantic. It is recognised as being the largest herring stock in the World (ICES WGWIDE 2008).

Atlanto-Scandian herring is distinguishable from other herring stocks by its greater number of vertebrae, and larger overall size. It is also noted for the large variation in year class strength.

Geographic Range

Atlanto-Scandian herring undertakes extensive migrations in the NE Atlantic. The adult herring have a clockwise annual pattern although the exact migration pattern has changed over time.

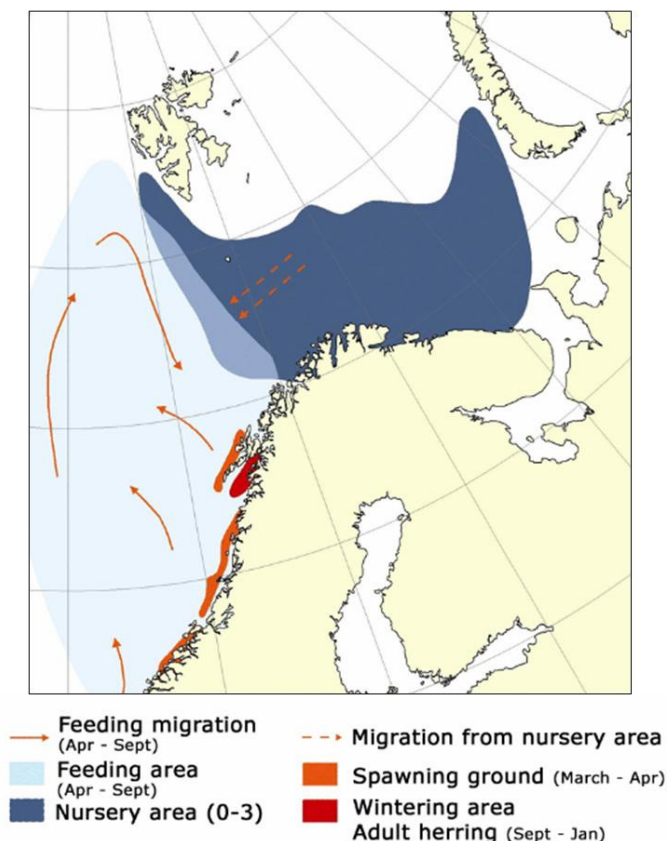
The herring spawns along the Norwegian west coast (mainly between 62° and 71°N) in February and March. The larvae drift north and northeast to the Norwegian coast and the Barents Sea, where the main areas for immature fish are found. The main driving force for this larval drift is the North Atlantic drift, the current which bathes the Norwegian coast in relatively warm water and transports the passive planktonic organisms northwards and into the Barents Sea. Most of the young herring leave the Barents Sea at three years of age and feed off northern Norway for two years, however since 2003, a more south western feeding pattern has been observed with increasing amounts of older herring feeding in the waters north of the Faroes and east of Iceland during May and June. As the feeding season progresses, the herring undertake a northerly migration through the Jan Mayen zone along the polar front zone. Atlanto-Scandian herring fully recruit to the spawning stock at 5 years of age.

After the feeding season, the herring contracts into the wintering areas in September to October. The location of these areas is unstable and since 1950 the stock has used at least 6 different wintering areas in different periods. During the 1950s and 1960s they were situated east of Iceland and since

⁴ It should be noted that Atlanto-Scandian herring is typically, though not universally referred to as Norwegian Spring Spawning herring in these reports.

around 1970 in Norwegian fjords. In 2001–2002 a new wintering area was established off the Norwegian coast between 69°30'N and 72°N and in 2007/2008 no herring was observed in the fjords in winter. After wintering, the spawning migration starts around mid January.

Fig 2: Main areas and migration patterns of Atlanto-Scandian herring



Source: Norwegian Ministry of Fisheries and Coastal Affairs

It has been demonstrated that climatic and environmental factors influence the migration pattern of Atlanto-Scandian herring (Sissener & Bjørnå 2004). Over the last 25 years the southern and western Norwegian Sea has become colder while the eastern Norwegian Sea has warmed. In recent years the waters north and northeast of Iceland have warmed, although cold Arctic water again flowed south and eastwards during the winter 2004/2005. Average zooplankton biomass in the Norwegian Sea has decreased since 2002 and is now at a comparatively low level in the central Norwegian Sea. This in turn influences the distribution of Atlanto-Scandian herring which also show a correlation between zooplankton biomass and stock condition and reproductive success.

Lifecycle

Herring are demersal spawners. Shoals of herring gather on the spawning grounds and spawn more or less simultaneously - releasing eggs in a single batch. Eggs are laid on the sea bed, on stones, gravel or sand beds. A female herring may deposit from 20,000 up to 120,000 eggs, depending on age and size. The eggs sink to the bottom, where a mucus coat enables them to form layers or clumps. Incubation time varies between 10 to 40 days depending on temperature.

The larvae are between 5 and 6mm at the time of hatching, and early nutrition is provided by a small yolk sac. Only the eyes are well pigmented and the rest of the body is semi-transparent - virtually invisible underwater. The newly hatched larvae drift with oceanic currents. By the age of one-year, herring have a typical length of 10cm, and first spawning can occur at 3 years old, but are fully recruited at 5 years old. Adult herring have been reported as old as 20 years, but this is very uncommon.

Diet

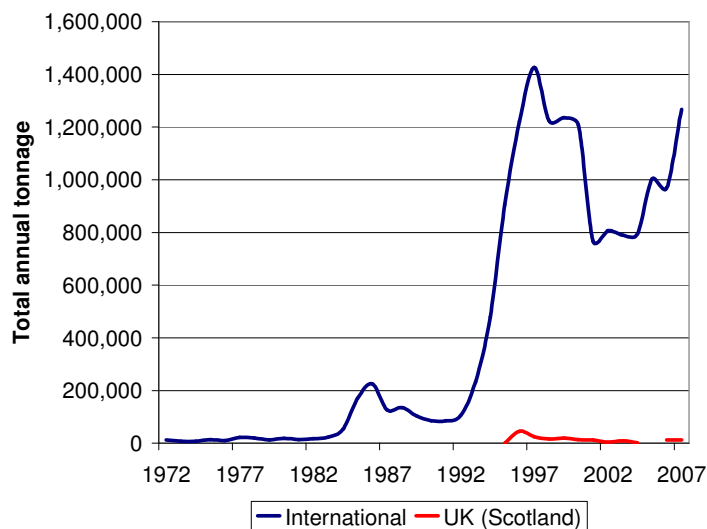
Clupea harengus play a major role in the food chain, consuming enormous quantities of zooplankton (copepods, larval snails, diatoms, mysids, euphausiids etc.) and juvenile sandeels. There are no marked differences between the diets of small and large herring; only the proportions of the different food items change with size. Young herring typically capture prey individually, but where prey concentrations reach very high levels, such as micro-layers that occur at fronts, herring are able to swim forwards with open mouth and expanded opercula.

Herring are a lower trophic level species that also play an important role in the food web throughout all their life history stages, serving as an important prey item for other higher trophic level species of fish and marine mammals.

2.6 Catches and landings

The Atlanto-Scandian herring fishery has a long history. Traditionally the fishery was targeted mainly by Norway, Russia (USSR) and Iceland. Near the turn of the 20th century catches were typically around 13,000t but this rose steadily as a result of good stock levels and the advent of mechanised fishing and the development of the fishing industry, including reduction of herring to fishmeal and oil. In particular, the development of the power block for purse seining allowed much larger vessels, working away from the coast to purse seine catches without the need to use small 'dorys' to deploy the net. By the mid 1950s catches had risen to over 1.5 million tonnes per annum. Overfishing combined with poor recruitment lead to a substantial reduction in stock size and rapidly falling catches, to the point in the 1970s where catches had fallen to just 50,000t, representing just 3% of the catch levels which had been enjoyed just a decade or so before.

Fig 3: Trend in overall landings of Atlanto-Scandian Herring since 1972.



Source: Data derived from ICES WGWIDE (2008)

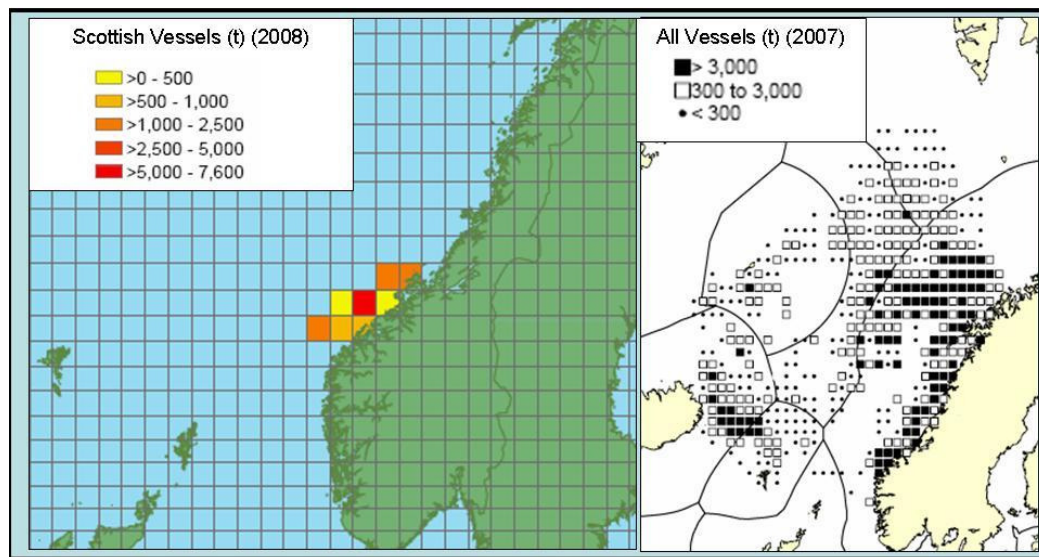
As a result of this stock collapse access to the fishery was tightly restricted for much of 1970s and the early 1980s. Patterns of recruitment improved in the early 1980s and was followed by a steady expansion of landings in the late 1980s. By the mid-1990s the Atlanto-Scandian herring fishery offered new catching opportunities at a time when other traditional pelagic fisheries were facing cut backs (such as the total collapse of the North Sea mackerel fishery during the late 1970's and the subsequent demise of that element of the NEA stock), and more boats (and national fleets) began showing an interest in the fishery – seeking to build track record and demonstrate legitimate claim to access of the highly migratory and therefore, internationally shared stock.

The EU negotiated access to the fishery in the late 1990s. The first Scottish vessels began to target the stock (on little more than a trial basis) in 1995. Initially Scottish vessels targeted the stock in

international waters, but due to the species migration pattern this meant that fish were caught on return from summer feeding grounds. As a result of large amounts of food in the stomach, the fish were suitable only for fishmeal – obtaining a lower price. By 1997 Scottish vessels were licensed to use their quota allocation in Norwegian waters. This enabled the fishery to shift earlier in the year, when fish are moving from wintering to spawning grounds, and do not have the same level of food in the stomach. This access to Norwegian waters therefore enabled Scottish vessels to harvest at the optimum moment, for premium quality fish for human consumption.

This pattern remains today, with Scottish vessels seeking to maximise the value of a relatively small quota allocation by fishing a very short season in late January and February, almost exclusively in Norwegian waters. A very small number of Scottish vessels may fish their quota allocation later in the year, if they deem it strategic or economic to do so, but this is also likely to be in Norwegian waters. By contrast, many of the other fleets targeting the resource are likely to fish over a wider range and throughout the year, following the stock's migration pattern.

Fig 4: Comparative distribution of fishing effort for the Scottish fleet (LH image for 2008) and all fishing effort (RH image 2007).



Source: LH image: Marine Scotland. RH image: ICES WGWIDE 2008

*The main focus of this assessment is therefore broadly based upon the **current fishery location and seasonality** (i.e. a mainly early spring fishery in Norwegian waters). Should this pattern change significantly - in particular leading to substantial shift in activity to either international waters or the EEZ of Faroes or Iceland (which would require some re-negotiation of existing bilateral agreements) – **then the SPSG shall, at the earliest opportunity, inform FCI, who will consider the implications of any such change, in the context of overall fishery assessment.***

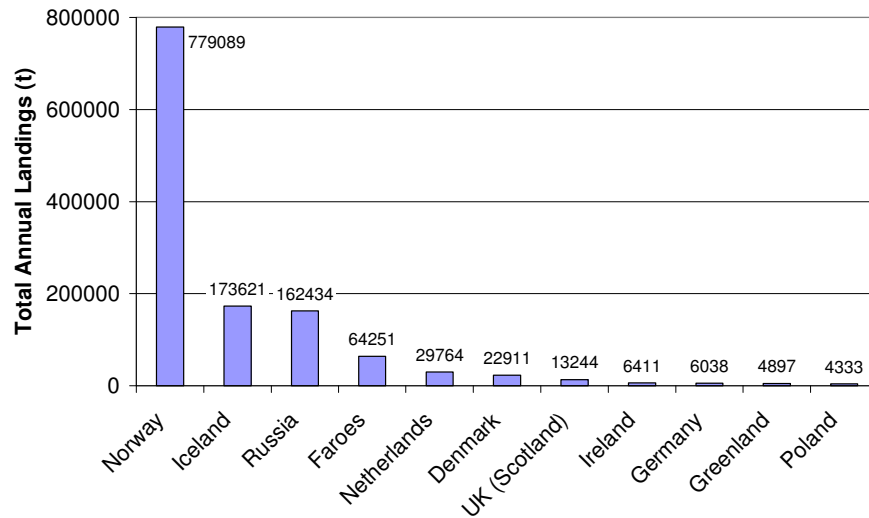
In 2009 the total allowable catch (TAC) for Atlanto-Scandian herring was set at 1,643,000 tonnes. The current share of quota allocations between EU and the coastal states was agreed in 2006, in time for the 2007 fishery. This allocates the majority (61%) of the quota to Norway. The EU, of which Scottish vessels are a part, receives an allocation of 6.5% of the TAC. The remainder is shared between the other coastal states of Iceland (14.5%), the Russian Federation (13%) and the Faroe Islands (5.1%). Figure 5 illustrates how these allocations translate into landings (once quota trading has taken place), and also gives an indication of the breakdown of landings within the EU fleet. The allocations within the EU are based upon relative stability⁵.

⁵ Relative stability was established as a principle of the first EU Common Fisheries Policy in 1983. It means that each Member States' share of each Community quota should remain constant over time.

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For 2009 the Scottish fleet received an initial quota allocation of 24,046 tonnes, representing 1.5% of the overall TAC and around 22% of the EU's overall allocation for the fishery. Although in relation to the overall fishery, the Scottish allocation appears small, from the perspective of the Scottish industry this is an extremely important and valuable resource.

Fig 5: Share of overall landings of Atlanto-Scandian Herring by nation (2007).



Source: Data derived from ICES WGWIDE (2008)

3. Target stock status & harvest controls (P1)

The first principle of the Marine Stewardship Council standard states that:

A fishery must be conducted in a manner that does not lead to overfishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Principle 1 covers all fishing activity on the entire stock - not just the fishery undergoing certification. However, the fishery under certification would be expected to meet all management requirements, such as providing appropriate data and complying with controls, therefore demonstrably not adding to problems even if the problems will not cause the certification to fail.

In the following section the key factors which are relevant to principle one are outlined. The primary sources of information on section are:

- The 2008 Report of the Working Group on Widely Distributed Stocks – Chapter 9 relates to Atlanto-Scandian (Norwegian Spring Spawning) herring.
- ICES Advice (2008) 9.4.5 Norwegian spring-spawning herring. ICES Advice 2008, Book 9. Pp.114-123.

3.1 Status of the Stock & Reference Points

ICES classifies the stock as having full reproductive capacity and being harvested sustainably. The estimate of the spawning-stock biomass is well above B_{pa} in 2008 and fishing mortality is well below F_{pa} (Table 2).

The perception of the situation of the stock and its exploitation is similar to 2007 and has not changed. The assessment indicates that the annual fishing mortality (for ages 5–14 weighted by estimated stock numbers) in recent years has fluctuated between 0.10 and 0.15 and was estimated in 2007 at 0.101. In the last 10 years, four large year classes have been produced (1998, 1999, 2002, and 2004). The 2004 year class has not yet fully recruited to the spawning stock and therefore catches and SSB are expected to increase over the next few years.

The 2002 year class is now fully recruited to the spawning stock. The estimate of the 2004 year class by this year's assessment is close to the one used by the Working Group (see section 3.2 below) in the forecast last year. The available information indicates that this is a strong year class. As a result of these large year classes and the high survival due to low fishing mortality, the SSB has increased in recent years and is estimated near 11.5 million tonnes in 2008 (more than double B_{pa}). With a TAC of 1.518 million t in 2008 and the forecast of good recruitment, SSB is predicted to increase to 12.4 million t in 2009.

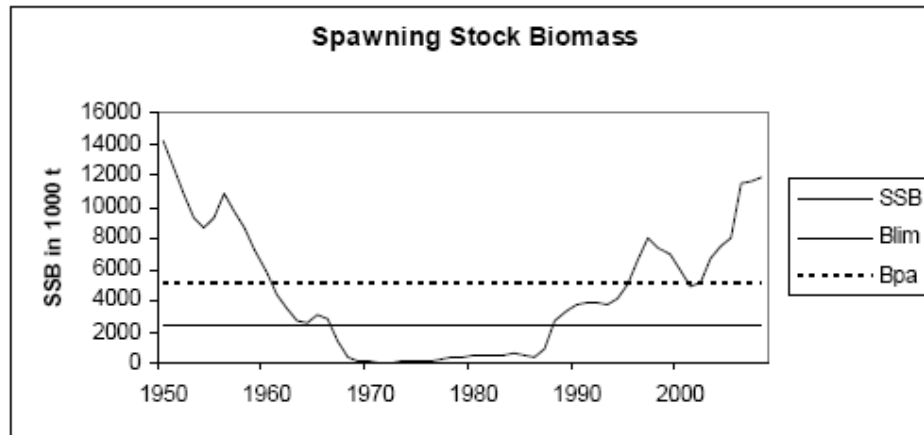
Table 2 Reference used by ICES in 2008 (ICES Advice 2008, Book 9, 9.4.5).

Type	Value	Source
Blim	2.5 million t	Interim value based on WKREF (2007)
Bpa	5.0 million t	Blim * exp(0.4*1.645) (i.e. log-normal upper 90% probability bound with 0.40 standard deviation)
Flim	not used	Not used
Fpa	0.150 year ⁻¹	Derived from the medium-term simulations
Target Fy	0.125 year ⁻¹	None specified. Set through negotiation among parties to the management plan.
F (2008)	0.118 year ⁻¹	Estimates from the 2008 stock assessment
B (2008)	11.9 million t	

The biomass limit and fishing mortality precautionary reference point were determined by a 1998 study group on the precautionary approach (ICES (1998) Report of the Northern Pelagic and Blue Whiting

Fisheries Working Group, ICES CM 1998/ACFM: 18; ICES (1999) Report of the Northern Pelagic and Blue Whiting Fisheries Working Group, ICES CM 1999/ACFM: 18). It was determined that the probability of poor recruitment increased at SSBs below 2.5 million t, which now define B_{lim} . In order to take into account uncertainty in estimating biomass, a $B_{pa} = 5.0$ million t was also proposed. Simulations indicated that $F_{pa} = 0.15$ was adequate when used in conjunction with a maximum catch ceiling of 1.5 million tonnes (ICES, 1999). The management agreement uses an $F=0.125$ to define the target catch.

Figure 6 Spawning stock biomass with precautionary and limit reference points.



There have been a number of attempts to review and improve the basis for the reference points for this stock. Estimates for B_{lim} have varied widely from 2.3 million tonnes (ICES (2003) Study Group on Precautionary Reference Points for Advice on Fishery Management. Copenhagen, 24-26 February 2003. ICES CM 2003/ACFM: 15), which is relatively close to the current B_{lim} of 2.5 million tonnes to 4.0 million tonnes (ICES (2006) Report of the Northern Pelagic and Blue Whiting Fisheries Working Group (WGNPBW). ICES CM 2006/ACFM: 34) based on the same data.

The problem was referred to the Workshop on Limit and Target Reference Points in 2007 (WKREF, 2007) after a request by the 2006 Pelagic RAC that ICES review the B_{lim} and B_{pa} for this herring stock. This workshop reviewed the biological basis of limit reference points taking into account the possible effects of species interactions and regime shifts. This task was not completed because of a lack of data, but it was possible to investigate the point at which recruitment starts to decline (identify B_{lim}). The breakpoint in the stock recruit data varied between 2 to 4 million tonnes and seemed to be very sensitive to small changes in the estimates of the poor year classes (points near the origin of the S/R plot). The technique being used to establish a limit biomass reference point for Atlanto-Scandian herring was not considered appropriate and until the methodological issue has been resolved, the current reference points will be used. The issue has been referred to a methods working group.

In summary, while the reference points cannot be determined accurately, they have been set to be consistent with the current knowledge of the fishery and appear precautionary. The history of the fishery (Figure 6) provides contrast as the stock has been depleted and has recovered to historically high levels. This should allow better estimates of reference points and current stock status, although this assumes other factors, such as environmental effects, have remained relatively constant over this period. There is a strong climatic influence on productivity and recruitment, making precise estimates of reference points difficult.

3.2 Harvest Strategy

The current harvest strategy is largely the result of the history of the fishery, which was heavily overfished in 1960s and only began to recover in the mid 1980s (Fig. 6). To aid rebuilding in 1990s to raise SSB above B_{lim} , fishing mortality was limited to 0.05 year⁻¹. ICES recommended a cautious re-

opening of the fishery in 1984 at this level of fishing mortality. After recovery, from 1996-2001, the Coastal States adopted the rule that fishing mortality would be limited to 0.15 year⁻¹ with an additional catch ceiling of 1.5 million t, with the objective of keeping SSB above 2.5 million t. Thereafter, since the stock has fully recovered, a full harvest control rule was adopted which has a target fishing mortality and aims to keep SSB above a precautionary level by applying a linear reduction in fishing mortality should SSB fall below the B_{pa} . The reference and harvest control rule was agreed by the Coastal States in October 1999 and October 2001.

The primary management control is the catch limit set according to the harvest control rule applied in a stock assessment model. The management plan was part of the international agreement on total quota setting and sharing of the quota during the years 1997–2002.

Scientific advice on the level of TAC is provided by the Working Group (WG) on Widely Distributed Stocks (WGWIDE) which meets annually and usually releases a public report in October each year. The working group consists of scientists from Spain, Russia, UK (Scotland, England & Wales), Netherlands, Norway, Faroe Islands, Iceland, Ireland, Portugal and France. It is charged with providing stock assessment advice on a number of stocks apart from Atlanto-Scandian herring. The actual management advice and a review of the performance of the harvest strategy is also made publically available annually in ICES Advice Book 9.

There is evidence that the management system is now able to implement the controls with landings being more closely aligned to the scientific advice and the TAC, by keeping fishing mortality in check. In the rebuilding phase of the stock in the 1980s and beginning of the 1990s, when SSB was less than B_{lim} (2.5 million t), the fishing mortality was kept at or below the rebuilding target (0.05 year⁻¹) with the exception of a few years. Since the stock has rebuilt, the stock has been managed in compliance with the plan and reported catches have been at or below the catch limits.

Management consensus – in particular in relation to TAC setting and division of quota - was occasionally lacking in the fishery in the past, which led to occasional overruns of advised catches. Even after the management plan was agreed and implemented, discussions aimed at allocating TAC quotas among participating states have not always been successful. In years 2003–2006, the Parties exploiting the resources (European Union, Faroe Islands, Iceland, Norway, and Russia) did not reach agreement regarding the allocation of the quota and no TAC was agreed (WGNPBW 2007). Quotas in 2006 were set unilaterally and in some countries quotas were raised during the year. Despite this allocation problem, the fishing mortality resulting from the sum of the coastal states quotas did not exceed F_{pa} .

A consultation between the managing states in 2007 finally led to a decision on quota distribution and a statement of intent to maintain stability in the ratios in the future. Since 2007, an overall TAC has been agreed. TACs for international waters are set under the responsibility of the North East Atlantic Fisheries Commission (NEAFC).

This stock has shown a large dependency on the irregular occurrence of very strong year classes. In recent years, the stock has tended to produce strong year classes more regularly. The annual monitoring, assessment and feedback should allow management to react appropriately to changes in year class abundance.

The greatest concern would be the uncertainty caused by changes in the environment. The low stock size during the 1970 – 1990, although primarily caused by overfishing, could have been exacerbated by environmental effects. In addition, the migration behaviour of the stock has changed significantly, particularly in geographical locations of the wintering and feeding areas. These, in turn, affect the distribution of the fisheries. The monitoring system appears adequate to detect and respond to these changes. However, the management system does not explicitly take account of uncertainties, but these are implicit in setting lower target levels of fishing mortality.

A minimum landing size regulation of 25 cm has also been in place since 1977, which attempts to prevent the exploitation of young herring. However, it is not clear how effective this control has been because discarding (slippage) is not recorded.

Known by-catches in the purse seine fishery consist of a small amount of large saithe chasing the herring migrations. The fisheries inspection services can close areas if the intermixture of saithe is too high.

3.3 Harvest Control Rule

The EU, Faroe Islands, Iceland, Norway, and Russia agreed in 1999 on a long-term management plan, consisting of the following elements:

1. 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.
2. 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.
3. 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).
4. The Parties shall, as appropriate, review and revise these management measures and strategies on the basis of any new advice provided by ICES.

ICES considers that the objectives and this agreement are consistent with the precautionary approach. Alternative harvest control rules have also been suggested (e.g. Lillegård *et al.*, 2005), but it is not clear they would lead to an improvement in management of this stock.

The HCR does not provide for complete closure of the fishery even if SSB falls below the limit reference point. At this overfished stage, fishing mortality would be set to 0.05, which would allow a low TAC for this stock (around 4.5% of the stock size). However, this rule was applied when the stock was considered very low, and the stock was subsequently successfully rebuilt.

Simulations have been used to evaluate the management plan, which led to the ICES conclusion that the plan is precautionary. There is presently no absolute catch ceiling in the HCR (fishing mortality being a proportion of the estimated biomass), although in the simulations a catch ceiling of 1.5 million t was included (ICES (2000) Report of the Northern Pelagic and Blue Whiting Fisheries Working Group, ICES CM 2000/ACFM:16; ICES (2001) Report of the Northern Pelagic and Blue Whiting Fisheries Working Group, ICES CM 2001/ACFM:17; ICES (2002) Report of the Northern Pelagic and Blue Whiting Fisheries Working Group, ICES CM 2002/ACFM:19). This is unlikely to have practical implications for the plan, but should catches, for whatever reason, rise significantly above 1 500 000 tonnes, it may be necessary to reconsider the precautionary nature of the plan. The maximum catch in 2008 was set to 1 518 000 t.

In 2007 and 2008 the Coastal States agreed to set a TAC in accordance with the Management Plan. The agreed shares of the Parties are 98 822 tonnes for the European Community, 78 329 tonnes for Faroe Islands, 220 262 tonnes for Iceland, 925 980 tonnes for Norway and 194 607 tonnes for the Russian Federation for a total TAC of 1 518 000 tonnes in 2008. In 2009 the coastal states agreed to set a total allowable catch (TAC) for Atlanto-Scandian herring of 1 643 000 tonnes.

3.4 Information and Monitoring

Catches

The total annual catches of Atlanto-Scandian herring for the period 1972–2007 are available by country. It is admitted that there is an unaccounted mortality caused by fishing operations and underreporting. It is not currently possible to assess the magnitude of these extra removals from the stock, and taking into account the large catches taken in recent years, the relative importance of such additional mortality has

been judged by the working group as low. Therefore, no attempt has been made to account for these factors since 1994. In previous years, when the stock and the quotas were much smaller, an estimated amount of additional unreported catch was added.

Age, Weight and Maturity

A sampling program (SALOC) has been used to derive the age composition of the total international catches of Atlanto Scandian herring (see ICES 1998/ACFM: 18). In 2007, age samples covering 94% of the total catches were provided by Denmark, Faroe Islands, Germany, Iceland, Norway, The Netherlands, Russia and Scotland. Unsourced catches were allocated to sampled ones based on where and when the catches were taken. The 1998, 1999 and 2002 year classes together account for 71% of the catches in numbers and 73% in weight.

The weight-at-age in the catches in 2007 was obtained from the same age samples. Since 1995, the weight-at-age has been relatively stable, but with a slight increasing trend. For the youngest ages, however, there has been a slight decrease during the last 1 – 2 years. Length-at-age data are available from several countries, but are not used in the stock assessment.

The growth rate of the 2002 year class has been higher than usually seen in large year classes of this stock. The proportion mature of the 2002 year class was calculated from samples collected during the surveys in the wintering area in November (before spawning) and in the Norwegian Sea in May (after spawning). The strong year classes 1991 and 1992 had a low growth, which may be the result of density dependent effects in the nursery areas.

With the exception of the 2002 year class, the proportion mature at age used in the assessment has generally been the same during the last ten years. Most fish are mature at age 5 when they are fully recruited to the fishery, and all fish are mature by age 6. The proportion mature-at-age used in assessment is based on various surveys carried out many years ago and is not always well documented. Although the working group accepted the present values for the use in the assessment, they considered that there is a need to validate the values used in particular for the most recent years.

Natural Mortality

Attempts to estimate natural mortality from tagging information (WGWIDE 2008) were consistent with values in the range 0.13 to 0.16, but could not be estimated with higher precision. Consequently it was decided to predicate the assessment model estimates on an arbitrarily chosen $M=0.15$ for ages 3 and older, and no attempt was made to include additional disease induced mortality as has been done in the past. Interim studies directed at estimating disease-induced mortality have failed to provide compelling evidence for values above zero. In the 2008 assessment, the age 15 is used as a plus group also with $M=0.15$.

In the Working Group report from 1992 (ICES 1992: Report of the Atlanto-Scandian Herring and Capelin Working Group, ICES CM 1993/Assess:6) a comparison of acoustic estimates for year classes 1983 – 1985 and 1988, and the same year classes as 3 year old (VPA) gave an average annual $M=0.88$, so $M=0.9$ was used for ages 0 – 2.

Fisheries independent information

Because of the large change in wintering patterns of the herring, the results of the winter surveys from 2003–2007 were not used in the assessment.

The international ecosystem survey in the Nordic Seas in May is the most important survey in the assessment and will remain so in future assessments. Therefore, it is important that this survey is maintained and that the vessels participating in this survey have access to the survey grounds. Due to technical and administrative difficulties the Norwegian zone east of 20 degrees east could not be covered in 2008.

These surveys show a lower abundance of the 1998 and 1999 year classes since 2003, because these year classes did not enter the area covered by the survey and the decrease of these year classes is not observed in other surveys carried out later in the year on the feeding grounds.

A number of surveys on this stock have been carried out in the Norwegian Sea and Barents Sea to estimate the size of the stock, its age composition or the recruitment to the stock. The surveys and their potential use are briefly described below.

1. In 2008 a Norwegian acoustic survey was undertaken to estimate the abundance of herring in the spawning areas in February. The survey has been carried out since 1988 but not in every year. It appears to be conducted at a time before herring have reached the spawning grounds and will be discontinued after 2008.
2. A November/December Norwegian acoustic survey has been carried out since 1992 in areas where the adult herring overwinter. Overwintering locations have changed from the fjords to the oceanic areas north of Lofoten/Vesterålen since 2002, so that fjords have been excluded from the survey from the winter 2007/2008. Given the large changes in the wintering pattern of herring and the possibility of a third unknown wintering area, it was decided not to use this survey for the period following the new wintering pattern of the herring in the assessment. The survey will be discontinued from 2008.
3. A January Norwegian acoustic survey has been carried out by Norway in the fjords in the period 1991–1999. Although the survey series has ended, the data are still used in the assessment.
4. International ecosystem surveys are carried out in the Nordic Seas and the Barents Sea and are aimed at observing the pelagic ecosystem, focusing on herring, blue whiting, zooplankton and the hydrography. The survey, run since 1995, is coordinated by the ICES (ICES CM 2008/RMC: 05) and is a cooperative effort among the parties to the management plan. This trawl-acoustic survey supplies the most important time series for the assessment of NSSH and also a time series on young blue whiting in the juvenile areas. The area covered has been somewhat varying between years and in 2008 only a small part of the Barents Sea was covered. From the area west of 20°E the age groups 4 and older are used for the assessment, whereas the Barents Sea area east of 20°E supplies the recruitment age groups 1 and 2 for the assessment. The part of the survey covering the Barents Sea has been used in the final assessment from 2005 onwards, but for the 2008 assessment it could not be used because of incomplete coverage. Although this series could act as a very important recruitment series for age 1 – 3 it is too unstable today. This has to be given high priority in the future planning of survey strategies related to this stock assessment.
5. The Joined Russian-Norwegian ecosystem autumn survey in the Barents Sea consists of a trawl survey catching 0-group herring amongst other species and an acoustic survey estimating one and two year old herring. In 2001, the Working Group decided to include data on immature herring obtained during the Russian-Norwegian survey in August-October in estimating the younger year classes in the Barents Sea.
6. A Norwegian herring larvae survey has been carried out on the Norwegian shelf since 1981 during March-April. The objectives of the survey are to map the distribution of herring larvae and other fish larvae on the Norwegian shelf and to collect data on hydrography, nutrients, chlorophyll and zooplankton. The larval indices are used as an indicator of the size of the spawning stock. In 2008 the survey was carried out from 5 – 19 April. The weather conditions were generally favourable and the coverage was considered to be adequate. The number of herring larvae found this year was very high and the total number was estimated to be 107.9*10¹². This is the highest number of larvae recorded since the time-series started in 1981.

With the exception of 1999, 2001 and 2005, tagging has been carried out annually between 1975 and 2007. In 2007 Norway has decided to discontinue the tagging programme in 2008 and in future years. The use of the tagging data in the assessment was discontinued since 2006 due to a low number of recaptures. This comes as a result of too low tag density in the stock given the high stock size and the proportion of fish screened for tags. Tagging data has been used to estimate natural mortality.

3.5 Stock Assessment

Methods

The 2008 assessment was a “benchmark” assessment, rather than an update, and therefore alternative models and procedures were applied to identify the best analytical approach. The benchmark process evaluated both the information used in the assessment and the model itself. The data used in the assessment are primarily catch and survey data.

Several age structured models have been tested and the working group is clearly exploring data and alternative modelling approaches. Data were identified that appeared informative. Analyses were conducted to test the consistency within and between the surveys and conflicts resolved between different sources of data. Then, alternative assessment methods were used to select an adequate assessment method to infer stock abundance and mortalities from the data. The models were fitted using standard software from a “toolbox”. The main structural difference between the models was the separable versus non-separable VPA, which model selectivity in different ways. Model structure did not explicitly cover effects of migration or the environment.

The performance of the non-separable VPA with respect to fits to the survey data, retrospective pattern and uncertainty in the bootstrap was marginally better than with the other models and it was chosen as the assessment model to provide scientific advice. This age structure model variant assumes catch-at-age is known exactly, but imposes no particular pattern on selectivity, which is an advantage in some fisheries and particularly pelagic fisheries where fishermen are able to change the size of the fish they target.

Short term forecasts are carried out routinely and results are presented and used for scientific advice. The TAC in 2009, corresponding with the fishing mortality of 0.125 in the agreed Management Plan, is 1.643 million tonnes. The expected SSB in 2010 is about 11.5 million tonnes. No medium term forecasts were carried out by the Working Group in the assessment.

Uncertainty

The choice of the assessment model had a minor impact on the results. The assessment is more sensitive to the choice of the data used than to the choice of the model. A major source of uncertainty is caused by conflicting signals from survey information on the youngest ages.

There has been a clear shift in wintering areas for this stock since 2003, which have affected the usefulness of winter surveys. These surveys no longer cover the whole distribution area of the stock.

Recruitment estimates of the most recent year classes are uncertain and based only on surveys in the Barents Sea. In 2008, the most important of these surveys for the assessment did not fully cover the Barents Sea. However, the estimates of the most recent year classes have little impact on the short term prediction of landings and SSB because of the late recruitment of these year classes in the catches and spawning stock.

The uncertainty of the assessments was examined by using a statistical procedure primarily testing robustness to sampling error, but not the effects of all uncertainties (such as the effect of model structure errors) and the procedure was not completed for all assessment models.

The retrospective analyses looked for bias caused by model structure error, where the model does not explain patterns in the data. The bias shows underestimation of SSB and overestimation of fishing mortality, which is in the right direction in the sense that advice based on the most recent estimates is likely to be precautionary. The retrospective trends are the same in all model configurations, and are primarily caused by these models’ inability to explain the observations on the 2002 year class. As a result, the estimate of SSB has been revised upwards for the past three years, as year classes recruited to the fishery are apparently depleting very slowly. This could be an artefact caused by changes in migration or distribution or could be caused by the survey design.

There remains considerable uncertainty over processes affecting the population dynamics. An increasingly south-westwards trend in feeding migrations could be explained by more favourable

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climatic conditions and plankton concentrations, for example, which would account for the higher growth rates and higher condition factor in these herring. But a number of other unknown factors could also be playing a part, such as the increase in stock size through density-dependent effects.

Discarding is not thought to be an issue in the fishery. Data are not available and quantitative estimates of non-landed catch mortality are not included in the assessment. Underreporting including unaccounted mortality caused by fishing operations is thought to occur but given the large catches in recent years its importance has been judged negligible.

4. Environmental elements (P2)

The second principle of the Marine Stewardship Council standard states that:

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent ecologically related species) on which the fishery depends.

The following section of the report highlights some of the key characteristics of the fishery under assessment with regard to its wider impact on the ecosystem.

4.1 Bycatch

The Scottish Atlanto-Scandian herring fishery is reported to be very clean, with limited bycatch. Information obtained from Marine Scotland (Compliance), POs, and vessel skippers indicated that slippage (i.e. opening the net and releasing the fish before they are pumped out of the water) is even less of an issue than it is in some other Scottish pelagic fisheries. The fishery for Atlanto-Scandian fisheries takes place almost entirely in the Norwegian EEZ, where discarding (which includes slippage) is illegal.

However, there remains an opportunity for slippage – as vessels are keen to only land the target species, rather than mixed landings with other species (such as mixed shoals with mackerel, blue whiting or horse mackerel). There is less of a price benefit to landing larger herring, when compared with some other pelagic species, which suggests there is little or no incentive to slip hauls with large numbers of small fish.

SPSG vessels recognise that it is detrimental to everyone's interests to slip fish – due to the impact of the stock of unnecessary mortality, and the cost in gear wear, fuel and time. As a result a number of systems are in place to minimise slippage – which has been formalised in the SPSG Sustainability Strategy such as:

- Use electronic equipment to identify target shoals
- Monitor communications, and make contact with vessels which may have already tested the mark

In addition to continuing investment in sophisticated fishfinding equipment and sonar, the SPSG fleet have good links with their Norwegian counterparts, and seek their advice as to the location and quality of different marks, so providing skippers with greater knowledge about the size and species composition of shoals before nets are shot. In spite of this there is still not absolute certainty about the composition of a shoal so some slipping could in theory, occasionally still occur – although all skippers are aware that this is illegal in Norwegian waters.

As is common with many small pelagic species, shoals of fish tend to be of the same species, often incorporating fish of similar size, and this is a feature that is specifically exploited when these shoals are fished. Skippers search for shoals of fish that are of the species, size and density that they are seeking. Whilst species recognition using sonar is not a perfect science, matters have improved significantly in recent years, and skippers are able to make realistic judgements as to whether shoals contain more than one species, and in roughly what proportions.

Although some skippers suggest that there may be some survival of slipped catches, research evidence suggests that actual mortality for slipped fish from pelagic trawls is likely to be substantial (Lockwood et al 1977, Pawson & Lockwood 1980, Holeton et al 1982, Lockwood et al 1983). In this context, scientists assume 100% mortality level when factoring a slippage estimate into assessment models.

The SPSG have recently developed a recording protocol for slippage, with a trip reporting sheet. It is a recommendation of certification that this be extended to those vessels taking part in the Atlanto-Scandian herring fishery. As slippage does not entail bringing the catch aboard it would not be possible

to accurately determine the proportions in terms of species, length / weight and sex. Reasonable estimates, based on information contained in net monitors, could be recorded.

4.2 Direct Discarding

Other than the potential for slippage (discussed above) there is no other discarding of fish (after it has been brought on-board). This is as a direct consequence of the design and layout of deck and fish handling equipment and facilities that make this difficult. When fish are pumped onboard from the net, they are fed into a system of sluiceways that allow the water to be separated from the fish, and the fish to be directed to large, below deck tanks full of refrigerated seawater. There is no mechanism for sorting or size-grading fish on deck, or for discarding fish through chutes or over the side.

Whilst it is theoretically still possible to pump fish from the RSW tanks over the side whilst at sea (this is how fish are discharged to shore), there is limited operational or economic logic to such action, and it is said not to occur. The only situation where there might be an economic incentive to discard fish from the RSW tanks is where a mixed haul is brought aboard (unusual) or where fish quality has deteriorated to the point that it is unsaleable. This type of discarding is illegal in Norwegian waters (see box below), where the fishery occurs and although not illegal in EU waters, it is strongly discouraged – both as an industry norm and by the SPSG and is not thought to occur.

Norwegian Directorate of Fisheries (2008). Regulations amending the regulations relating to sea-water fisheries (140408).

Norwegian fisheries regulations require that “in the internal waters, territorial sea and Economic Zone of Norway, it is prohibited to discard or release catches that are dead or dying (of any species) or catches of the following fish species”:

Cod	Trondheimsfjord herring	Whiting
Haddock	North Sea herring	Blue whiting
Saithe	Greater argentine	Angler (monkfish)
Redfish	Capelin	Shrimps
Mackerel	Greenland halibut	Snow crabs
Atlanto-Scandian herring		Halibut

When fishing for Atlanto-Scandian herring, all by-catch species must be retained on board, landed and the quantity set against the vessel and national quota for that species. In fisheries targeting Atlanto-Scandian herring it is also prohibited for vessels to discard fish waste. Regulations are developed on the minimum permissible size for spring spawning herring (25cm). However, an intermixture of up to 20% by number of undersized Norwegian spring-spawning herring is permitted in each catch. Other protective measures are the prohibition of the use of drainage grids that can be used as sorting equipment in the water separator or chutes leading from the water separator (drainage system).

4.3 Endangered, threatened and protected species (ETP)

In general, populations of endangered, threatened and protected (ETP) species are highly studied and well understood in the area of the fishery, with considerable work undertaken in relation to the regular monitoring of fishing activity through the deployment of onboard scientific observers, capture of anecdotal information, and a wide range of monitoring activity associated with the planning and management.

The UK is one of the 10 countries that are signatories to the "Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas" (ASCOBANS) which was concluded in 1991 under the auspices of the Convention on Migratory Species (CMS or Bonn Convention) and entered into force in 1994.

The agreement seeks to formalise and coordinate efforts to conserve the small cetacean species shared between member countries in the ASCOBANS Area, conscious that the management of threats to their existence, such as bycatch, habitat deterioration and other anthropogenic disturbance, requires concerted and coordinated responses, given that migrating cetaceans regularly cross national boundaries.

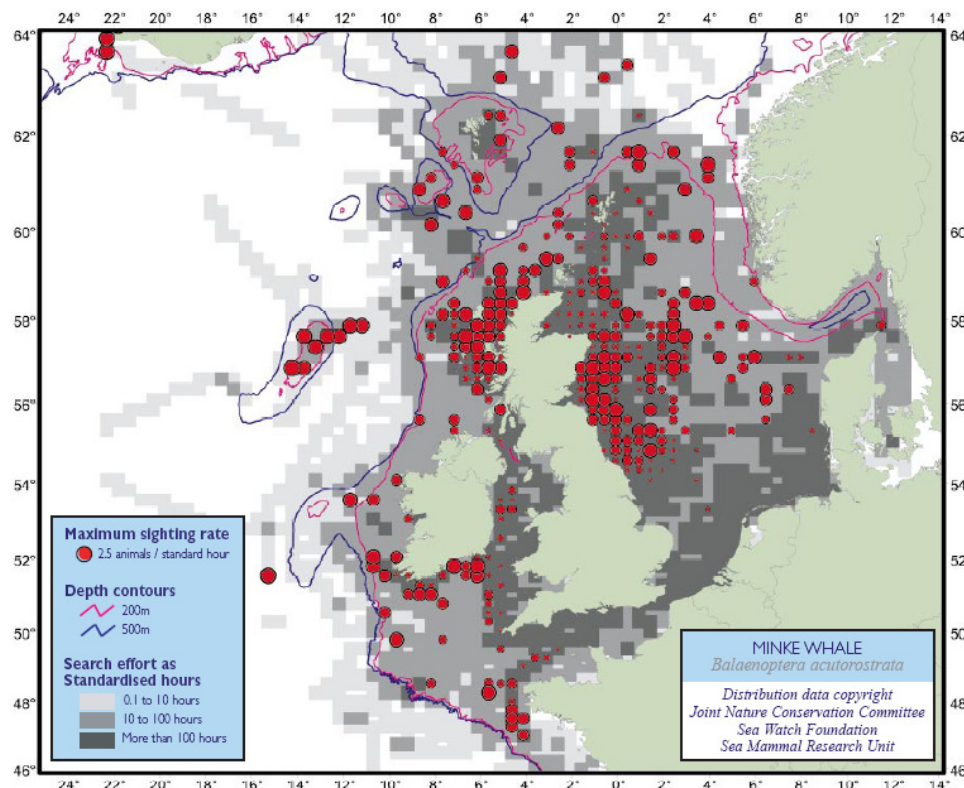
A Conservation and Management Plan forming part of the Agreement obliges Parties to engage in habitat conservation and management, surveys and research, pollution mitigation and public information.

Other recent projects have focussed on mapping small cetacean in North East Atlantic waters (often focussing on the North Sea). A recent notable example has been the Small Cetaceans in the European Atlantic and North Seas project (SCANS & SCANS II). The project is coordinated by SMRU and is financed by the EU LIFE-Nature funding which is intended for projects that contribute to the implementation of Community nature protection legislation: the "Birds" Directive (79/409/EEC) and the "Habitats" Directive (92/43/EEC). The project aims to:

1. determine the absolute abundance of small cetacean populations
2. develop and test methods to monitor cetacean populations
3. develop a framework for management of bycatch

The Scottish ASH fishery principally operates in SCANS survey area M & E. This suggests that the cetacean species that the fishery is most likely to overlap with is harbour porpoise (*Phocoena phocoena*) and Minke Whale (*Balaenoptera acutorostrata*), and to a much lesser extent whitebeaked and whitesided dolphins (*Lagenorhynchus albirostris* & *Lagenorhynchus acutus*).

Fig 7: Distribution of Minke Whale in and around the North East Atlantic



Source: Atlas of Cetacean distribution in north-west European waters (Reid *et al* 2003)

Interactions between Scottish Atlanto-Scandian herring fisheries and ETP species are considered very limited on the basis of consultations with the Sea Mammal Research Unit (SMRU – St Andrews University) and on the evidence from skippers and from interpretations of relevant observer programmes. SMRU and others have undertaken extensive surveys to determine the level of bycatch of sea mammals in UK pelagic fisheries, which highlights which fisheries are the most likely causes of cetacean bycatch. Attention has principally focussed on gill net fisheries, pelagic pair trawling for bass in the Western channel and although some pelagic trawl fisheries have been identified as higher risk, this tend to be the fisheries operating in areas of higher cetacean concentrations, in particular south west of Ireland – well away from the fishery under assessment.

The assessment team is therefore satisfied that the main impacts of the Scottish Atlanto-Scandian herring fishery are known and that these are highly likely to be within the limits of national and international requirements for protection of ETP species, and are highly unlikely to create unacceptable impacts to ETP species.

4.4 Habitat

The pelagic fishing gear used in the SPSG RSW Atlanto-Scandian fishery is not designed to come in contact with the sea bed. The net remains within the water column, and would be immediately (and expensively) damaged were it to come in contact with seabed structures. Skippers have good control over the position of the net, and once again the use of technology reduces the likelihood of any interaction. A net monitor (sonar) with a transducer actually on the net enables skippers to accurately fish to within a couple of meters of the seabed without making contact.

There is far less danger of gear loss in pelagic fisheries than in demersal. This is partially due to the lack of contact with the seabed, but also because the nets are far lighter. For example, were a demersal trawl net to become entangled in, for instance a wreck, the heavy ground chain would not break. By contrast any pelagic net entangled in such a way would more easily break and be recovered.

Measures to minimise seabed/ fishing gear interactions are in place across the fleet and include the use of sophisticated electronics, including depth sounders, sonars and trawl monitoring systems. Scanning sonars on all vessels reveal seabed depth and topography for up to 1.5 miles ahead of the vessels, meaning that there is sufficient advance warning of changes in depth or seabed obstructions to allow altering of course or raising of the gear. Rapid changes to the depth of the net can be made directly from the wheelhouse via the winches. All vessels use trawl-monitoring sensors. Sensors are attached to the net and wheelhouse monitors display data in relation to the spread and height of the net opening, depth of the footrope of the net and the clearance between the footrope and the seabed.

In addition, there is good understanding of the habitat nature and vulnerability in the area of the fishery. The Norwegian Institute of Marine Research have undertaken extensive seabed and habitat mapping exercises in the Norwegian Sea, and timely management action is carried out (where appropriate) based on the findings of this research. For example, the Institute of Marine Research commenced a program for mapping and assessment of Lophelia reefs in 1997. This has provided an extensive database of coral occurrences, both damaged and undamaged sites and enables potential coral areas to be identified by analysing seafloor topography on maps. This has been used to inform the establishment of MPAs at a number of key coral habitats.

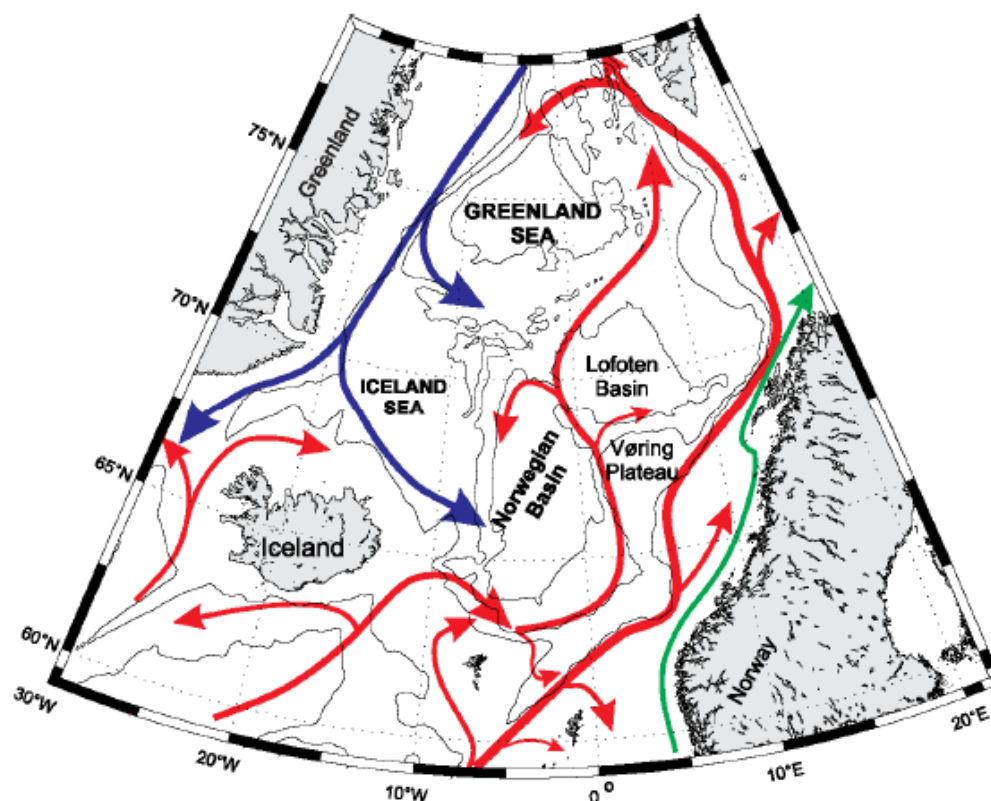
As a result, habitat issues are not a significant concern in the assessment of this fishery.

4.5 Ecosystem impacts

The 2008 report on the ICES Working Group for Regional ecosystem description provides an excellent summary of the Norwegian Sea ecosystem where the fishery takes place (WGRED 2008). There is considerable knowledge of the habitats and ecosystem of the Northern North Sea and Norwegian Sea, drawing on more than one hundred years of regular monitoring and research, the intensity of which has accelerated in recent decades. The food web of the region has been studied over many years and is reasonably well understood, and there is a good level of information on the trophic position of herring's key life stages within this web.

Atlanto-Scandian herring is a straddling stock. Juveniles and adults play a key role in the ecosystem of the region both as a food resource to higher trophic levels (e.g. large fish, seabirds, and marine mammals), and as a consumer of zooplankton. The present high stock size will therefore have positive effects predators, but perhaps more negative effects on other pelagic species such as blue whiting and mackerel which are competitors for the same food resource.

Figure 8. Main circulation patterns of the Norwegian (red lines indicate warm currents, blue lines indicate cold currents and green lines show low salinity coastal water).



Source: WGRED 2008

Unintended fishery effects on the ecosystem are probably small or absent. Since herring is a major food resource for some other species, overfishing could affect these populations. This is presently not the case since the herring stock is very abundant and is exploited at a low rate (ICES WGWIDE 2008).

Other ICES studies are also available on the ecosystem structure and function, in 2008 including advice (ecosystem overview) for both the Norwegian Sea and The North Sea – both of which have been used to inform scoring of this fishery.

In managing potential habitat and ecosystem impacts, industry and management authorities are guided by UK commitments to a number of relevant conventions and agreements, such as:

- **OSPAR Biological Diversity and Ecosystems Strategy** which is concerned with all human activities which can have an adverse effect on the protection and conservation of the ecosystems and the biological diversity of the North East Atlantic. The Strategy (i) sets ecological quality objectives in support of the ecosystem approach to the management of human activities, (ii) requires assessments of species and habitats that are threatened or in decline, (iii) the development of an ecologically coherent network of marine protected areas and (iv) the assessment of human activities which may adversely affect ecosystems and the development of programmes and measures to safeguard against such harm.

- **Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora** came into force on 21 May 1992. The central aim of the Directive is to conserve biodiversity across the area of the European Union through a coherent network of Special Areas of Conservation (SACs).
- The **Convention on Biological Diversity** was signed at the UN Rio Conference on Environment and Development (1992). This aims conserve biological diversity, encourage sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of these resources.

The Pelagic fishing fleet has robust and comprehensive systems in place to minimise any wider ecosystem impacts caused by waste pollution of any kind. The majority of these are legislative requirements in order to comply with MARPOL legislation. For example, all waste oil must be recorded and properly disposed of as a requirement of the licence, and catering waste is recorded and brought ashore. As a result of these systems it is not thought the SPSG Atlanto-Scandian herring fleet contributes to either marine litter or pollution. More sophisticated assessments of impact such as carbon foot printing are not required as part of the MSC assessment, however pelagic trawling is a more efficient use of fuel than demersal trawling.

5. Administrative context (P3)

The third principle of the Marine Stewardship Council standard states that:

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

In the following section of the report a brief description is made of the key characteristics of the management system in place to ensure the sustainable exploitation of the fishery under assessment.

5.1 Legal and customary framework

This fishery is predominantly exploited by Norway (61%), with participation by Iceland (14%), Russia (13%), the Faroe Islands (5%) and EU Member Countries (7%)⁶. As such, most fishing activity is subject to the laws of Norway, Iceland and Russia. Scotland has about 1.5% allocation of the overall TAC for this fishery.

For vessels registered in Member States of the European Union, participation in this fishery is subject to the Common Fisheries Policy of the EU. This policy came into being in the form we recognise today in 1983. It was reviewed thoroughly in 2002 and the current basic fisheries regulation (No.2731/2002) was adopted by the Council of Ministers on 20 December 2002.

This regulation sets out the strategic aims of the CFP and enables the Council of Ministers, or in certain cases the Commission, to make more detailed Regulations on such issues as control requirements, fleet structure, technical conservation, marketing and annual total allowable catches (TAC) etc..

Outside of the CFP framework other EU legislation deals with habitats and species protection; such legislation is also relevant to fisheries management and to the activities of fishermen.

At a national level implementation of the CFP is the responsibility of individual Member States – governed by the EC legislation itself, or by primary and secondary national legislation enacted in conformity with the EC legislation. National fisheries administrations are responsible for a range of management and regulatory duties, including:

- management of fleet activity,
- management of national quota,
- monitoring and control of all fisheries occurring within national jurisdiction,
- collection, collation and transmitting of key fishery data, and
- undertaking at least a base range of scientific monitoring and development work.

The Scottish fleet exploiting the Atlanto-Scandian herring does so mainly by fishing within the Norwegian EEZ. As such, the fleet is not only required to comply with EU and UK legislation, but is also required to comply with relevant Norwegian legislation and practices.

5.2 Consultation, roles & responsibilities

The main institutions involved in management of the Scottish Atlanto-Scandian fishery are:

- NEAFC – responsible for coordination of the annual Coastal States Agreement
- ICES ACOM – provides the forum for consolidation of scientific work undertaken by scientists in participating national institutions (through relevant Expert Groups), and the delivery of advice on how best to manage fish stocks –including the Atlanto-Scandian herring
- DG MARE of the European Commission – responsible for advising on the management of European fisheries through the Common Fisheries Policy

⁶ percentages refer to landings in 2007

- STECF – the fisheries scientific committee of the European Commission providing advice to the Commission on all aspects of fisheries science
- Defra – UK Department for Environment, Food and Rural Affairs responsible for management of UK fisheries
- Marine Scotland Sea Fisheries Policy – Department within the devolved Scottish government responsible for management of Scottish fisheries
- Marine Scotland Compliance – Division responsible for monitoring, control and surveillance of the Scottish fleet, and such other licensed vessels fishing within Scottish jurisdiction
- Scottish Pelagic Fishermen's Association – responsible for representation of the interests of the Scottish pelagic fleet and fishermen
- Scottish Fishermen's Federation (SFF) – responsible for representation of all Scottish fishing industry interests
- Scottish Pelagic Sustainability Group (SPSG) – responsible for coordination of achievement of certification of Scottish pelagic fishing industry to the highest standards of sustainable practice
- Producer Organisations with Scottish pelagic vessel membership – SFO, SFPO, Lunar, Klondyke (and NIFPO) – responsible for monitoring and management of vessel quota uptake, amongst other things.
- The Pelagic Regional Advisory Council (P-RAC) – one of six advisory councils established by industry and the European Commission for the purposes of securing industry views and advice on the management of pelagic fisheries.

All of these institutions have well established protocols covering their purpose, roles, operation, representation, consultation, decision-making, dissemination of policy, plans, decisions and information, and both internal and external review of practices and performance.

5.3 Long term objectives

The Atlanto-Scandian herring fishery is managed through a management plan developed jointly in 1997 by the EU, the Faroe Islands, Iceland, Norway and Russia (the Coastal States Agreement), and updated annually thereafter. The main points of this plan include:

- Maintaining the SSB above 2 500 000 tonnes (B_{lim});
- Setting a TAC consistent with a fishing mortality of 0.125 (from 2001 onwards);
- When the SSB falls below 5 000 000 t (B_{pa}), ensuring its recovery by modifying the fishing mortality according to a linear reduction from 0.125 at B_{pa} to 0.05 at B_{lim} .

There are clear procedures that are regularly used for the measurement of SSB and F, and for measurement of performance relative to SSB and F. These are consolidated and reported upon by the relevant ICES Working Group – the Working Group on Widely Distributed Stocks (WGWIDE).

5.4 Incentives for sustainable fishing

Over the last two decades concentration within the Scottish pelagic fleet has been underway, complemented by significant fleet renewal / replacement. These changes have been achieved without public subsidy. This has allowed for a better matching of fleet and technology employed with the fishing opportunities available. The driving forces behind these changes have been profit-oriented, but incorporating best practice and most cost-effective technology, including deployment of technologies expected to reduce incidences of avoidable bycatch and increase the quality and value of catches made.

There has been significant investment in research projects – both from private as well as public sources – intended to improve fishing practices, and the technologies available.

Since the 2002 revision of the CFP, subsidies that contribute to unsustainable fishing have stopped. There is no support to increase capacity, or to compensate for low catches. The industry does not pay directly for management or science, though on balance this is not considered a subsidy to fleet operation.

Some NGOs have in the past questioned whether development support through the EC's structural funding mechanisms to the fishery sector –the European Fisheries Fund (EFF) – constitutes continuing subsidy to the sector. In recent rounds of such development funding, financing restrictions have been tightened.

A preferential tax system is applied to diesel across all EU primary production sectors. This is deemed by some to constitute a subsidy to operation. It is difficult to sustain this argument on a relative basis, as on the whole, European countries apply a far higher level of taxation on fuel than any other economic block in the world (with the exception of Japan).

5.5 Fishery-specific objectives

This fishery is managed in line with the long-term objectives established as part of the Coastal States Agreement, and in line with the advice provided by ICES. This is interpreted and applied at EU, national and fleet levels through a tiered process of review, consultation and planning – in conformity with EU and national policy. This includes a range of input and output controls.

At an operational level short-term objectives are primarily represented by output controls linked to the annual setting of Total Allowable Catch (TAC). Achievement against this annual target is monitored at national level on a monthly basis. The TAC for Atlanto-scandian herring is established in the course of negotiations of the Coastal States Agreement, taking into consideration the advice provided by ICES. Management is by agreed Reference Points and Harvest Control Rule.

The allocation of the TAC to different fishing nations is also agreed at this time. That allocated to the EC is distributed between its Member States according to an "allocation key" ("Relative Stability") established at the time of the foundation of the CFP. Since only a few EU Member States actually fish the Atlanto-Scandian stock, quota allocated to Member States that do not wish to fish the quota themselves is typically swapped in return for fishing allocations of greater relevance to the fleets of those countries.

In respect of the UK pelagic fleet relevant quota allocation is shared out between the member vessels on the basis of a system of Fixed Quota Allocations (FQA's) (allocation on the basis of historic rights plus transfers arising from fleet concentration and trade in the entitlement to fish quota). In the UK pelagic fleet this is effectively synonymous with Individual Transferable Quotas (ITQs). The Producer Organisations are responsible for monitoring and managing uptake of quota by their respective members. This information is used to monitor national uptake, and the facility exists to stop the fishery nationally once the quota is taken up.

5.6 Decision-making processes

At an international scale, decisions are taken in relation to the overall level of the TAC (based on ICES advice), and how this should be allocated among the nations that target the shared resource – the EU, Norway, Faroes and Russian federation and Iceland.

The SPSG vessels all receive a share of the EU quota. All EU member states have signed up to the CFP, and are bound by European legislation. Disputes between Member States and the Commission are resolved in the Council of Ministers. Where appropriate, European legislation is enacted at the national level through relevant primary and secondary legislation. Formal procedures apply for the resolution of disputes through the national court systems.

Extensive consultative processes are in place at national and European levels to debate policy, plans and management, and recent years have seen the introduction of more formal procedures to

incorporate a wider stakeholder community within such consultations. Key institutions in this regard are the Advisory Committee on Fisheries and Aquaculture (ACFA) - which comprises a contact group at the European level for all stakeholders at national and regional levels – and the Regional Advisory Councils (RACs) – which comprise a contact group dealing with particular fisheries at the regional level. There is a Pelagic RAC that deals with issues relating to the Atlanto-Scandian herring fishery, amongst other pelagic fisheries.

Within the fisheries administrative structures of each member state there are a wide range of bodies and committees through which problems can be raised and disputes debated and resolutions found. Local government and relevant planning committees also have a range of tools at their disposal to both inform and resolve relevant disputes.

Outside the machinery of government, there are a wide range of institutional solutions to dispute resolution – through trade organisations, professional associations, and a range of decision-making bodies (at local, regional and national levels).

5.7 Compliance and enforcement

The UK is a Member State of the European Union, and its fisheries are subject to the principles and practices of the Common Fisheries Policy. Elements of Member State compliance with EC Regulations are captured in the annual EC fisheries compliance scoreboard – http://ec.europa.eu/fisheries/cfp/control_enforcement/scoreboard_en.htm.

The activities of the SPSG vessels, like similar vessels across the European Union, are tracked by satellite, and their catches and landings are monitored through logbook declarations, at-sea and on-shore inspections, and supply chain monitoring. The key elements of this system are also upheld by the Norwegian administration, and data is shared between the Member States of the European Union and between the EU and Norway. In this way the activities of the SPSG fleet can be comprehensively monitored by UK and Scottish authorities, even where fishing is undertaken in Norwegian waters, and where landings are made to ports outside Scotland.

In relation to TAC, there is a clear system of data collection, testing and feedback, and there is regular inspection of landings. When SPSG vessels are fishing in the “Norwegian sector” there are regular inspections at sea by the Norwegian navy, and fleet activity is monitored by aerial surveillance and through a satellite mediated VMS (Vessel Monitoring System). All non-Norwegian vessels fishing in Norwegian waters are required to comply with relevant Norwegian legislation, and to make themselves available for inspection by the Norwegian Navy at nominated points inside the Norwegian EEZ before being cleared to “cross the line” into EU waters.

The machinery of the EU and Norwegian systems (operational procedures) is well developed, is in place, and is applied in a clear and transparent way. Non-compliance is dealt with by the relevant national authorities through their criminal justice systems, and using agreed and tested procedures.

In the early 2000s the Scottish pelagic fleet was found to be in contravention of catch limits for a number of pelagic fisheries (notably North Sea herring and North East Atlantic mackerel), and was heavily fined and penalised for these offences. Management authorities and industry instituted major changes in terms of far more stringent and better resourced reporting, monitoring and surveillance (such substantially increased inspections of landings and factory throughput) and since 2006 the fleet is considered by all relevant management bodies to be in compliance with the management regime. Whilst exploitation of the Atlanto-scandian fishery by the Scottish fleet has not been subject to such irregularities, it has also been confirmed by Marine Scotland Compliance that the fleet is operating in full compliance of the rules.

5.8 Research plan

The core backdrop to the management of this fishery is the advice provided by the ICES Advisory Committee (ACOM) which draws on the on-going work of international scientists from relevant research laboratories and institutions on the stock biology and marine science.

Scientific research and assessment is carried out by ICES Working Groups and specialist study groups. The assessments are reviewed and evaluated by the ICES Advisory Committee (ACOM) which then provides advice on the status of target and non-target stocks to the European Commission. ICES advice, via Commission proposals, informs the annual EU Council of Ministers regulation establishing management measures, in particular TACs and quotas.

Stock assessment and data gathering methodologies are regularly reviewed - at ICES level and at the level of the contributing laboratories and research institutions. Within ICES, a methods working group keeps methods for fish stock assessment under regular review, and there are specific working groups dealing with various issues relevant to the fishery. In addition, other study and working groups exist to review, for example, herring surveys, the precautionary approach, discards, biological sampling, the "Life Cycle and Ecology of Small Pelagic Fish", and the "Incorporation of Additional Information from the Fishing Industry into Fish Stock Assessments".

Scientists from Marine Scotland Research (formerly Fisheries Research Services Aberdeen) are actively involved in research in pelagic stocks and relevant ICES expert groups. But given the particular importance of the Atlanto-scandian herring stock to the Norwegian fishery economy, most of the relevant research on this stock is undertaken by the Norwegian scientific establishment, albeit in cooperation with scientists from other relevant fishing countries.

At a more local level, research on fishing techniques, bycatch reduction, and improvements in technology are encouraged and applied through regular cooperation between industry, research laboratories and other research institutions supported by funding from EC funding mechanisms and or the UK research councils.

It is also interesting to note the fleets involvement with science. For example, one of the vessels 'Sunbeam' is now fitted with the latest Simrad SX93 dual mode sonar which has a dedicated scientific output which allows the vessel to participate in scientific research projects. As an example of performance the article mentions that 'Sunbeam' recently located a mackerel shoal which it was able to measure at 3.5km long, 50m deep and containing an estimated 200,000t of mackerel.

5.9 Monitoring and evaluation

The management system is subject to regular internal review (as required by the CFP). This occurs at every level of the system with policy documents formulated at a European Commission level as a result of initiatives at national, sub-national and European levels. These policies and resulting operational plans and practices are then subject to wide consultation before ratification, and prescribed monitoring and evaluation processes after ratification. These systems also include formal consultation and review processes involving all EC Member State fisheries administrations, and committees such as ACOM (the body through which ICES provides formal advice), STECF (the committee by which the European Commission seeks expert opinion on fisheries), the Advisory Committee on Fisheries and Aquaculture (ACFA) dealing with industry concerns at a European / "horizontal" level), and the Regional Advisory Councils (RACs) dealing with regionally specific technical issues (of which the body specifically incorporating herring industry interests is the Pelagic RAC).

A wide range of normative monitoring of fisheries practice and the work of the various management institutions also takes place. This includes data collection on vessels (vessel register), fleet activity (days at sea, VMS), landings, catches (through scientific observer programmes), and operating economics (costs and earnings surveys). In terms of institutional performance, regular monitoring against performance targets is undertaken in respect of statistics collection, quota management, aerial, at sea, and on-shore inspections, checks across the audit trail, fisheries enforcement (including prosecutions), and the nature and extent of development support to the sector.

On balance, management plans are modified on an annual basis, and the various review processes do ensure that systems adapt to changing circumstances, and are subject to critical inspection. There are various checks and balances of the management system in place, but it has to be said that this is not always a regular, rapid or formalised process.

SPSG Atlanto-Scandian Herring Fishery

This is an industrial scale activity, in terms of scale and intensity of both the SPSG fishery and indeed the international fishery, and control, management and administration are designed accordingly. Specifically the management system, which includes complex and comprehensive MCS (Monitoring, Control, Surveillance), is appropriate to the scale of this consolidated, modern and large-scale industry.

In addition the harvest control rule, agreed by the coastal states (Norway, EU, Russia, Iceland and Faroes) and which determines the level of the TAC is also reviewed by ICES scientists.

6. Background to the evaluation

6.1 Evaluation team

Evaluation Leader: Tristan Southall

This evaluation was led by Tristan Southall, an experienced fisheries assessor who has worked as both principle 2 and principle 3 expert on a number of previous MSC assessments, including the Scottish Pelagic assessments for both herring and mackerel. More recently Tristan has been involved in the development and trialling of a new MSC assessment methodology, based on risk analysis, for use in data deficient situations.

When not assessing the sustainability of fisheries Tristan specialises in fishing and marine industry consultancy, combining detailed understanding of marine ecosystems with broad experience of fishing and aquaculture industry systems, infrastructure and management. This provides him with an informed position which balances the needs of marine ecosystems, biodiversity and wider environment with the practicalities of the industry operation. Bridging these two important areas enables sustainably-minded consultancy, able to interpret and advise upon the impacts of different management decisions on both marine ecosystems and economics.

Tristan's professional experience also includes the evaluation of fisheries on sub-sea environments, analysis of fishery and fleet performance, and a wide range of fisheries and aquaculture planning and management studies, all of which seek to combine both socio-economic and environmental perspectives. Tristan has recently coordinated EU fisheries training and promotion activities – covering all aspects of sustainable fisheries management and control, and co-authored the Fisheries Management Plan for the Sea of Marmara.

Expert Advisor: Martin Gill

Martin Gill, the Managing Director of FCI, coordinated the assessment process, and participated as a team member during the assessment as required. Martin is a marine biologist and fisheries specialist, a former staff member of the Copenhagen-based Eurofish international fishery development organisation, and is a shareholder and board member of Food Certification International.

Martin was appointed as Executive Director of Food Certification (Scotland) Ltd in June 2002 and led a successful management buyout in early 2007. He joined from a five year period with FAO EASTFISH, a Food and Agriculture Organisation of the United Nations project providing a fish marketing and investment service for Central and Eastern Europe based in Copenhagen. (This project is now known as Eurofish). Among other duties he acted as the founding editor of the organisation's Eurofish magazine.

A graduate in Marine Biology from University College, Swansea, he was also a former Editor of World Fishing magazine for 5 years and has contributed since 1992 to the Encyclopaedia Britannica Book of the Year with the commercial fisheries section.

Expert Advisor: Dr Paul Medley

Dr Medley is an experienced stock assessment specialist, will assist with analysis of the fishery management systems in place, assessment of stock health. He is a fishery biologist and population dynamicist with particular experience with respect to pelagic fisheries, shellfish and small-scale fisheries, and wide experience with MSC pre-assessment and full assessments. Dr Paul Medley is an experienced fishery scientist and population analyst and modeler, with wide knowledge and experience in the assessment of pelagic stocks (amongst a range of marine fish stocks and ecosystems). He has travelled widely and worked with a range of fishery systems and biological stocks, both as principal researcher and as evaluator. He is familiar with MSC assessment procedures, having participated in the first MSC full assessment – Thames herring – and is currently working with the MSC on the development of guidelines for certification of small scale, data poor fisheries. He has also participated in the full assessment of the South Georgia toothfish fishery, and with a number of pre-assessments. He is familiar with a wide range of fisheries in the North East Atlantic, and other parts of the world, and over

the period 2000 to 2005 he has been serving with the Centre for Independent Experts, University of Miami, as an evaluator of various US fishery research programmes. He is based in York.

Expert Advisor: Crick Carleton

Crick Carleton, chief fisheries assessor for FCI / Nautilus is an experienced industry analyst with some thirty years experience in fisheries management, policy and development, drawing on academic qualifications in both natural sciences and economics (zoology and technological economics), and work as a fishery officer and full-time consultant. He is the founder and Chief Executive of Nautilus Consultants and has actively supported the evolution of the MSC standard. He participated in the Airlie House revision of the MSC's Principles and Criteria to the current standard, and has contributed to debate on its application to small-scale fisheries and aquaculture. He is an experienced facilitator, works extensively with fishing communities and businesses, and regularly mediates in a range of sensitive management and development situations.

6.2 Public consultation

Public announcements of the progression of the assessment were made as follows:

Date	Purpose	Media
02.04.09	notification of commencement of assessment	notification on MSC website
02.04.09	nomination of Assessment Team candidates	notification on MSC website
throughout	solicitation of inputs to stakeholder consultation and assessment	email, phone and mail
09.04.09	posting of Assessment Tree and Scoring Guideposts	notification on MSC website
09.04.09	announcement of assessment visit and convening of stakeholder consultation meeting	direct email, notification on MSC website
18 th – 22 nd May09	assessment visit	meetings
08.09.09	notification of Proposed Peer Reviewers	Notification on MSC website
24.12.09	notification of Public Comment Draft Report	Notification on MSC website
08.02.10	notification of Final Report	Notification on MSC website

6.3 Stakeholder consultation

Extent of available information

A total of 51 stakeholder organisations and individuals having relevant interest in the fishery assessment were identified and consulted during this assessment. The interest of others not appearing on this list was solicited through the postings on the MSC website, and by advertising in the "Fishing News" publication.

Initial approaches were made by email and followed up by phone conversations. Issues raised during correspondence were investigated during research and information gathering activities, and during interviews.

Most stakeholders contacted during this exercise either indicated that they had no direct interest in this fishery assessment, or that they had no particular cause for concern with regard to its assessment to the MSC Standard.

Stakeholder issues

Written and verbal representations were provided to the assessment team expressing a range of views, opinions and concerns. The team is of the view that matters raised have been adequately debated and addressed as a part of the scoring process for this fishery, and that none of the issues raised, therefore, require separate attention beyond that represented in this report.

6.4 Interview programme

Following the collation of general information on the fishery, a number of meetings with key stakeholders were scheduled by the team to fill in information gaps and to explore and discuss areas of concern. Meetings were held as follows:

Table 3: Stakeholders interviewed as part of the SPSG ASH Assessment.

Name	Position	Organisation
Derek Duthie	Director/Company Secretary Chief Executive	SPSG Scottish Pelagic Fishermen's Association
Mark Buchan	Skipper of "Quantus"	SPSG
Staale Hansen	Skipper of "Challenge"	SPSG
Alex Wiseman	Skipper of "Kings Cross"	SPSG
Davie Hutchison	Skipper of "Carisma"	SPSG
Andrew Whyte	Skipper of "Forever Grateful"	SPSG
Ian McFadden	Chairman Director	Herring Buyers Association Ltd SPSG
David Terry	Area Manager	Marine Scotland - Compliance
Colin Faulkner	Team Leader	Scottish Government Marine Directorate
Damon Hewitt	Stock conservation and negotiations policy officer	Scottish Government Marine Directorate
Craig Davis	Observer Programme Manager	Marine Scotland - Science
Arl Slotte	Pelagic fishery scientist	Norwegian Institute of Marine Research
Brian Isbister	Chief Executive Director	Shetland Fish Producer's Organisation SPSG

6.5 Other certification evaluations and harmonisation

The client for this fishery certification – SPSG – has already undergone two successful MSC fishery assessments. These are detailed below:

- SPSG Western component of North East Atlantic Mackerel
- SPSG North Sea Herring

As both of these previous assessments relate to the same vessels, the same landing procedures and the same enforcement controls (albeit this assessment places more emphasis on Norwegian controls), there are potential harmonisation issues. Although these previous assessments were undertaken using the previous MSC Assessment Tree, it is not thought that this assessment has raised any contradictory findings. In both cases the assessments were carried out by FCI who also act as the certification body for this fishery assessment.

In addition there have been previous assessments on this stock (referred to by others as Norwegian Spring Spawning, rather than Atlanto-Scandian herring), for other fleets. To date there have been 2 previous MSC assessments for the stock:

- Danish Pelagic Producers Organisation – Atlanto-Scandian herring - certified as sustainable 21st July 2009.
- Norges Sildesalgslag - Norway spring spawning herring – certified as sustainable 30th April 2009.

Additionally there is an on-going assessment for Faroese Pelagic Organization Atlanto-Scandian herring. The outcome of these completed assessments have been considered in the current assessment and referred to during the scoring exercise to improve consistency of approach. Any inconsistencies observed do not impact on overall conclusions and conditions of the assessment.

6.6 Information sources used

The principle sources of information used in this assessment process derive from information presented to the team by the client and fishery managers, by information derived as a result of interviews and consultations with members of the fishing industry, processors, regulators, and other stakeholders, and as a result of literature review. The primary sources of information on this stock and the fishery are:

- 2008 Report of the Working Group on Widely Distributed Stocks – Chapter 9 relates to Atlanto-Scandian (Norwegian Spring Spawning) herring.
- ICES Advice (2008) 9.4.5 Norwegian spring-spawning herring. ICES Advice 2008, Book 9. Pp.114-123.

Taken in combination these provide a clear and consolidated view of Atlanto-Scandian herring stock, the fisheries that exploit the stock, and the science behind advice on the management of the stock. Appendix 2 of this report provides full references for these reports as well as detailing a number of other sources that have been used in this assessment. The assessment tree used to score the fishery (Appendix 3) also provides full references, to justify scoring against each of the performance indicators.

7. Scoring

7.1 Scoring Methodology

Process

The MSC is dedicated to promoting “well-managed” and “sustainable” fisheries, and the MSC initiative focuses on identifying such fisheries through means of independent third-party assessments and certification. Once certified, fisheries are awarded the opportunity to utilise an MSC promoted eco-label to gain economic advantages in the marketplace. Through certification and eco-labelling the MSC works to promote and encourage better management of world fisheries, many of which have been suggested to suffer from poor management.

The MSC Principles and Criteria for Sustainable Fisheries form the standard against which the fishery is assessed and are organised in terms of three principles:

- **MSC Principle 1 - Resource Sustainability**
- **MSC Principle 2 - Ecosystem Sustainability**
- **MSC Principle 3 - Management Systems**

A fuller description of the MSC Ps & Cs and a graphical representation of the assessment tree is presented as **Appendix 1** to this report.

The MSC Principles and Criteria provide the overall requirements necessary for certification of a sustainably managed fishery. To facilitate assessment of any given fishery against this standard, these criteria are further split into sub-criteria. Sub-criteria represent separate areas of important information (e.g. Sub-criterion 1.1.1. requires a sufficient level of information on the target species and stock, 1.1.2 requires information on the effects of the fishery on the stock and so on). These Sub-criteria, therefore, provide a detailed checklist of factors necessary to meet the MSC Criteria in the same way as the Criteria provide the factors necessary to meet each Principle.

Below each Sub-criterion, individual ‘Performance Indicators’ (PIs) are identified. It is at this level that the performance of the fishery is measured. Altogether, assessment of this fishery against the MSC standard is achieved through measurement of 31 Performance Indicators. The Principles and their supporting Criteria, Sub-criteria and Performance Indicators that have been used by the assessment team to assess this fishery are incorporated into the scoring sheets (**Appendix 3**).

Scoring of the attributes of this fishery against the MSC Ps & Cs involves a three-stage process:

- confirming the relevance of the default assessment tree to the fishery under assessment;
- Agreeing a description and justification of the argument as to why a particular score has been given to each sub-criterion;
- allocation of a score (out of 100) to each sub-criterion.

In order to make the assessment process as clear and transparent as possible, the Scoring Guideposts are presented in the scoring table and describe the level of performance necessary to achieve **100** (represents the level of performance for a performance indicator that would be expected in a theoretically ‘perfect’ fishery), **80** (defines the unconditional pass mark for a performance indicator for that type of fishery), and **60** (defines the minimum, conditional pass mark for each performance indicator for that type of fishery). The Assessment Tree and Scoring Guideposts for the SPSG Atlanto-Scandian herring fishery is shown as **Appendix 3** to this report.

Scoring outcomes

There are two, coupled, scoring requirements that constitute the Marine Stewardship Council’s minimum threshold for a sustainable fishery:

- The fishery must obtain a score of 80 or more for each of the MSC's three Principles, based on the weighted average score for all performance indicators under each Principle; and
- The fishery must obtain a score of 60 or more for each Performance Indicator.

A score below 60 for a Performance Indicator would represent a level of performance that causes the fishery to automatically fail the assessment, unless performance is improved as a pre-condition to certification.

7.2 Scoring

The assessment team convened a scoring meeting on 27th & 28th May 2009. The output of these meetings is shown in the scoring sheets forming **Appendix 3** to this report. The scores allocated to the assessment tree at performance indicator level are shown schematically in **Fig 8**. Typically, where the weighted scores for those performance indicators were below 80 have been allocated – and thus triggering the placing of a condition to bring that element up to good industry practice – would be indicated in **red**, however in the case of the SPSG Atlanto-Scandian fishery all performance indicators met the requisite 80 pass mark.

Fig 8: Summary of the scores for the SPSG Atlanto-Scandian Herring Fishery.

Principle 1 - Stock Status / Harvest Rules			
1.1.1	Outcome	Stock status	100
1.1.2		Reference points	80
1.1.3		Stock rebuilding	n/a
1.2.1	Management	Harvest strategy	90
1.2.2		Harvest control rules & tools	90
1.2.3		Information & monitoring	90
1.2.4		Assessment of stock status	85
Principle 2 - Wider ecosystem impacts			
2.1.1	Retained species	Outcome	95
2.1.2		Management	85
2.1.3		Information	95
2.2.1	Bycatch	Outcome	95
2.2.2		Management	90
2.2.3		Information	80
2.3.1	ETP species	Outcome	85
2.3.2		Management	80
2.3.3		Information	80
2.4.1	Habitats	Outcome	95
2.4.2		Management	95
2.4.3		Information	90
2.5.1	Ecosystem	Outcome	85
2.5.2		Management	90
2.5.3		Information	90
Principle 3 - Management / Governance			
3.1.1	Governance & policy	Legal & customary framework	85
3.1.2		Consultation, roles & resp.	90
3.1.3		Long term objectives	85
3.1.4		Incentives for sustainable fishing	90
3.2.1	Fishery specific management system	Fishery specific objectives	90
3.2.2		Decision making processes	85
3.2.3		Compliance & enforcement	90
3.2.4		Research plan	85
3.2.5		Mgt. performance evaluation	80

8. Certification recommendation

8.1 Overall Scores

The Performance of the SPSG Atlanto-Scandian herring fishery in relation to MSC Principles 1, 2 and 3 is summarised below:

MSC Principle	Fishery Performance
Principle 1: Sustainability of Exploited Stock	Overall : 89 PASS
Principle 2: Maintenance of Ecosystem	Overall : 89 PASS
Principle 3: Effective Management System	Overall : 87 PASS

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any MSC Criteria.

It is therefore recommended that the SPSG Atlanto-Scandian herring fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

Following this recommendation of the assessment team, and review by stakeholders and peer reviewers, a determination is hereby made by the FCI Certification Board to certify this fishery.

8.2 Eligibility Date

An Actual Eligibility Date of 1st February 2010 has been chosen because this date is the expected start of the fishing season for this particular fishery, and could potentially allow the fishery to maximise the amount of product marketed, if successfully certified, under the MSC label.

8.3 Limit of Identification of Landings

Traceability

Although landings are typically into Scottish ports (Lerwick, Fraserburgh, Peterhead), certified vessels may also land into Norway or other EU countries. All landings made to non-UK ports are subject to the same scrutiny and reporting procedures and there is a well established mechanism to enable port-of-landing authorities to report the landing to the relevant UK and Scottish authorities in a timely fashion.

Traceability up to the point of first sale has been scrutinised as part of this assessment and the positive results reflect that the systems in place are deemed adequate to ensure fish is caught in a legal manner and is accurately recorded. The report and assessment tress describe these systems in more detail, but *briefly* traceability can be verified by:

- No transshipment
- A short and geographically restricted fishery enabling concentrated inspection effort.
- Limited species mixing typically enabling a single fishery on a single trip (limited overlap with other fisheries or components).
- Accurate reporting – log books and sales notes (regularly inspected and cross-checked)
- Verified landings data (including data on other retained species) are used for official monitoring of quota up-take and national statistics.
- A high level and sophisticated system of at sea monitoring, control and surveillance, both in EU and Norwegian waters, including routine boarding and inspection, spotter planes, reporting to checkpoints when crossing international boundaries, VMS.

- Close cooperation between Norwegian, UK and EU regulatory and enforcement authorities and no immunity from prosecution in other jurisdictions.
- Reporting prior to landing with limited tolerance
- A high level of inspection of landings prior to unloading. Officially calibrated weighing systems of landing. Routine inspection of entire factory process.

The above is considered sufficient to ensure fish and fish products invoiced as such by the fishery originate from within the evaluated fishery and no specific risk factors have been identified.

At-Sea processing

No at sea processing takes place in this fishery. The extent of the fishery certification is the landing of the fresh, chilled product (RSW on board storage) at ports where registration of landings is carried out and weights registered.

Points of Landing

Vessels may land into the EU and Norway. There are no further restrictions defining port of landing, over and above those stated in national fishing regulations (for example vessels must land to registered ports). There is no requirement for the vessels to land at ports named in this report. There are no specific risk factors after the point of landing which need to be highlighted or that may influence chain of custody assessments.

Eligibility to enter Chain of Custody

Only Atlanto-Scandian herring (*Clupea Harengus*) caught by SPSG member vessels specified in section 2.3 of this report, caught in the manner defined in the Unit of Certification (section 2.2) shall be eligible to enter the chain of custody, and only where fish is landed (first point of sale) to a MSC chain of custody certified business. Fish is typically either sold direct to processing factories or sold through auction arranged by the sales organisation. Chain of Custody should commence following the first point of sale at which point the product shall be eligible to carry the MSC logo. There are no restrictions on the certified product entering further chains of custody. The SPSG does not require its own chain of custody certificate.

8.4 Conditions & Recommendations

The fishery did not obtain any scores of below 80 against any of the Performance Indicators. The assessment team has therefore not set any conditions for continuing certification. However the assessment team have made a small number of recommendations, where scores of 80 or above were obtained, but where there remains potential for meaningful progress towards a higher score.

Typically, as a requirement of certification, the client shall develop an 'Action Plan' for meeting the conditions for continued certification, to be approved by Food Certification International Ltd. In the absence of any conditions, the requirement of the Client Action plan is inevitably reduced, but it may therefore be helpful for the client action plan to address the recommendations, and refer to other recent actions taken elsewhere in the SPSG fleet, as a result of previous MSC certifications for other fisheries.

Recommendations

There is obvious potential for increasing scores – particularly in relation to Principle 2, by improving the information basis on which the assessment is made. With this in mind the assessors recommend:

1. The trip reporting protocols recently developed by the SPSG for use in other fisheries to record interactions with ETP species, and instances of slippage should be extended for use in the Atlanto-Scandian herring fishery. Consult with relevant bodies to ensure all key elements, appropriate to the fishery are included.
2. It would be beneficial to future assessments, if observer reports are provided for the Atlanto-Scandian fishery, giving quantitative corroboration of issues such as ETP species interactions and slippage. This is no more than would be expected for a fishery of this scale and would

further enhance the sustainability credentials of the fishery. SPSG could liaise with Scottish research bodies, to facilitate further involvement in future observer programs or to collaborate in any relevant research, which may require observers.

Inherent in this recommendation is the understanding that SPSG vessel must always accept reasonable requests to place observers on board vessels.

3. The harvest control rule as implemented (i.e. without the 1.5 million tonne cap on the TAC) should be tested through simulation.

It should be noted however, that the above recommendations are not a binding condition of certification, therefore the action taken and timescales are at the discretion of the client.

9. Applicant's agreement to conditions

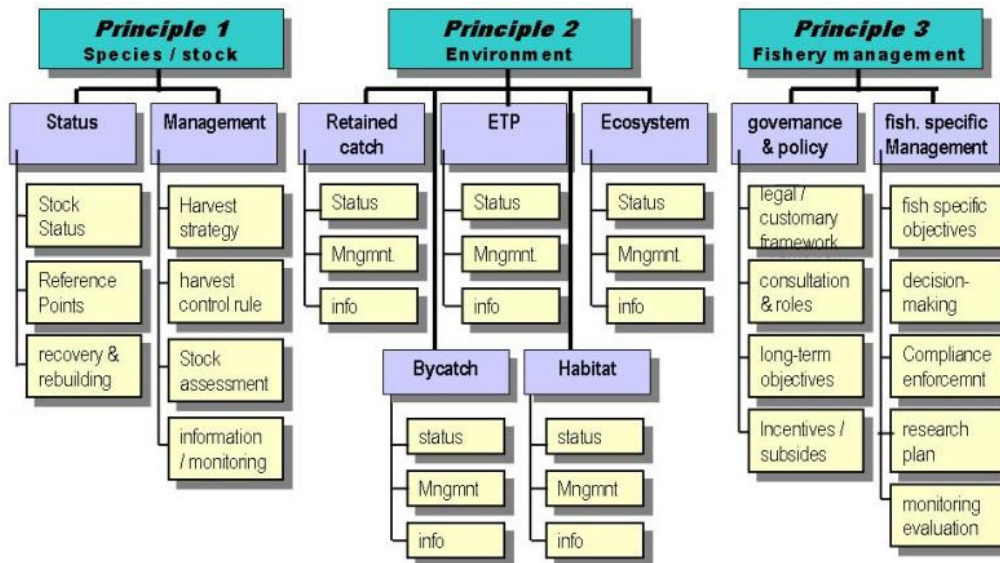
The agreed and signed Action Plan of the Scottish Pelagic Sustainability Group to meet the recommendations of this certification is appended to this report.

10. Amendments made to the Public Review Report following the 30 day consultation period

During the 30 day consultation period for the Draft Public Review Report no stakeholder comments were received, however, a small number of amendments have been made to this Final Report, they are:

1. A summary section has been added on page 3 of the Final Report.
2. Additional detail has been provided under Section 8.3 - Limit of Identification of Landings relating to traceability – see page 41.

Appendix 1 – MSC Ps & Cs



Below is a much-simplified summary of the MSC Principles and Criteria, to be used for over-view purposes only. For a fuller description, including scoring guideposts under each performance indicator, reference should be made to the full assessment tree, complete with scores and justification, contained in annex 3 of this report. Alternately a fuller description of the MSC Principles and Criteria can be obtained from the MSC website (www.msc.org).

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short-term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Outcomes

- The stock is at a level that maintains high productivity and has a low probability of recruitment overfishing.
- Limit and target reference points are appropriate for the stock (or some measure or surrogate with similar intent or outcome).
- Where the stock is depleted, there is evidence of stock rebuilding and rebuilding strategies are in place with reasonable expectation that they will succeed.

Harvest strategy / management

- There is a robust and precautionary harvest strategy in place, which is responsive to the state of the stock and is designed to achieve stock management objectives.
- There are well defined and effective harvest control rules in place that endeavour to maintain stocks at target levels.

- Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.
- The stock assessment is appropriate for the stock and for the harvest control rule, takes into account uncertainty, and is evaluating stock status relative to reference points.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends

Intent:

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Retained species / Bycatch / ETP species

- Main species are highly likely to be within biologically based limits or if outside the limits there is a full strategy of demonstrably effective management measures.
- There is a strategy in place for managing these species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.
- Information is sufficient to quantitatively estimate outcome status and support a full strategy to manage main retained / bycatch and ETP species.

Habitat & Ecosystem

- The fishery does not cause serious or irreversible harm to habitat or ecosystem structure and function, considered on a regional or bioregional basis.
- There is a strategy and measures in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.
- The nature, distribution and vulnerability of all main habitat types and ecosystem functions in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

Governance and policy

- The management system exists within an appropriate and effective legal and/or customary framework that is capable of delivering sustainable fisheries and observes the legal & customary rights of people and incorporates an appropriate dispute resolution framework.
- Functions, roles and responsibilities of organizations and individuals involved in the management process are explicitly defined and well understood. The management system includes consultation processes.
- The management policy has clear long-term objectives, incorporates the precautionary approach and does not operate with subsidies that contribute to unsustainable fishing.

Fishery specific management system

- Short and long term objectives are explicit within the fishery's management system.
- Decision-making processes respond to relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner.
- A monitoring, control and surveillance system has been implemented. Sanctions to deal with non-compliance exist and there is no evidence of systematic non-compliance.
- A research plan provides the management system with reliable and timely information and results are disseminated to all interested parties in a timely fashion.

Appendix 2 – References

COUNCIL REGULATION (EC) No 812/2004 of 26 April 2004 laying down measures concerning incidental catches of cetaceans in fisheries and amending Regulation (EC) No 88/98

DEFRA (2009). UK Small Cetacean Bycatch Strategy
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ICES Advice (2008). 9.4.2. North East Atlantic Mackerel (Combined Southern, Western and North Sea Spawning components). ICES Advice 2008, Book 9 pp 74 – 91.

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WKREF (2007) Report of the Workshop on Limit and Target Reference Points. ICES WKREF Report 2007. 29 January – 2 February 2007, Gdynia, Poland. ICES CM 2007/ACFM:05. <http://www.ices.dk/reports/ACOM/2007/WKREF/WKREF07.pdf>

SCORING INDICATORS	Comments	References	Score
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Appendix 3 – Assessment Tree / Scoring sheets

The following Assessment Tree includes description of the scoring guideposts (SGs) and performance indicators (PIs) used to score the fishery. The Assessment tree provides detailed justification for all scores attributed to the fishery, in a way which is clearly auditable by future assessors

NAME OF FISHERY	SPSG Atlanto-Scandian Herring		
Principle 1	A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.		

1.1	Outcomes		
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1.1.1	Stock status	The stock is at a level that maintains high productivity and has a low probability of recruitment overfishing.		100
60	It is <u>likely</u> that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired. The maximum catch of 1 266 000t taken in 2008 is expected to leave a spawning stock of 12.2 million tonnes in 2009 – well above the point where recruitment would be impaired. There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years. There is a high degree of certainty that the stock has been above its target reference point, of 5 million tonnes over recent years. The biomass has been above the trigger point and within the target region since 2002.	WGWISE (2008) ICES Advice (2008)	
80	It is <u>highly likely</u> that the stock is above the point where recruitment would be impaired. The stock is at or fluctuating around its target reference point.			
100	There is a <u>high degree of certainty</u> that the stock is above the point where recruitment would be impaired. There is a <u>high degree of certainty</u> that the stock has been fluctuating around its target reference point, or has been above its target reference point, <u>over recent years</u> .			

1.1.2	Reference points	Limit and target reference points are appropriate for the stock.		80
60	<u>Generic</u> limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated. There are reasonable estimates of SSB and fishing mortality, with a time series extending back to the 1970s. The time series includes an extended period of depletion which gives greater confidence in the reference point estimates. However, the technical basis for the reference points are unclear and estimates are very imprecise. Recent attempts to improve the reference points confirm that they are at the right general level, but have	WGWISE (2008) ICES Advice (2008) WKREF (2007)	
80	Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome. For low trophic level species, the target reference point takes into account the ecological role of the stock.			

SCORING INDICATORS		Comments	References	Score
100	Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant <u>precautionary issues</u> . The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome, <u>or a higher level</u> , and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.	<p>been unable to improve their precision.</p> <p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. Given the history of the fishery, reference points can be seen to be precautionary and should maintain the stock well above the level of depletion which occurred during the 1970s and 1980s.</p> <p>The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome. The precise technical basis for the target reference point is unclear, but the choice is a low value tested through medium term projections. In the long term and subject to environmental fluctuations, it should maintain the biomass within the target region. The precise relation between the reference points and MSY is not clear, but the current reference points have the same intent.</p> <p>The target reference point takes into account the ecological role of the stock. The current target fishing mortality is set low, and by general consent should allow significant biomass of herring for its role as predator and prey.</p> <p>However, reference points have been estimated with low precision and lack a strong theoretical basis allowing determination of issues such as how precautionary they are and where they lie in relation to MSY. Recent attempts by Workshop on Limit and Target Reference Points (WKREF) 2007 failed to improve estimates due to problems with the analyses being applied. The imprecision and poor technical basis for the reference points prevents them meeting any of the additional PIs for the 100 guidepost.</p>		
1.1.3	Stock recovery	Where the stock is depleted, there is evidence of stock rebuilding.		
60	Where stocks are depleted rebuilding strategies which have a <u>reasonable expectation</u> of success are in place. Monitoring is in place to determine whether they are effective in rebuilding the stock within a <u>specified timeframe</u> .	The stock biomass is above Bpa, so the stock is not depleted and this PI does not apply.		
80	Where stocks are depleted rebuilding strategies are in place. There is <u>evidence</u> that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a <u>specified timeframe</u> .			
100	Where stocks are depleted, strategies are <u>demonstrated</u> to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the <u>shortest practicable timeframe</u> .			

SCORING INDICATORS		Comments	References	Score
1.2		Harvest strategy / management		
1.2.1	Harvest strategy	There is a robust and precautionary harvest strategy in place.		90
60	The harvest strategy is <u>expected</u> to achieve stock management objectives reflected in the target and limit reference points. The harvest strategy is <u>likely</u> to work based on prior experience or plausible argument. <u>Monitoring</u> is in place that is expected to determine whether the harvest strategy is working.	<p>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together in a way which is <u>designed</u> to achieve stock management objectives reflected in the target and limit reference points. The primary control is the TAC which is implemented and enforced by the parties to the agreement. The TAC is being set consistent with the harvest control rule and enforcement appears good and control is adequate. An annual stock assessment is conducted to provide management advice and output from the assessment is used to set the TAC. Hence, there is clear feedback and control through TAC implementation and enforcement.</p> <p>The performance of the harvest strategy has been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels. There are fishery independent surveys giving independent feedback on the management actions and provide independent estimates on stock status. Medium term projections are conducted as part of the stock assessment. While the stock was depleted in the past, there is clear evidence that it has been rebuilt suggesting that, subject to environmental change, the current precautionary strategy should be able to maintain biomass at the target levels.</p> <p>The harvest strategy is <u>periodically reviewed and improved</u> as necessary. Review forms part of the management plan. The plan has been evaluated and ICES agrees it is precautionary. The plan has not been updated since 1999. Independent information is also gathered on environmental effects and research is being conducted which should allow adaptation of the harvest strategy should this become necessary.</p> <p>However, the harvest strategy does have gaps and has not been implemented consistently through the years. Although the Parties have recently agreed a TAC, agreement has not always been reached in the past, although this has not led to any breakdown in control and the overall catch has not exceeded the target, at least so far. There is no information on discarding or other unrecorded mortality. The working group indicates that this should be negligible, but lack quantitative data to back this up. Discarding or slippage may result from the minimum size regulation.</p>	WGWIDE (2008) ICES Advice (2008)	
80	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work together</u> towards achieving management objectives reflected in the target and limit reference points. The harvest strategy may not have been fully tested but monitoring is in place and <u>evidence exists</u> that it is achieving its objectives.			
100	The harvest strategy is responsive to the state of the stock and is <u>designed</u> to achieve stock management objectives reflected in the target and limit reference points. The performance of the harvest strategy has been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels. The harvest strategy is <u>periodically reviewed and improved</u> as necessary.			

SCORING INDICATORS		Comments	References	Score
1.2.2	Harvest control rule(s) & tools	There are well defined and effective harvest control rules in place.		90
60	Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. There is <u>some evidence</u> that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The harvest control rules are published and designed specifically to meet the objectives based on the reference points. However, fishing mortality is not set to zero below Blim, which would be considered more precautionary.	WGWIDE (2008) ICES Advice (2008)	
80	<u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The <u>selection</u> of the harvest control rules takes into account the <u>main</u> uncertainties. <u>Available evidence indicates</u> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	The design of the harvest control rules take into account main uncertainties. The evaluations of the stock take into account environmental effects and migration which are considered the main sources of uncertainty for this stock. However, these are not explicitly taken into account in the harvest control rule. For example, the target fishing mortality is lower than the precautionary level, but no technical reason is given for the actual value used and therefore how precautionary it is, is not clear. Bootstrap and retrospective analyses were used to examine uncertainties, but no full management strategy evaluation has been undertaken. The evaluation of the management plan applied a catch ceiling which is not applied in practice and could be exceeded.		
100	<u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The <u>design</u> of the harvest control rules take into account a <u>wide</u> range of uncertainties. <u>Evidence clearly shows</u> that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules. Monitoring data and the annual stock assessments show that the targets in terms of catches, fishing mortality and biomass are being met. However, the harvest control rule should be tested as it is actually applied. The harvest control rule has been tested assuming that the TAC will not exceed 1.5 million tonnes. The TAC has exceeded 1.5 million tonnes (by less than 10%) in 2008 and 2009. If the actual implementation departs further or continues to depart from the tested harvest control rule, the score on this PI could fall as the evidence weakens for effectiveness is weakened.		

SCORING INDICATORS		Comments	References	Score
1.2.3	Information / monitoring	Relevant information is collected to support the harvest strategy.		90
60	<u>Some</u> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy. Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	There is a comprehensive range of information on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and environmental information. Not all information is directly relevant to the current harvest strategy, but is available. Environmental information is used for interpreting the monitoring data and providing a better indication of uncertainty.	WGWISE (2008) ICES Advice (2008)	
80	<u>Sufficient</u> relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy. Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule. There is good information on all other fishery removals from the stock.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent uncertainties in the information and the robustness of the assessment and management to this uncertainty.		
100	A <u>comprehensive range</u> of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available. <u>All information</u> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent <u>uncertainties</u> in the information [data] and the robustness of the assessment and management to this uncertainty.	<p>There are a number of measures of stock abundance, including a recruitment index, which is obtained annually. The main problem with the surveys has been the changes in stock location. While this has increased uncertainty in the interpretation of data and rendered some surveys ineffective, the abundance surveys remain comprehensive enough to monitor stock abundance accurately.</p> <p>Catches are well recorded and the catch and survey sampling of age and weight is sufficient. However, discarding (slippage) and misreporting are thought to occur, but are unrecorded. The working group believes this unrecorded mortality is negligible.</p> <p>The principle weakness of the monitoring programme in place for this fishery is the limited scientific observer coverage of the fishery as a whole, and in the context of this assessment the activities of the Scottish fleet when active in the Atlanto-scandian fishery. This latter state of affairs is primarily a reflection of the limited Scottish involvement in this fishery.</p>		

SCORING INDICATORS	Comments	References	Score
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1.2.4	Stock assessment	There is an adequate assessment of the stock status.		85
60	The stock assessment estimates stock status relative to reference points. The major sources of uncertainty are identified.	<p>The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points. The final age structured model was able to estimate spawning stock biomass and average fishing mortality. The various parameters used in the model are estimated for the species and this stock. Various aspects of the environmental effects on the stock (e.g. distribution) are not accounted for in the model, although considerable effort has been placed in rendering the input information robust to such effects.</p> <p>The assessment takes uncertainty into account. The VPA method is not fully probabilistic, but a robust bootstrap method is applied to estimate uncertainty in values of interest. The bootstrap should account for observation error. A retrospective analysis was used to assess model structure error, but the observed bias was not addressed, albeit it was in a precautionary direction (negative bias for SSB and positive bias for F). As far as these tests of the assessment go, they show it to be reasonably robust. The stock status is not evaluated in a probabilistic way.</p> <p>The stock assessment is subject to internal peer review through the working group process. An external review has not been undertaken.</p> <p>Some alternative hypotheses and assessment approaches have been explored using a variety of software. The models are different flavours of the same basic VPA approach, but a model specific to this population has not been developed and not all alternative hypotheses and assessment approaches have been rigorously explored.</p> <p>There is no stock recruitment relationship established primarily due to problems with the method being applied to estimate the S/R function. Without a stock-recruitment relationship at least as a hypothesis, it will be difficult to develop the assessment method further.</p>	WGWISE (2008) ICES Advice (2008)	
80	The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points. The assessment takes uncertainty into account. The stock assessment is subject to peer review.			
100	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery. The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way. The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. The assessment has been <u>internally and externally</u> peer reviewed.			

SCORING INDICATORS	Comments	References	Score
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Principle 2	Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends		
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2.1	Retained species		
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2.1.1	Outcome Status	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.		
60	Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery	Data obtained for the 2008 and 2009 fishery from Marine Scotland (Compliance) (formerly SFPA) indicates that this is a very clean fishery with very limited other species landed other than the target species. In 2008 there was less than 0.5% bycatch and in the 2009 fishery zero bycatch. In the 2008 fishery the bycatch was of blue whiting (69t) and mackerel (4t). In both cases the amounts caught were trivial when considered in the context of the TACs for both species. All retained species are landed and recorded in full, and taken off the relevant quota allocation.	Marine Scotland (Compliance) <i>pers comms.</i> ICES WGWIDE 2008	95
80	Main retained species are <u>highly likely</u> to be within biologically based limits or if outside the limits there is a <u>partial strategy of demonstrably effective</u> management measures are in place such that the fishery does not hinder recovery and rebuilding.	Based on the figures from 2008 and 2009 it is therefore possible to score all retained species (not just main) – regardless of volume, value or vulnerability. Both mackerel and Blue whiting meet the 80 guideposts and in addition mackerel meets the 100 guideposts. Because of the accuracy of figures on retained catch and the clean nature of the fishery, and the fact that blue whiting reference points are defined but not yet implemented, a further 5 points is awarded.		
100	There is a <u>high degree of certainty</u> that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.	For Blue whiting there is a <u>high degree of certainty</u> that stocks are within biologically based limits (well above Bpa in spite of a high fishing mortality which is currently under negotiation as part of management plan development). Existing management at least represents a <u>partial strategy of demonstrably effective</u> management measures. For mackerel there is also a <u>high degree of certainty that the stock is within biologically based limits</u> . Target reference points are defined and mackerel is fluctuating around the target reference points.		

SCORING INDICATORS		Comments	References	Score
2.1.2	Management strategy	There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.		
60	There are <u>measures</u> in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biological based limits, or to ensure the fishery does not hinder their recovery and rebuilding. The measures are considered <u>likely</u> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is a strategy in place to reduce capture of non-target retained species. The SPSP vessels targeting Atlanto-Scandian herring, seek to maximise the value of their relatively small quota allocation by fishing at a time of year when the best price can be achieved and when it is possible to capture their allocation cleanly – with few or no other species retained. There is a commercial incentive to land clean hauls with no other retained species as any mixing reduces the price that the vessels obtain for landings. This strategy of seeking zero non-target species is informed by prior experience in the fishery and intelligence derived from Norwegian skippers, supported by bridge technology which has greatly enhanced skipper's ability to differentiate between clean and mixed hauls. As a result, evidence (data from Marine Scotland (Compliance)) suggests that this is a clean fishery and therefore the strategy is working. Furthermore, all landings of non-target species are retained and recorded against relevant quota. SPSP sustainability policy also states that constant effort will be made to reduce bycatch (including retained non-target species) to ecologically insignificant levels. This already appears to be the case in this fishery.	ICES WGwide 2008 SPSP <i>pers</i> <i>comms</i> . Marine Scotland (Compliance) <i>pers</i> <i>comms</i> .	85
80	There is a <u>partial strategy</u> in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding. There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or species involved. There is <u>some evidence</u> that the partial strategy is being <u>implemented successfully</u> .	In terms of the management strategy for those non-target species caught in the fishery, both blue whiting and mackerel are quota species, therefore subject to rigorous assessment and MCS. For mackerel a full management plan has been evaluated by ICES as precautionary, whereas for Blue Whiting, although a management plan has been proposed this is yet to be ratified. For both species there is clear evidence to suggest that the strategies are achieving the overall objective of maintaining stock levels above Bpa.		
100	There is a <u>strategy</u> in place for managing retained species. The strategy is mainly based on information directly about the fishery and/or species involved, and <u>testing</u> supports <u>high confidence</u> that the strategy will work. There is <u>clear evidence</u> that the strategy is being <u>implemented successfully</u> , and intended changes are occurring. There is some evidence that the strategy is <u>achieving its overall objective</u> .			

SCORING INDICATORS		Comments	References	Score
2.1.3	Information monitoring	Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.		
60	<p>Qualitative information is available on the amount of main retained species taken by the fishery.</p> <p>Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits.</p> <p>Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.</p>	<p>All retained species landed and recorded in full in both log books and sales notes and taken from quota of those species. Sales and landings figures cross checked and in this fishery 100% of all landings are monitored. Information is therefore readily available from Marine Scotland (Compliance) which is accurate and verifiable, enabling the consequences for the status of affected populations to be determined and this is deemed <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of certainty</u>. Any removals are considered in the management of other affected fisheries. There are no indications that figures are not accurate. Assessors were not able to take a wider view of the impact of the entire fishery on other retained species as this landings information is not coordinated across all countries.</p>	Marine Scotland (Compliance <i>pers comms</i>)	95
80	<p>Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.</p> <p>Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits.</p> <p>Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p>			
100	<p>Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.</p> <p>Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of certainty</u>.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective.</p> <p>Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.</p>			

SCORING INDICATORS		Comments	References	Score
2.2		Bycatch		
2.2.1	Outcome Status	The fishery does not pose a risk of serious or reversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.		
60	Main bycatch species are <u>likely</u> to be within biologically based limits, or if outside such limits there are mitigation <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding. If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.	The only possible source of bycatch in the SPSP ASH fishery is as a result of slippage. No on-board sorting or grading is permitted therefore there is no bycatch once fish have been pumped from the net. There is no evidence of slippage in this fishery and slippage is illegal in Norwegian waters, where this fishery takes place, by contrast to EU waters where slippage is still permitted (although the January 2010 EU control regulation has significantly tightened this area of operation). In addition the SPSP vessels seek to maximise the value of their quota allocation by targetting the fishery at peak season when shoals are densely aggregated with little mixing. Additionally, there is also less price variation with size compared to other species (notably mackerel), which adds to the reasoned justification that slippage is a minor problem in the SPSP targetting of this fishery compared to some other pelagic fisheries. Where small quantities of non-target species are captured, all indications are that they are landed (and dealt with under 2.1 – Retained species), rather than being slipped. If a haul was slipped as a result of high levels of bycatch it would most likely be due to the same species as retained, so outcome status scored the same.	WGWISE 2008 Arl Slotte (IMR) <i>pers</i> <i>comms</i> .	95
80	Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.			
100	There is a <u>high degree of certainty</u> that bycatch species are within biologically based limits.	A score of 100 could in theory be awarded on the basis of the above rationale, however 5 points have been deducted due to the less than ideal level of independent verification.		

SCORING INDICATORS		Comments	References	Score
2.2.2	Management strategy	There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations.		
60	There are <u>measures</u> in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery. The measures are considered <u>likely</u> to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is a strategy in place for managing and minimising bycatch. On-board grading and sorting of bycatch is banned and in Norwegian waters (where this fishery occurs) slippage is also banned, and this is tightly enforced with a high likelihood of detection. Furthermore, Scottish vessels also seek to take their small quota allowance with maximum efficiency, meaning that they make use of Norwegians intelligence on geography and timing.	SPSG Sustainability Policy Marine Scotland (pers comms.) ICES Advice 2008, 9.4.4 (Blue Whiting) & 9.4.2 (NEA Mackerel). Norwegian Directorate of Fisheries 2008 Aril Slotte pers comms.	90
80	There is a <u>partial strategy</u> in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery. There <u>is some objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or the species involved. There is <u>some evidence</u> that the partial strategy is being implemented successfully.	The SPSG have a clear sustainability policy which includes consideration of bycatch. This states that "The Scottish pelagic industry does not and will not condone..... slippage or high grading (and this) contradicts the whole spirit of the sustainable policy under which the industry operates". Any species which theoretically could be slipped, have either full (mackerel) or partial (Blue whiting) management regimes in place. There is therefore a high confidence that these combined strategies will work.		
100	There is a <u>strategy</u> in place for managing and minimising bycatch. The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports <u>high confidence</u> that the strategy will work. There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.	All of the 80 scoring guideposts are met along with the first 100 scoring guidepost (strategy). For the 2 nd 100 guidepost, although there is a high level of confidence this has not been tested. For the 3 rd scoring guidepost (evidence) although there is clear evidence of implementation there is less available evidence that it is achieving its aim. If more independent observer reports were available of the strategy in action and more independent scientific work was carried out to quantitatively evaluate the performance of this traatetgy then a score of 100 would have been awarded.		

SCORING INDICATORS		Comments	References	Score
2.2.3	Information / monitoring	Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.		
60	<p><u>Qualitative information</u> is available on the amount of main bycatch species affected by the fishery.</p> <p>Information is <u>adequate to broadly understand</u> outcome status with respect to biologically based limits.</p> <p>Information is adequate to support <u>measures</u> to manage bycatch.</p>	<p>Although all qualitative information, informed opinion and reasoned justification suggests that the scale of slippage is low in this fishery, there is only limited information to confirm this, from a low level of observer coverage (including by other national fisheries that target ASH). The available quantitative information therefore falls short of being accurate and justifiable. However, the existing intelligence and information is sufficient estimate outcome status with respect to biologically based limits, with any impact likely to be trivial in relation to targeted catches. Given the scale of the issue existing information is also sufficient to support a partial strategy for main bycatch species. It is unclear how any increase in slippage or discarding would be observed – other than routine monitoring by the Norwegian coast guard and observer work in the Norwegian fishery or other nationalities fisheries. However, any such change in behaviour would likely apply across the international fleet and be captured in the work of international scientists on the ICES working group – triggering management action if necessary. Therefore given the applicability of international data presented to the ICES working group and the small scale of the potential problem it can reasonably be concluded that sufficient data continue to be collected to detect any increase in risk.</p>	<p>SPSG Pers comms. Marine Scotland (Compliance <i>pers comms</i>) Norwegian Fisheries Directorate (<i>pers comms</i>) Arl Slotte (IMR) <i>pers comms</i> Craig Davis (Marine Scotland – Science) <i>pers comms</i>.</p>	80
80	<p><u>Qualitative information and some quantitative information are</u> available on the amount of main bycatch species affected by the fishery.</p> <p>Information is sufficient to estimate outcome status with respect to biologically based limits.</p> <p>Information is adequate to support a <u>partial strategy</u> to manage main bycatch species.</p> <p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p>			
100	<p><u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.</p> <p>Information is <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u>.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.</p> <p>Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.</p>			

SCORING INDICATORS	Comments	References	Score
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2.3	ETP species		
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2.3.1	Status	The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.		
60	Known effects of the fishery are <u>likely</u> to be within limits of national and international requirements for protection of ETP species. Known direct effects are <u>unlikely</u> to create <u>unacceptable impacts</u> to ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species. Environmental groups and relevant research units (SMRU) have indicated that this is unlikely to be a problem and therefore fully compliant with international conventions. However, without more information (for example from extended observer coverage in <i>this</i> fishery) it is not possible to draw conclusions with a high degree of certainty (as required for a 100 score). In 2004 a Greenpeace report (Ross and Isaacs, 2004) considered published and anecdotal information. Within the North East Atlantic the report identified mackerel and horse mackerel pelagic trawling southwest of Ireland as a fishery where cetacean bycatch could be documented and the number of animals caught was reported as being low.	SMRU <i>Pers comms.</i> Ross & Isaacs 2004 ICES 2008 Book 3 – Barents & Norwegian Sea ICES 2008 Book 6 – North Sea Reid <i>et al</i> 2003	85
80	The effects of the fishery are known and are <u>highly likely</u> to be within limits of national and international requirements for protection of ETP species. Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	The Sea Mammal Research Unit has also undertaken an extensive observer programme and there is a good history of cooperation with this programme by Scottish SPSPG vessels. The observer programme has shown that there is no evidence of any interaction with protected, endangered or threatened species. There is good understanding of the presence and status of the key ETP species in the area of the fishery. Key species include a wide range of cetaceans including Common dolphin, Bottlenose dolphin, Atlantic White-sided dolphin and Minke whale. The Minke whale (<i>Balaenoptera acutorostrata</i>) is abundant in the Norwegian sea where this fishery occurs and is known to follow migrations of herring. Two species of seal are known from these waters also – Common or Harbour seal <i>Phoca vitulina</i> and Gray Seal <i>Halichoerus grypus</i> . Other ETP species recorded in the north-eastern Atlantic include Basking shark <i>Cetorhinus maximus</i> and Atlantic Bluefin tuna <i>Thunnus thynnus</i> . Indirect effects may include impacts from pollution, lost gear, waste materials jettisoned overboard. The potential scale of these impacts have been considered and concluded to be highly unlikely to create unacceptable impacts. All the SPSPG vessels have strict onboard procedures for waste and pollution (all vessels are fully MARPOL compliant and strictly licensed and inspected in these areas).		
100	There is a <u>high degree of certainty</u> that the effects of the fishery are within limits of national and international requirements for protection of ETP species. There is a high degree of confidence that there are no significant detrimental effects (direct and indirect) of the fishery on ETP species.	All of the 80 scoring guideposts are met. In addition, the work by the Sea Mammal Research Unit with the SPSPG fleet provides confidence that there are no significant detrimental effects – partially meeting the 2 nd 100 scoring guidepost, and on this basis an additional 5 points are awarded. More continuously collected quantitative data would be required before conclusions could be drawn with a high degree of certainty.		

SCORING INDICATORS		Comments	References	Score
2.3.2	Management strategy	<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> - meet national and international requirements; - ensure the fishery does not pose a risk of serious or irreversible harm to ETP species; - ensure the fishery does not hinder recovery of ETP species; and - minimise mortality of, or injuries to, ETP species. 		
60	<p>There are <u>measures</u> in place that minimise mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species..</p> <p>The measures are <u>considered likely</u> to work, based on <u>plausible argument</u> (eg general experience, theory or comparison with similar fisheries/species).</p>	<p>Both the UK and Norway are members of CITES, and the UK is also a signatory to ASCOBANS.</p> <p>The UK Government (DEFRA) has been pro-active in seeking to identify and limit the causes of cetacean bycatch in fisheries and have commissioned the Sea Mammal Research Unit (SMRU) to monitor UK fisheries which may be responsible for causing cetacean by-catch and to develop mitigation measures to reduce the bycatch of marine mammals. SMRU's work has included extensive coverage of the Scottish pelagic fleet – sufficient to identify the priority areas, seasons and fisheries.</p>	EC 812/2004 DEFRA 2009	80
80	<p>There is a <u>strategy</u> in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>There is an <u>objective basis for confidence</u> that the strategy will work, based on <u>some information</u> directly about the fishery and/or the species involved.</p> <p>There is <u>evidence</u> that the strategy is being implemented successfully.</p>	<p>European Council Regulation (EC) 812/2004 lays down measures concerning incidental catches of cetaceans in fisheries (by-catch) and provides timescales for measures in specific priority fisheries. This mainly focuses on fixed gear fisheries (gillnets) but there is also a requirement for observers on pelagic trawl vessels, however only for operations in ICES areas VI, VII, VIII (i.e. – West Scotland to the Bay of Biscay), and well away from the Atlanto-Scandian fishery described in this report.</p>		
100	<p>There is a <u>comprehensive strategy</u> in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to achieve <u>above</u> national and international requirements for the protection of ETP species.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and a <u>quantitative analysis</u> supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is evidence that the strategy is achieving its objective.</p>	<p>Although most of the information available is derived from wider studies of pelagic fisheries in general, rather than the specific fishery (ie SPSP targetting ASH). There is objective basis for confidence that the strategy in place for limiting this fisheries impact on ETP species is highly likely to achieve national and international requirements</p>		

SCORING INDICATORS		Comments	References	Score
2.3.3	Information / monitoring	<p>Relevant information is collected to support the management of fishery impacts on ETP species, including:</p> <ul style="list-style-type: none"> - information for the development the management strategy; - information to assess the effectiveness of the management strategy; and - information to determine the outcome status of ETP species. 		
60	Information is <u>adequate</u> to <u>broadly understand</u> the impact of the fishery on ETP species. Information is adequate to support <u>measures</u> to manage the impacts on ETP species. Information is sufficient to quantitatively estimate the fishery related mortality of ETP species.	<p>There is a good level of information of ETP presence and distribution in areas of fishery, for example in ICES ecosystem descriptions of the North Sea and Norwegian Sea ecosystem and in specific projects such as SCANSII and publications such as the Atlas of Cetacean distribution in north-west European waters (Reid <i>et al</i> 2003). The presence of VMS on all the vessels covered in this assessment also means there is excellent positional information for fishing activity, which enables the theoretical overlap of the fishery with key ETP species to be established.</p> <p>In addition there is good information on fishery interactions, coordinated through SMRU with specific coverage of the Scottish pelagic fleet – and although not specific to the fishery, this is likely to be applicable. Above all, the existing information has identified the fishery as low risk, therefore level of coverage likely to be adequate and provide sufficient data – rather than being accurate and justifiable.</p>	ICES 2008 Book 3 – Barents & Norwegian Sea ICES 2008 Book 6 – North Sea Reid <i>et al</i> 2003	80
80	Information is <u>sufficient</u> to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a <u>full strategy</u> to manage impacts. <u>Sufficient data</u> are available to allow fishery related mortality and the impact of fishing to be <u>quantitatively</u> estimated for ETP species.			
100	Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a high degree of certainty. Information is adequate to support a <u>comprehensive strategy</u> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. <u>Accurate and verifiable information</u> is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.			

SCORING INDICATORS		Comments	References	Score
2.4	Habitat			
2.4.1	Status	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function, in relation to ecosystem services.		
60	The fishery is <u>unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. Pelagic trawling does not have any impact on the pelagic environment.	FAO Gear Type Fact Sheet Fossa <i>et al</i> 2005 ICES 2008 Book 3 – Barents & Norwegian Sea ICES 2008 Book 6 – North Sea	95
80	The fishery is <u>highly unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.			
100	There is <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	<p>Atlanto-scandian herring are a pelagic fish species meaning that they are most abundant in areas of open ocean, where they tend to aggregate in large three-dimensional shoals above the seabed. Herring are therefore most efficiently caught using mid-water trawls, which are used to fish in the water column and there is no requirement for fishing gear to make contact the seabed in order to catch fish. It is well known that even momentary encounters with the seabed can cause extensive damage to pelagic trawls. Large clump weights (up to 3 tonnes) may be used to submerge a pelagic trawl and to prevent the net rising as the net is towed at speeds of up to 5 knots. Weights are suspended forward of the net on the towing bridle and can be raised and lowered using the trawl winch. Weights do not intentionally contact the seabed during fishing.</p> <p>A score of 100 could be achieved if results of a system to record unexpected seabed interactions were available during future MSC audits.</p>		

SCORING INDICATORS		Comments	References	Score
2.4.2	Management strategy	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.		
60	<p>There are <u>measures</u> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a strategy in place that is designed to achieve the habitat outcome 80 level of performance or above. The strategy is based on some information directly about the fishery and/or habitats involved, and there is some objective basis for confidence that the strategy will work. There is some evidence that the strategy is being implemented successfully (e.g. the measures in the strategy are being followed and any intended changes are occurring).</p>	<p>FAO Gear Type Fact Sheet SPSG Pers comms.</p>	95
80	<p>There is a <u>partial strategy</u> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</p> <p>There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being implemented successfully.</p>	<p>Measures to minimise seabed/ fishing gear interactions are in place across the fleet and include the use of sophisticated electronics, including depth sounders, sonars and trawl monitoring systems. Scanning sonars on all vessels reveal seabed depth and topography for up to 1.5 miles ahead of the vessels, meaning that there is sufficient advance warning of changes in depth or seabed obstructions to allow altering of course or raising of gear. Rapid changes to the depth of the net can be made directly from the wheelhouse via the winches. All vessels use trawl-monitoring sensors. Sensors are attached to the net and wheelhouse monitors display data in relation to the spread and height of the net opening, depth of the footrope of the net and the clearance between the footrope and the seabed.</p>		
100	<p>There is a <u>strategy</u> in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>	<p>In addition, Norway has undertaken a number of substantial habitat mapping exercises to inform management strategy in the area of this fishery. For example, the Institute of Marine Research commenced a program for mapping and assessment of <i>Lophelia</i> reefs in 1997. This has provided an extensive database of coral occurrences, both damaged and undamaged sites and enables potential coral areas to be identified by analysing seafloor topography on maps. This has been used to inform the establishment of MPAs at a number of key coral habitats.</p> <p>A score of 100 could be achieved if results of a system to record fishing gear/seabed interactions were available during future MSC audits.</p>		

SCORING INDICATORS		Comments	References	Score
2.4.3	Information / monitoring	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.		
60	There is a basic understanding of the types and distribution of main habitats in the area of the fishery. Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.	<p>There is sufficient level of understanding of the main habitat types (relevant to the scale and intensity of the fishery) in the area of the fishery. The Norwegian Institute of Marine Research has undertaken extensive habitat mapping exercises (MAREANO Project), and the ICES ecosystem descriptions for the North Sea and Norwegian Sea are also relevant. Any changes in habitat over time are likely to be picked up. Additionally, there is excellent positional information for fishing activity.</p> <p>Although contact with seabed (if and where this occurs) is not recorded in any verifiable way, the scale of any potential problem is small, therefore low risk, therefore level of monitoring likely to be appropriate.</p>	<p>Fossa <i>et al</i> 2005 ICES 2008 Book 3 – Barents & Norwegian Sea ICES 2008 Book 6 – North Sea</p>	90
80	The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery. Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear. Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).			
100	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types. Changes in habitat distributions over time are measured. The physical impacts of the gear on the habitat types have been quantified fully.			

SCORING INDICATORS	Comments	References	Score
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2.5	Ecosystem		
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2.5.1	Status	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
60	The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	<p>There is a good evidence base for understanding the status of the ecosystem in the Southern Norwegian Sea, and Northern North Sea, where this fishery takes place. This evidence indicates that the fishery is highly unlikely to disrupt key elements of the ecosystem. The stock of herring is in a very good shape, whereas mackerel and blue whiting, which partly use the Norwegian Sea as a feeding area, are both probably close to the precautionary limit. There is altogether more than 12 million tonnes of pelagic fish migrating through the area, feeding there through the summer. The high biomass of plankton feeding fish may explain the past years' decreasing trend in zooplankton biomass.</p> <p>The key interaction with the ecosystem is the removal of the target species, which serves as a prey species for a wide range of fish, birds and marine mammals. The potential effects of this is constantly reviewed by multi-species virtual population analysis (MSVPA) associated with the ICES year of the stomach 1981, 1991 although there is some way to go before any of these studies can be viewed as accurately describing the ecosystem in full. There have been no indications that the current harvest management plan and recent fishery removals have posed an unacceptable risk to herring predator or prey populations. Further understanding of the role of target species in wider ecosystem balance is provided by reference to periods of low SSB (1970s).</p> <p>There is also a potential for an impact on planktonic macro fauna – jellyfish. There is also an increasing understanding of role of environmental factors, such as climate change in ecosystem balance.</p>	<p>Sissener & Bjørn 2004 WGWI 2008 ICES 2008 Book 3 – Barents & Norwegian Sea ICES 2008 Book 6 – North Sea WGWI 2008</p>	85
80	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.			
100	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.			

SCORING INDICATORS		Comments	References	Score
2.5.2	Management strategy	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
60	<p>There are <u>measures</u> in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on <u>plausible argument</u> (e.g. general experience, theory or comparison with similar fisheries/ ecosystems).</p>	<p>The strategy comprises management measures that take into account available information and scientific advice on the impacts of the fishery on ecosystems. The measures have been identified, and are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/ecosystems). There is some evidence that the strategy is being implemented successfully (e.g. the measures in the strategy are being followed and intended changes are occurring).</p>	WG WIDE 2008	90
80	<p>There is a <u>partial strategy</u> in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The partial strategy is considered likely to work, based on <u>plausible argument</u> (e.g. general experience, theory or comparison with similar fisheries/ ecosystems).</p> <p>There is <u>some evidence</u> that the measures comprising the partial strategy are being implemented successfully.</p>	<p>The main impact of this fishery on the ecosystem is caused by the depletion of target stock biomass, which is assessed in P1. Detailed management strategies, including biomass and fishing mortality reference points, are in place to monitor and regulate this impact through ICES ACOM TAC recommendations, which are not only set for the target species, but also for those species which are occasionally caught as bycatch in the fishery. There is evidence that the measures are being implemented successfully.</p>		
100	<p>There is a <u>strategy</u> that consists of a <u>plan</u>, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on <u>prior experience</u>, plausible argument or <u>information</u> directly from the fishery/ecosystems involved.</p> <p>There is <u>evidence</u> that the measures are being implemented successfully.</p>	<p>The Norwegian Institute of Marine Research's Norwegian Sea Ecosystem Programme seeks to generate knowledge that will provide a basis for developing advice for the authorities in all areas that concern marine resources and the environment in the Norwegian Sea. This will inform the development of Management Plan for the Norwegian Sea.</p> <p>As there are so few other impacts on the wider ecosystem, there are relatively few management strategies in place. However clear waste management protocols are in place on all vessels in respect of domestic refuse, oil and engine room waste and waste fishing gear and vessels are legally required to maintain a waste oil logbook.</p>		

SCORING INDICATORS		Comments	References	Score
2.5.3	Information / monitoring	There is adequate knowledge of the impacts of the fishery on the ecosystem.		
60	Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity). Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>have not been investigated in detail</u> .	There is a good description of the ecosystem available and the role of the target species and main bycatch species in it – certainly adequate to broadly understanding the key elements of the ecosystem. WG WIDE 2008 gives a good description of ASH distribution relative to current and plankton, and specific research studies provide information of the impacts of climate change, whilst WGRED 2008 gives an excellent overall description of the Norwegian Sea Ecosystem. Taken in combination this provides <u>adequate information to broadly understand the key elements of the ecosystem</u> . However, not all of the impacts or interactions of the fishery have been investigated in detail, but these can be inferred from existing information.	WG Wide 2008 WGRED 2008 ICES 2008 Book 3 – Barents & Norwegian Sea ICES 2008 Book 6 – North Sea	90
80	Information is adequate to <u>broadly understand the functions</u> of the key elements of the ecosystem. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>may not have been investigated in detail</u> . The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are <u>known</u> . Sufficient information is available Sufficient data continue to be collected to detect any increase in risk level to allow some of the main consequences for the ecosystem to be inferred. Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	As detailed in the above performance indicators the impacts of the fishery on ETP species and habitats are also identified and the main functions of these on the ecosystem are understood. Sufficient data continue to be collected to detect any increase in risk level and this provides a level of information the impacts of the fishery on the components (not elements) which is sufficient to allow the main consequences for the ecosystem to be inferred and to support the development of strategies to manage ecosystem impacts.		
100	Information is adequate to <u>broadly understand the key elements</u> of the ecosystem. Main <u>interactions</u> between the fishery and these ecosystem elements can be inferred from existing information, and <u>have been investigated</u> . The impacts of the fishery on target, Bycatch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are <u>understood</u> . Sufficient information is available on the impacts of the fishery on the Components <u>and elements</u> to allow the main consequences for the ecosystem to be inferred. Information is sufficient to support the development of strategies to manage ecosystem impacts.			

Principle 3		The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.		
3.1		Governance and policy		
3.1.1	Legal and customary framework	<p>The management system exists within an appropriate and effective legal and/or customary framework that:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 & 2 • Observes the legal rights created explicitly or by custom of people dependent on fishing for food and livelihood, and • Incorporates an appropriate dispute resolution framework. 		
60	<p>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.</p> <p>The management system incorporates or is subject by law to a <u>mechanism</u> for the resolution of legal disputes arising within the system.</p> <p>Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.</p> <p>The management system has a mechanism to <u>generally respect</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>Management of this fishery is consistent with international and national law. International management is governed by the Coastal States Agreement; this provides a mechanism for dispute resolution. This has worked well and provides a good foundation for the management of this fishery.</p> <p>At regional levels management of this fishery is governed by the Common Fisheries Policy and national legislation – including relevant Norwegian (not a member of the EU, but a signatory to the Coastal States Agreement) fisheries legislation. In the recent past, for a short period the parties to the Coastal States Agreement failed to reach agreement – leaving countries to operate unilaterally. During this period all sides seemed to recognise the need for agreement, and quota allocations during this period of dispute were not altered excessively or irresponsibly. Agreement was once again re-established at the 2008 negotiations.</p>	<p>Council Regulation (EC) No 2371/2002 of 20th Dec 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy</p>	85
80	<p>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.</p> <p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes which is <u>considered to be effective</u> in dealing with most issues and that is appropriate to the context of the fishery.</p> <p>The management system or fishery is attempting to comply in a timely fashion with binding judicial decisions arising from any legal challenges.</p> <p>The management system has a mechanism to <u>observe</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system – both at EU and national levels – is subject to law, observes the legal and cultural rights of fishers and includes transparent mechanisms for dispute resolution. All of this is conducted in a manner that is consistent with the objectives of MSC principles 1 and 2. That said, there were unresolved disputes over the TAC sharing between 2003 and 2005 which suggests that the mechanisms for the resolution of disputes are not fully effective. Currently there is no formally agreed TAC allocation key.</p> <p>A clear legal framework also exists for judicial decisions to be appealed against both at national, and if necessary EU level.</p> <p>The system of industry representation (through the POs and the Pelagic RAC) and</p>	<p>Coastal States Agreement 2008</p> <p>COM(2009)163 final – Green Paper - Reform of the Common Fisheries Policy – 22nd April 2009</p>	

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100	<p>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.</p> <p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <u>tested and proven to be effective</u>.</p> <p>The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.</p> <p>The management system has a mechanism to <u>formally commit</u> to the legal rights created explicitly or established by custom on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>cooperation with managers (referred to later in P3) enables a proactive approach to be taken to avoid legal disputes.</p>		
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3.1.2	Consultation, roles and responsibilities	The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties. The management system has effective consultation processes that are open to interested and affected parties.		
60	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>generally understood</u> . The management system includes consultation processes that obtain <u>relevant information</u> from the main affected parties, including local knowledge, to inform the management system.	In consideration of this Performance Indicator it is of note that the EU allocation of quota in this fishery is 6.1% of the overall TAC. Scotland has about a 1.5% allocation of the overall TAC for this fishery.	EU-Norway 2008 agreement.	90
80	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>explicitly defined and well understood for key areas of responsibility and interaction</u> . The management system includes consultation processes that regularly <u>seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained. The consultation process <u>provides opportunity</u> for all interested and affected parties to be involved.	The key organisations involved in the management of this fishery are ICES, NEAFC (and the negotiation of the Coastal States Agreement), STECF, EC DG MARE (implementation of the CFP), the Pelagic RAC, Marine Scotland of the Scottish Government, and industry bodies (Scottish Pelagic Fisheries Association, SFF, POs and SPSG). Of note, there is high concentration of Scottish pelagic vessel representation within a small number of representative organisations – SPFA, SPSG,	Agreed Record of Conclusions between the European Community and Norway for 2008. Brussels, 28th November	

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100	<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>explicitly defined and well understood</u> for all areas of responsibility and interaction.</p> <p>The management system includes consultation processes that <u>regularly seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information and <u>explains how it is used or not used</u>.</p> <p>The consultation process <u>provides opportunity and encouragement</u> for all interested and affected parties to be involved, and <u>facilitates</u> their effective engagement.</p>	<p>and a small number of POs.</p> <p>For all these bodies functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction. Tiers of consultation are built into the processes of operation of these bodies. These structures maintain continuity of policy, practice and consultation.</p> <p>In general the consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement. In the opinion of the assessment team there does however remain, at the level of EU, Scotland / UK and industry decision-making, some scope for improving the transparency of the management system in regard to demonstration of how industry opinion, concern and information is used or not used.</p> <p>The Scottish industry is concerned that it may have a less effective voice in the management of this fishery given the dominance of Norwegian interest in this fishery. Nonetheless the mechanisms exercised through the Coastal States Agreement do give EU, Scotland and UK a clear voice in the decision-making mechanisms – which should be sufficient to address counter concerns. It is also relevant that the Scottish industry has a strong voice in the Pelagic RAC – although Norway is not a party to this EU-based organisation.</p> <p>Also of note, in April 2009 as a result of the passage of the Scottish Marine Bill through the Scottish Parliament the fisheries policy development, planning and operational arms of the Scottish Government have been renamed as "Marine Scotland", a Directorate of the Scottish Government. Within this Directorate are three relevant Divisions - Marine Scotland Compliance (formerly SFPA), Marine Scotland Science (formerly FRS), and Marine Scotland Sea Fisheries Policy (formerly the Scottish Marine Directorate).</p>	<p>2007. Negotiating Outcome. http://www.regieringen.no/en/de/p/fkd/Press-Centre/Press-releases/2007/Q-uta-agreement-between-Norway-and-the-E.html?id=491822</p> <p>Pelagic Regional Advisory Committee (PRAC) - http://www.pelagic-rac.org/</p> <p>Marine Scotland – how it works - http://www.scotland.gov.uk/Topics/Fisheries/Sea-Fisheries</p>	
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3.1.3	Long-term objectives	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.		
60	Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria, and the precautionary approach, are <u>implicit</u> within management policy.	<p>Long term management objectives are incorporated in the Coastal States Agreement with inter-year changes and updates accommodated through annual negotiation subject to the underlying decision-making mechanisms described in the basis Agreement. But the transparency of this process outside of the negotiating parties is poor.</p> <p>There is agreement on the long-term management of the Atlanto-scandian herring stock that is consistent with the precautionary approach intended to contain harvesting within safe biological limits and designed to provide for sustainable fisheries. At the coastal states level management of the fishery is based upon a clear harvest control rule (as assessed under P1). This clearly outlines specific management objectives (in the form of appropriate reference points) with regard to fishing mortality and Spawning Stock Biomass. This has been agreed by all parties, and has been evaluated by ICES as being in line with the precautionary approach.</p> <p>The reformed CFP aims to improve the basis of the decision-making process through sound and transparent scientific advice and increased participation of stakeholders. A feature of the current and any future Common Fisheries Policy is to achieve the progressive implementation of an eco-system-based approach to fisheries management. At its core is the intention to achieve efficient fishing activities within an economically viable and competitive fisheries and aquaculture industry, providing a fair standard of living for those who depend on fishing activities and taking into account the interests of consumers. In practice there has been an absence of a clear roadmap on how to move this long-term plan forward, though this may be better addressed in the reformed CFP due in 2012.</p> <p>Despite the above, no reference to socio-economic objectives – now being captured in the revised formulation of the CFP – is incorporated into the management of this fishery, or the terms of the Coastal States Agreement.</p>	<p>Agreed record of the coastal states agreement on management of the Atlanto-Scandian herring 2008 - http://www.neafc.org/system/files/herring_2009.pdf</p> <p>WGWIDE 2008</p>	85
80	<u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria, and the precautionary approach, are <u>explicit</u> within management policy.			
100	<u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>explicit</u> within <u>and required by</u> management policy.			

3.1.4	Incentives for sustainable fishing	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.		
60	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	<p>The management system and associated policies are stated clearly and provide both managers and fishermen with clear guidance on the rules governing eligibility to fish, and on required and accepted fishing practices. The management system encourages incentives that facilitate and promote the achievement of the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that negative incentives do not arise. But whilst management policy and procedures are explicitly reviewed in the context of incentives to sustainable behaviour, standards are good but not exceptional.</p> <p>Review processes explicitly consider incentives to sustainable practice in the form of:</p> <ul style="list-style-type: none"> • limited entry to the fishery through licensing, • minimum standards relating to gear specification and operation, • tight requirements on qualifications including safety training, and • specific output requirements including catch species and volume controls, bycatch and discard controls, and the monitoring systems to measure performance against these requirements. <p>In addition, the Scottish pelagic fleet effectively operates to an Individual Transferable Quota (ITQ) system in respect of the eligibility to exploit UK pelagic quota. This gives skippers and owners greater discretion as to how they organise the harvesting of available quota</p> <p>Since the 2002 revision of the CFP, subsidies that contribute to unsustainable fishing have stopped. There is no support to increase capacity, or to compensate for low catches. Set against this, however, there is clear excess capacity in this fleet – presenting opportunities for further moderation of fleet capacity to better match fishing opportunities. In addition, the industry does not pay directly for management or science, and thus partial cost recovery of management costs is only achieved through the taxation system.</p>	EC (2371/2002) - on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy	90
80	The management system encourages incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that negative incentives do not arise.			
100	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and <u>explicitly considers</u> incentives in a <u>regular review</u> of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices.			

3.2		Fishery specific management system		
3.2.1	Fishery specific objectives	The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
60	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>implicit</u> within the fishery's management system.	There are well-defined and measurable short and long term objectives for the Atlanto-Scandian herring fishery for human consumption which are consistent with MSC Principles 1 and 2. The objectives are met in the setting of the annual TAC.	WGWIDE 2008	90
80	<u>Short and long term objectives</u> , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery's management system.		Agreed record of the coastal states agreement on management of the Atlanto-Scandian herring 2008 - http://www.neafc.org/system/files/herring_2009.pdf	
100	<u>Well defined and measurable short and long term objectives</u> , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery's management system.	<p>Short-term objectives, within the management system, are principally in the form of a TAC, informed by advice from ICES. This is set at the Coastal States Agreement – negotiated annually between five parties. These short-term objectives in turn contribute to the longer term management objectives identified and agreed as part of the Coastal States Agreement (referred to in P1) - Reference Points, Harvest Strategy, and Harvest Control Rule.</p> <p>At the national level these objectives are carried down through the various operational tiers – primarily through Marine Scotland Sea Fisheries Policy, the Scottish Pelagic Fishermen's Association and the Producer Organisations. Producer Organisations are required to indicate in their annual Operational Plans how this fishery is to be exploited in the forthcoming year.</p> <p>Although the Atlanto-scandian fishery is given a relatively low priority in UK and Scotland fisheries - given the relatively low level of participation in this fishery - it is responsibly managed overall.</p>		

3.2.2	Decision-making processes	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives.		
60	There are <u>informal</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. Decision-making processes respond to <u>serious issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take <u>some</u> account of the wider implications of decisions.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. These use the precautionary approach (see 3.1.3) and are based on best available information. Clear explanations are provided in a transparent form, reflecting the outcome of monitoring, evaluation and review – in particular in the advisory work of ICES, which forms the principle source of information for management decisions.	Coastal states agreement – Atlanto Scandian herring - http://www.nafo.org/system/files/herring_2009.pdf	85
80	There are <u>established</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. Decision-making processes respond to <u>serious and other significant issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Decision-making processes use the precautionary approach and are based on best available information. Explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	The principal management decision-making takes advice at the annual Coastal States Negotiations – for 2008 held in London in November. The exact details of the decision making process which is used at the Coastal States meeting is not always clear. Accounts of the meeting can be made available, but this falls short of formal reporting to all interested stakeholders in a way that describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. In practice only the outcomes are documented.	http://www.nafo.org/system/files/herring_2009.pdf Marine Scotland – how it works - http://www.scotland.gov.uk/Topics/Fisheries/Sea-Fisheries	
100	There are <u>established</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. Decision-making processes respond to <u>all issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Decision-making processes use the precautionary approach and are based on best available information. <u>Formal reporting</u> to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.			

3.2.3	Compliance and enforcement	Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.		
60	Monitoring, control and surveillance <u>mechanisms</u> exist and are implemented in the fishery under assessment and there is a reasonable expectation that they are effective. Sanctions to deal with non-compliance exist and there is some evidence that they are applied. Fishers are <u>generally thought</u> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of fishery.	A sophisticated and robust system of monitoring, control and surveillance is in place for the Scottish pelagic fishery. In the past it is recognised that MCS has been insufficient but tighter controls were brought in by Marine Scotland Compliance (formerly the SFPA) in 2005/2006 in response to clear evidence of impropriety (substantial levels of unreported landings – primarily North Sea herring and mackerel) in the Scottish pelagic sector. A high level of compliance – in this and other pelagic fisheries – has been confirmed by Marine Scotland Compliance.	EC Reg 1566/2007 rules for the implementation of Council Regulation (EC) No 1966/2006 on electronic recording and reporting of fishing activities and on means of remote sensing	90
80	A monitoring, control and surveillance <u>system</u> has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, <u>are consistently applied</u> and thought to provide effective deterrence. <u>Some evidence exists</u> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of fishery. There is no evidence of systematic non-compliance.	There has been evidence of systematic non-compliance by this fleet in the recent past, but this has now been addressed and systems have been installed to ensure that this is no longer the case. Tighter controls are effected by higher levels of inspection on landing, complemented by a programme of at-sea inspections based on regular assessment of the risk of infractions, cross-checked against landings and sales declarations, VMS records, automatic weighing of product entering processing / freezing plants, and a requirement to undertake a mass balance audit of all processing plants at least once a year.		
100	A <u>comprehensive</u> monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, are consistently applied and <u>demonstrably</u> provide effective deterrence. There is a <u>high degree of confidence</u> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of fishery. There is no evidence of systematic non-compliance.	Similar forms and degrees of inspection are exercised in those other countries where the Scottish fleet lands Atlanto-scandian herring – Norway, Denmark, Faroe Islands. The Scottish Pelagic industry is also party to a joint industry / government protocol for inspections at processing plants. Given the location of this fishery predominantly in Norwegian waters, it is also relevant to indicate the high level of at-sea inspection applied by the Norwegian Coast Guard, and their use of International Check-Points as a means of verifying compliance of all vessels entering or leaving Norwegian waters. There is a high degree of confidence that fishers comply with the management system for this fishery, including the provision of information of importance to the effective management of fishery. Reorganisation with the Scottish control agency - Marine Scotland Compliance - has lead to some changes in organisation (reduction in number of management areas and area offices), the consequences of which are intended to improve service provision, which will need to be monitored in the future.		

3.2.4	Research plan	The fishery has a research plan that addresses the information needs of management.		
60	<u>Research</u> is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2. Research results are <u>available</u> to interested parties.	ICES establishes study groups based on information requirements identified by national delegates, including through industrial representations. Members of various ICES Working Groups focused on such elements as climate change, plankton, multi-species fisheries (ecosystem), etc. all review research, identify research requirements and undertake appropriate work. There is good communication between Working Groups (via ACOM), and between researchers through their specialist interests.	WGwide 2008	85
80	A <u>research plan</u> provides the management system with a strategic approach to research and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Research results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion.	Research / investigation are undertaken in relation to specific requirements, which generally come from the recommendations of the Stock Assessment Working Group. Given the location of most of this stock and its associated life-cycle within Norwegian jurisdiction, most research effort is provided by the Norwegian authorities – primarily the Norwegian Institute of Marine Research. This includes research into stock size, composition and life-cycle, and natural and fishery related mortality, including the development of a Barents Sea eco-system model.		
100	A <u>comprehensive research plan</u> provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Research plan and results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion and are <u>widely and publicly available</u> .	Members of the ICES community keep abreast of developments within the scientific community of relevance to the fishery under consideration. This ICES community is wider than Europe and includes relevant research elsewhere. Research contracts are let to other organisations, including Universities, (e.g. through the EC and Government of Norway) to supplement scientific understanding relevant to the fishery and related ecosystem. The results of relevant ICES research are disseminated to all interested parties in a timely fashion and are widely and publicly available. Despite the above, research planning operates in a more ad-hoc fashion than this would suggest, without a clear over-arching research strategy although it can be argued that through ICES there is a coherent and strategic approach to important elements of research in relation to principles 1, 2 and 3. Such research is usually channelled through working documents by members to the working group and is both reliable and timely. The results of such research, although not always readily available in the public domain, is disseminated to many interested parties (ICES WG members and ACOM) in a timely fashion. It should be noted that a pilot project to test the use and efficacy of CCTV coverage of all pelagic activity has recently been initiated (forms part of policy direction being promoted by Nordic group to reduce / eradicate discarding) in all fisheries, in all waters. This includes testing on board two or three Scottish vessels – although not necessarily whilst targeting ASH.		

3.2.5	Monitoring and evaluation	There is a system for monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
60	The fishery has in place mechanisms to evaluate <u>some</u> parts of the management system and is subject to <u>occasional internal</u> review.	<p>There is a comprehensive system of monitoring of information relevant for management decision-making and stock assessment purposes. ICES working group stock assessments are also subject to external review. ICES engages external scientists to undertake review of its methodologies if considered necessary, but this has not been deemed necessary for the Atlanto-scandian herring fishery.</p> <p>There are also well established systems of monitoring of the performance of fishery related input and output controls. Due to the systems described in 3.2.3 this monitoring now forms a substantially more accurate reflection of actual fishing mortality. Additional monitoring is also in place to provide sufficient information to support stock assessment work (for example length / weight monitoring). High quality, well-documented procedures exist to reduce harvest in light of monitoring results. These can be quickly implemented (near real-time recording of catch levels and quota uptake – and annual review of stock status).</p> <p>Management policies and practices are regularly reviewed through established review protocols that operate in relation to each tier of organisation involved in the management of this stock – ICES, NEAFC / Coastal States, EU / STECF. At an operational level reviews are undertaken through the Pelagic RAC, ACFA, and national level dialogues between government, industry and scientists.</p>	<p>ICES ACOM - http://www.ices.dk/iceswork/acom.asp</p> <p>STECF - https://stecf.jrc.ec.europa.eu/secreports</p> <p>WGWIDE 2008</p>	80
80	The fishery has in place mechanisms to evaluate <u>key</u> parts of the management system and is subject to <u>regular internal</u> and <u>occasional external</u> review.			
100	The fishery has in place mechanisms to evaluate <u>all</u> parts of the management system and is subject to <u>regular internal</u> and <u>external</u> review.			

Appendix 4 – Peer Review comments

Peer Reviewer A

General:

The report is well presented and structured in such a way that makes it easy to refer back from the scoring comments to justify the scores. There is an abundance of useful information in the report on which to base the assessment against the three MSC Principles. We are dealing with what is now the *largest herring stock in the world and the largest stock of any commercial species in North Atlantic*. I am not convinced that this exciting and important aspect comes across clearly to the reader who may not be familiar with this stock. **FCI comment: Italicised sentence above inserted at start of section 2.5.**

Generally the report is well illustrated and contains some very useful figures such as the one showing the distribution areas and migration pattern. It is also useful to see the distribution of the SPSG fishery in 2008 clearly indicating that it occurs in the Norwegian EEZ. The section on stock status would benefit from more illustrations and I suggest that as well as SSB we have figures showing historic landings back to at least 1950, fishing mortality, recruitment and current age structure of the stock. You should consider using the data for these from the most recent working group report WGWIDE 2009 which was published in October. Whilst appreciating that this post dates your assessment, this can easily be briefly explained in the text. **FCI comment: The report already clearly points to the relevant working group report for interested readers. This information, while interesting, is not directly relevant to this assessment.**

In many of the scoring comments there is a need to improve the justification for the score by explaining which elements of the scoring criteria are met. This is particularly useful where the suggested score falls partially into the 100 criteria. In that case you should, for example, be stating '*all of the 80 scoring criteria have been met but only the first of the three 100 criteria justifying a score of 85*'. **FCI comment: Noted and addressed at specific points detailed below.**

I have noted under comments on section 3.1 that the report needs a comprehensive 'Glossary' of all the acronyms and other terms used in the report. This should appear fairly early on in the report. **FCI comment: Glossary added.**

Finally the method of recording many of the references in the text is unnecessarily clumsy. This applies in particular to the ICES reports which are quoted in the text in too much detail. For a working group report (ACFM, 2000) for example is sufficient. Leave further detail to the reference list. **FCI comment: The method of recording references in the text has been agreed as the best approach to eliminate errors when more than one individual is working on the report and for better auditing procedures.**

Specific comments:

2.3 There is a good explanation here of why all 25 SPSG vessels are included in the list although not all may have quota or may not fish their quota. All the vessels are developing technologically all of the time in particular with dual frequency sonar differentiation of shoals of pelagic fish. In that context one of the vessels 'Sunbeam' has recently been featured in the UK weekly journal 'Fishing News'. She is now fitted with the latest Simrad SX93 dual mode sonar which has a dedicated scientific output which allows the vessel to participate in scientific research projects. This could be worth mentioning in the context of contributing to and participating in relevant scientific research. As an example of performance the article mentions that 'Sunbeam' recently located a mackerel shoal which it was able to measure at 3.5km long, 50m deep and containing an estimated 200,000t of mackerel. **FCI comment: New text added to section 5.8 relating to research involvement.**

In the description of the gear you should provide some description of the mesh configuration and mesh sizes with the very large meshes in the wings for herding, tapering to finer meshes in the square and belly and eventually the cod end. This is important in terms of escape of small fish and also of potential ecosystem impact on the pelagic ecosystem. I am thinking here not only of the escape of small fishes

but also pelagic invertebrates such as jellyfish which can be destroyed in large numbers in pelagic fisheries. **FCI comment: Further text added to the gear description.**

2.4 Under the final bullet point you should mention that the pelagic processing factories are required to have the facility to record the actual weight of fish landed to them. **FCI comment: Text added as suggested.**

2.5 In the context of larval drift you should mention the main driving force namely the North Atlantic drift, the current which bathes the Norwegian coast in relatively warm water and transports the passive planktonic organisms northwards and into the Barents Sea. In fact it would be useful for other reasons to have a figure showing the generalised water movements over the whole area of distribution of the stock. **FCI comment: Text added as suggested, although figure not added, as not immediately relevant to the assessment, or more particularly the assessment conclusions.**

You state here that Atlanto-scandian herring recruit to the spawning stock at 5 years old. This is not a knife edge recruitment as later in the text you mention that first spawning may occur at 3 years old. A maturity with age table should be included here with some explanation of changes in the age at maturity over time. This kind of information is valuable and is a good example of the kind of supportive research carried out by ICES working group members which I have mentioned in support of a better score under performance indicator 3.2.4. **FCI comment: The text has been amended to add to clarify. A table has not been added as this is considered too much unnecessary quantitative detail. See also comments below under 3.2.4**

In the final paragraph under 'Geographic range' you mention in the context of 'climatic change' a correlation between zooplankton biomass, stock condition and reproductive success. Again this is an extremely interesting and valuable piece of supportive research. If possible I would like to see this presented in simple graphical format in this report. **FCI comment: This was reported in the working group report, but no further details are available. It can be presumed that it results from the ecosystem surveys in the area. This information is not currently used in the harvest strategy and therefore is most relevant to PI 3.2.4.**

After the section on 'diet' you should include a short section mentioning the importance of herring as a prey item for other fish and sea mammals. They are basically a lower trophic level species that play an important role in the food web throughout all their life history stages. **FCI comment: Text added as suggested.**

2.6 In the context of the development of the fishery you should mention very specifically the development of the power block for purse seining. This allowed this method of fishing to be used by much larger vessels working away from the coast because they no longer need to use small 'dorys' to deploy the purse seine. **FCI comment: Text added as suggested.**

In relation to the 'cut back' in other fisheries it is worth mentioning the total collapse of the North Sea mackerel fishery during the late 1970's and the subsequent demise of that element of the NEA stock. **FCI comment: Text added as suggested.**

At the end of paragraph 5 it would be useful to briefly explain the term 'relative stability' in the context of the EU fleet. It is not a term which will be widely understood outside European fishery management circles. **FCI comment: Footnote added explaining relative stability.**

Figure 5 is one of those which would benefit from being quickly updated to the most recent report (WGwide, 2009) providing the 2008 information. **FCI comment: This was correct at the time of scoring, and no significant changes are thought to have occurred – certainly none which will impact on assessment conclusions or scoring.**

3.1 Paragraph 2, last sentence should read ' The 2004 year class has not yet fully recruited to the spawning stock' **FCI comment: Amended**

It would be useful at the start of this section to mention that the assessment is now part of the new ICES Working Group WGwide. You should describe briefly how this works, who participates and when and how frequently it meets. You should also explain how the advice emanating from that Working group is

eventually promulgated. It needs to go in at this stage because you are already beginning to talk about the working group and ICES advice. **FCI comment: Text has been added under section 3.2 and reference made to this in 3.1.**

I notice now that you are beginning to use numerous acronyms and terms such as TACs and Bpa without explanation. This should be covered by a comprehensive 'Glossary' of all terms used in the report and that should be at the beginning of the report. **FCI comment: Glossary added.**

I suggest that you change the final sentence in paragraph 3 to 'with a TAC of 1.518 million tonnes in 2008 and the forecast of good recruitment, SSB is predicted to increase to 12.4 million tonnes in 2009. **FCI: Amended as suggested**

You have included a large section which in essence is attempting to de-value the validity/ reliability of the reference points. In fact these points are as well as established as those for many other well managed stocks in European waters and have been subjected to considerable scientific scrutiny. As you have accepted they are all well established and used in a precautionary manner. I have further commented on this under scoring where I think that you have been rather harsh. **FCI comment: The paragraph is factual and is not meant to de-value anything. Our interpretation of this information is rather that the reference points have undergone considerable scrutiny as the reviewers suggests and provides clear evidence for this.**

3.2 You have now introduced the 'Coastal States' negotiation and agreement. This has not yet been explained but could have been covered in section 2.1 under the 'management system. **FCI: An explanation of division of quota among coastal states is provided in section 2.6.**

The penultimate paragraph notes that discarding and slippage are not recorded. This is the subject of a later recommendation for the SPSG fleet which operates in Norwegian waters where the practice is illegal. However in relation to the fishery as a whole (Principle 1) there should be more detail regarding the practice, how widespread it may be, particularly in the purse seine fleets, and the various other sources. In that context it should be noted that even in Norwegian waters the practice of slipping lightly pursed catches is not considered as discarding and is therefore permitted. **FCI comment: This is only relevant, outside the unit of certification, to the extent that it affects the stock assessment and setting of the TAC, and the efficacy of the TAC, which is dealt with elsewhere.**

The last paragraph relating to by-catches of saithe, pursuing herring as a prey item, is interesting. More detail is needed of the contemporaneous monitoring of such by-catches leading to closure of the fishery. The level of by-catch which may lead to a closure and an example of a closure to show the effectiveness of the measure should be included. **FCI comment: This notes that the management tool exists, but we know of no example where it has been applied. Retained bycatches of saithe accurately monitored and recorded and are currently small and not likely to be of concern.**

3.4 Under the sub heading 'Catches' some further explanation of where the unaccounted mortality is coming from is required. Can the SPSG fleet be excluded from this source of mortality related to 'fishing operations and 'under reporting'? Is the under reporting being generated by the generous allowance for estimated catches which are subsequently not subject to landings inspections? This is still a serious fisheries management issue however unimportant the working group consider it to be in relation to the assessment. It is no coincidence that such catches are invariably underestimated and rarely, if ever, over estimated. **FCI comment: The SPSG fleet is excluded from this. There is always a question over how much independent monitoring should be required however. IUU catches, where suspected, are always a cause of anxiety because by definition how much and where they are coming from is unknown. This is a very serious issue, which has been carefully considered under the separate PI 1.2.2, 1.2.3 and 1.2.4.**

3.5 In the fourth paragraph you should briefly explain the 'bootstrapping technique' for the non statistical reader. You should also justify the statement that 'the bootstrap method applied appears reasonable'. **FCI comment: Text has been clarified.**

The penultimate paragraph relating to climatic conditions and plankton production appears to be pure speculation with no scientific support unless you can provide a reference. Without such a reference this

statement should not form a part of this report. FCI comment: It is speculation with no scientific support, but is included to illustrate uncertainty over the processes that might be occurring. Uncertainty as well as scientific certainty needs to be accounted for in the management system. As for all the unreferenced material, it was obtained from the stock assessment reports identified at the beginning of section 3. The text has been clarified.

4.1 I am assuming that you are confident that all forms of slipping are now illegal in Norwegian waters. It would be useful to check and quote the relevant legislation and make sure that there are no exclusions for an example for lightly pursued catches which the Norwegians do not consider to be mortality. FCI comment: New box, detailing the legislation now added to section 4.2 of the report.

It is good to note that the SPSG now has a recording protocol for slippage in other pelagic fisheries. This subject is generating a recommendation of this certification that the protocol is extended to all vessels participating in the AS herring fishery. It is important that this happens and as such perhaps a Condition, which would be easy to comply with, should be generated instead. FCI – A condition can only be generated where a PI scores below 80 – given the potential scale of the problem this was not warranted. As the SPSG are already being pro-active in this area (as a result of conditions in other certified fisheries) and are happy to extend this practise to the ASH fishery, a recommendation appears adequate.

5.5 In the last paragraph you should simply explain the process for stopping a fishery, nationally and internationally, once the quota has been taken up. How long does the process take and as a result is there any potential for excess to be taken pending legislation. Within that explanation you need to describe the process for transfer of the relevant information from the Norwegian authorities, where most of the SPSG catch is landed, to the UK who would legislate to stop the fishery. An example of the system in operation would be useful. FCI comment: There is no evidence of any concern in process, and no reason to assume that this does not work as intended. The SPSG vessels make use of their entire allocation early in the year so this level of detail is not thought relevant to the assessment report.

5.6 You need to include Norway and Iceland in this section as neither are in the EU and neither of them participate in the Pelagic RAC as far as I am aware. FCI comment: Reference to the other countries and the coastal states now included.

5.8 You need to include the Coastal states organisation in this section, not just the EU, otherwise you are again excluding Norway and Iceland other than through their involvement in ICES. FCI comment: Reference to coastal states added to section 5.9.

On a positive note you could also mention the involvement of SPSG vessels in scientific support and in particular the use of the latest sonar system on 'Sunbeam'. FCI comment: Added.

8.4 Under conditions and recommendations the first one regarding extending the current protocol within the fleet to record all instances of contact with ETP species and all instances of discarding (slippage) to the AS herring fishery, needs to be strengthened. This could be done by simply replacing 'should' with 'must'. In my opinion this issue is sufficiently important to be close to justifying a Condition rather than a recommendation (see also 4.1 above). FCI comment: FCI – A condition can only be generated where a PI scores below 80 – given that the assessors are satisfied that the potential scale of the problem is significantly smaller than other SPSG certified fisheries, this was not warranted. As the SPSG are already being pro-active in this area (as a result of conditions in other certified fisheries) and are happy to extend this practise to the ASH fishery, a recommendation appears adequate. It is also noted that none of the other recently certified fisheries (using the same AT) for this stock have such a condition.

Scoring

FCI: Scores have only been changed where there is strong justification, for example supported by a new reference. Suggestions for score changes of 5 points have generally not been acted upon, unless there is strong reasoning or where it would result in imposition of a condition. Suggested score changes of 10 or more points are more likely to bring about a change in score. In all cases FCI justification for action, or inaction is

provided. It is notable that in this instance there is a peer reviewer suggestion for some scores to increase, whilst others should decrease – suggesting that overall there has not been either a positive or negative bias in the original scoring.

Where I have not commented on the scoring this indicates that I am content to endorse both the scoring comments and the score.

1.1.2 The reference points are as good as most reference points for NW European commercial fisheries. The important precautionary points for Bpa and Blim are appropriate and have been tested through rigorous statistical simulation. Both have been tested and approved by the ICES working group of experts (WKREF). These reference points meet all of the 80 scoring criteria and at least some of the 100 criteria based on the MSC guidance notes. The score should be increased to 90 which still reflects that Bmsy has not been defined although a default for Bmsy at twice Blim could be assumed as a proxy. **FCI comment:** It is true that the reference points are as good as most reference points for NW European commercial fisheries, but the comparison must be made with the MSC standard, not European practices. The assessment team may use its own reference points to assess status, although we prefer not to, but cannot score its own proposed reference points as suggested here. This PI is used to assess the management reference points as used. It is the lack of clear definition of a target and evidence that reference points are fully aligned with MSC requirements which causes problems here and prevents a higher score.

1.2.4 Your description meets half the 100 scoring criteria and the score should be increased to 90. **FCI comment:** The text has been corrected.

2.2.2, This clearly meets the first two elements of the 100 guidepost and some of the third and the score should be increased to 95. **FCI comment:** Text added stating that “if more independent observer reports confirming this were available to the assessors then a score approaching 100 (on the basis of clear evidence) may have been awarded”. The score therefore remains unchanged.

2.3.1 Whilst it would be easy to conclude that some of the 100 scoring criteria are met for this fishery you have rightly erred on the side of caution, bearing in mind that you have generated a recommendation related to this issue.

2.4.1 This is a difficult one to score – obviously the fishery achieves the ‘highly unlikely’ part of the 80 guidepost but for the 100 guidepost there is only one additional criterion and that is ‘evidence’. I suppose that there is some evidence but I would suggest that it is not enough for a score of 95 and consider 85 / 90 to be more appropriate. **FCI comment:** Given the requirement for harmonisation between similar fisheries, a score of 95 is already more precautionary than the other certified fisheries using the same assessment tree (for the Danish fishery and the Faroese fishery in assessment). The score therefore remains unchanged.

2.4.2 & 2.4.3 The scores should be similarly reduced in line with 2.4.1 above. **FCI comment:** The same applies as for 2.4.1. Indeed the information score for this fishery is already 10 points below the comparable fisheries.

2.5.1 There is also the potential for an impact on planktonic macro fauna, which you have not mentioned. Whilst you have a lot of information about the pelagic ecosystem in the Norwegian Sea there really isn’t strong evidence of the potential impacts of the fishery on the whole ecosystem. Without such evidence it is difficult to go beyond saying that it is ‘highly unlikely to’ therefore the score should be 80 but you have scored it 85 and I would not argue too strongly against that. **FCI comment:** Mention already made of planktonic macro-fauna although score remains unchanged.

2.5.2 & 2.5.3 Linked to 2.5.1 above and for similar reasons the score for each should be no more than 85. **FCI comment:** Scores are in line with other comparable fisheries. As adjustments are not critical and do not impact on overall conclusion or conditions, a change is not justified.

3.1.1 You should also include relevant Icelandic legislation after ‘Norwegian’ in paragraph 2. **FCI:** Icelandic legislation is not relevant as the SPSG vessels do not target ASH in Icelandic waters.

There were unresolved disputes over the TAC sharing between 2003 and 2005 which suggests that the mechanisms for the resolution of disputes are not fully effective. Currently there is no formally agreed TAC allocation key. This performance indicator only achieves the elements of the 80 scoring guidepost and the score should therefore be reduced. **FCI comment: Text added and score reduced to 85 (mid point between assessment team's conclusion and peer reviewers conclusion).**

3.1.3 There is only a subtle difference in the scoring criteria between 80 and 100. This performance indicator refers to the long term management of all aspects of the fishery and on balance it should score 90. **FCI comment: Score unchanged.**

3.1.4 I think that the improved performance of the SPSG fleet in relation to pelagic fisheries is such that a score of 95 can be well justified. Once the recommendation to record and report all slippage events has been incorporated into the code of practice, and been seen to work, this element would achieve a 100 score. **FCI comment: Score adjusted to 90 – midway between the assessment team's conclusion and the peer reviewers conclusion.**

3.2.1 Once again only a subtle, and not very helpful, difference in the scoring between the 80 and 100 guideposts. A score of 90 seems appropriate although your very first sentence virtually repeats the 100 scoring criteria apart from the word demonstrably being omitted. **FCI comment: No change.**

3.2.2 You have made an interesting point about the lack of clarity regarding details of the Coastal States meetings, where in practice only the eventual outcomes of the meetings are documented into the public domain. Industry involvement in the Coastal States meetings, such as occurs in the Pelagic RACs, would address this issue but I accept that SPSG is hardly in a strong position to lobby for such involvement. You have made a good case for a score of just 85.

3.2.4 It is accepted that research planning appears to be *ad hoc* which may be the inevitable result of funding difficulties at most Marine Institutes. However I do feel that through ICES there is a coherent and strategic approach to important elements of research in relation to principles 1, 2 and 3. Such research is usually channelled through working documents by members to the working group and is both reliable and timely. The results of such research, although not always readily available in the public domain, is disseminated to all interested parties (ICES WG members and ACOM) in a timely fashion. A score of 90 can be well justified in that this performance indicator achieves at least half of the 100 scoring criteria. **FCI comment: Score adjusted upward to 85 – midpoint between the assessment team conclusion and the peer reviewers conclusion. Text added.**

3.2.5 The final paragraph is not really relevant to this performance indicator and concerns monitoring of the fishery rather than monitoring and evaluation of the management system. This paragraph should be moved to section 1.2.3 (monitoring the catch) and noted also in 2.1.3 (monitoring retained species) and 2.3.3 Monitoring ETP species). **FCI comment: Final paragraph moved to 1.2.3.**

Peer Reviewer B

Overview

The assessment team is to be commended for their review of the Scottish Pelagic Sustainability Group (SPSG) Atlanto-Scandian herring fishery. They have provided a thorough and detailed background report to support scores of 31 performance indicators. Their comments for each performance indicator were detailed, to the point, and well reasoned.

The SPSG is also to be commended for promoting sustainable fisheries. The group was formed only two years ago but already has had two of its member fisheries declared to be sustainable by the MSC. This represents a remarkable achievement for a group that was found to be in contravention of catch limits for a number of pelagic species as recently as the early 2000s.

There are several positive factors to suggest that the SPSG Atlanto-Scandian fishery be declared sustainable. The fishery includes the same vessels, the same landing procedures, and the same

enforcement controls as previously certified fisheries. It also utilizes a gear (mid water trawl) that has no impact on bottom habitat and the stock upon which it fishes is deemed by ICES to be harvested sustainably.

There are also other positive signals. The Atlanto-Scandian herring stock has benefited from four large year classes (1998, 1999, 2002, and 2004) over a ten year period. There are also indications that the 2008 year class may be large. The phenomenon of multiple large year classes is unusual for a stock that, historically, has exhibited sporadic strong recruitment.

The stock assessment is also reassuring as the current estimate of spawning stock biomass (SSB) is well above B_{pa} and fishing mortality is well below F_{pa} . Catches and SSB are expected to increase over the next few years as the 2004 year class recruits to the fishery. Although retrospective analyses indicated an underestimation of SSB and an overestimation of fishing mortality, these biases help as advice based on most recent estimates is more likely to be precautionary.

Fleet renewal and replacement has also been a positive factor. Although there is still over-capacity in the fleet, there are no longer subsidies that contribute to unsustainable fisheries; the fleet has therefore become more efficient. The fact that the SPSG fishery occurs in Norwegian waters may also be beneficial as the vessels are monitored at sea by the Norwegian navy and may be subject to greater scrutiny than if they fished in Scottish waters.

As is to be expected, there are also some areas of concern regarding sustainability certification. Although the Atlanto-Scandian herring stock has benefited from improved management over the last two decades, there have been periods in the recent past when the Parties exploiting the resource could not reach agreement regarding quota allocations. It was simply fortuitous that fishing mortality was not higher during this period. The assessment team indicates that “a consultation between the managing states in 2007 finally led to a decision on quota distribution and a statement of intent to maintain stability in the ratios in the future”. A “statement of intent” is not very reassuring and is a cause for future concern.

It has been shown that there is a strong environmental influence on productivity and recruitment. Therefore, there is a degree of uncertainty on how changes in the environment may impact future recruitment.

Overwintering areas are not stable, as there have been at least six since 1950. The assessment team has indicated that the monitoring system “appears adequate” to detect and monitor these changes; this is not very reassuring and, consequently, a source of uncertainty.

The change in migration patterns and overwintering areas has made it difficult to develop a time series of population estimates from fisheries independent surveys. The assessment team expressed concern that in 2008, the international ecosystem survey did not cover the Norwegian zone east of 20 degrees east, due to technical and administrative difficulties. The term “administrative difficulties” raises a red flag and is a cause for concern.

One further source of uncertainty is the lack of information on slippage / discards. The assessment team indicates, numerous times throughout the report, that discards are negligible. However, there are no data available to support this conclusion. This is a major cause of concern and one that needs to be addressed. **FCI comment: This is addressed as a recommendation, for a continuation of reporting procedures used in other SPSG certified pelagic fisheries, although all available evidence and rational justification points to the scale of the potential problem being far smaller in this fishery than those previously certified.**

Review of Background Report

FCI: Note that the page numbers below are now inaccurate due to changes made in the text as a result of earlier reviewer comments.

Page 7; Paragraph 3

- There is an inconsistency; in this paragraph it indicates that “first spawning occurs at age 3”. However, on page 6, paragraph 6, it indicates that “herring recruit to the spawning stock at 5 years of age”. This should be clarified. **FCI comment: Text has been clarified.**

Page 8, Paragraph 2

- It indicates that “continued fishing pressure combined with poor recruitment led to a substantial reduction in stock size”. It would be more correct to indicate that overfishing combined with poor recruitment led to a substantial reduction in stock size. **FCI comment: Amended as suggested**

Page 13, Paragraph 4

- There is an inconsistency as in this paragraph it indicates that “management consensus has been lacking in the fishery in the past”. However, in the previous paragraph, it indicates that “there is evidence that the management system is able to implement controls”. This should be clarified. **FCI comment: Further clarification provided in the text.**

Page 13; Paragraph 8

- It indicates that “a minimum landing size regulation of 25 cm has been in place since 1977”. Is there an allowable percentage of undersized herring allowed in commercial catches? If so, what is it? This requires further explanation. **FCI comment: New box detailing the relevant legislation added to report section 4.2**

Page 14; Paragraph 4

- It indicates that “should catches, for whatever reason, rise significantly above 1,500,000 t, it may be necessary to reconsider the precautionary nature of the plan”. What is considered to be significantly above? The TAC for 2009 is set at 1,643,000 t; is this significantly above? **FCI comment: “Significant” would here be interpreted as in the expert view of the scientific working group. However, we agree with the reviewer and have raised a note in the scoring table relevant to the surveillance audit and the harvest control rule should be tested as it is actually applied. Higher TACs imply higher abundance, so we would suggest less than 10% would not be significant, but we have raised a recommendation on this issue.**

Page 16; Item 3

- More detail would be useful as to why the data from this survey are still used in the assessment. **FCI comment: This additional level of detail is not justified in adding clarity to the overall report or assessment conclusion.**

Page 16; Item 6

- It indicates that larval indices are used as an indicator of spawning stock size; it also indicates that the 2008 estimate is the highest number of larvae recorded in the time series. Is there a relationship between larval abundance and year class size? This requires further explanation as it suggests that the 2008 year class may be very large. **FCI comment: Larvae production is related to SSB. This indicates that both the SSB in 2008 and the 2008 year class are independently large. There is no simple stock recruitment relationship. The interested reader is referred to the various references for an explanation, but is unlikely to find a simple one.**

Page 17; Paragraph 8

- It indicates that based upon retrospective analyses, estimates of SSB have been revised upwards for the past three years. It would be useful to explain by how much these estimates have been revised. **FCI comment: The “revision” occurs naturally in the assessment as the cohort becomes fully**

recruited. No table of retrospective biases are given, but they are rather used as indications of uncertainty and informal goodness-of-fit of the model and among a number of model fits.

Page 27; Paragraph 7

- “Management authorities and industry instituted major changes in reporting, monitoring, and surveillance”. Further explanation is required as to what constitutes “major changes” as it would help to provide context as to how much fleet practices have changed since the early 2000s. **FCI comment: Text added.**

Page 28; Paragraph 7

- It is unclear if this paragraph refers to the entire Atlanto-Scandian herring fishery or just the SPSG component. **FCI comment: Text clarified, referring to both.**

Page 30; Paragraph 4

- Other than the 11 individuals listed in Table 3, who were the 51 stakeholder organizations and individuals that were contacted? It would be useful to provide this information in a table in an appendix. **FCI comment: The stakeholders listed were those who wished to participate at the site visit, the remaining are those who are on the stakeholder email database and did not necessarily wish to be listed in the report.**

Page 30; Paragraph 7

- “Written and verbal representations were provided to the assessment team expressing a range of views, opinions and concerns”. What were the range of views, opinions, and concerns? The assessment team has indicated that these have been adequately debated and addressed. It would be beneficial if the concerns were stated so that the reader may judge for his/her own self. **FCI comment: The range of opinions and concerns are embraced in the overall body, balance and justification of the scoring. The reasonably high scoring nature of this assessment is indicative of the fact that there was not a wide range of views, or strongly differing opinions, or major concerns.**

Review of Scoring Sheet

Comments on the scoring sheet are restricted only to those performance indicators where a there is a concern.

1.2.1 Harvest strategy

The assessment team indicates that there are fishery independent surveys which provide estimates of stock status. However, given the many changes in overwintering areas and changes in migration patterns, all of these survey time series have been compromised to some extent. They also indicate that the harvest strategy has not been implemented consistently through the years. Although the participating countries have currently agreed to annual TACs, this remains a concern for the future. They further point out that there is no information on discarding or other unrecorded mortality; slippage is unrecorded. It may be considered to be negligible but there are no quantitative data to support this. Therefore, a score of 80 may be more appropriate for this performance indicator. **FCI comment: These uncertainties associated with information are noted and have been addressed under PI 1.2.3. The key issue here is the lack of testing for the current harvest strategy. However, it is noticed that the overall management system has regenerated the fishery from a low stock level by reducing fishing mortality sufficiently to allow recovery. This indicates that the management has the will, ability and tools to apply appropriate management measures which are now more formalised. With the review process and more transparent management objectives, we feel this is sufficient evidence to give us confidence for a higher score.**

1.2.2 Harvest control rule(s) and tools

The assessment team indicates that the evaluation of the management plan applied a catch ceiling which is not applied in practice and could be exceeded. I suggest that this be re-worded as it will be exceeded in 2009 if the TAC is taken and probably has been exceeded in 2008, if slippage / discards

were included. FCI comment: An amendment has been made to the scoring table. We are currently not too concerned because this problem has been highly within the management process and is not yet significant in our opinion. However, if the issue is not dealt with, it could lead to a lower score.

1.2.2 Information / monitoring

The assessment team indicates that the abundance surveys remain comprehensive enough to monitor stock abundance accurately. It is uncertain if this is true; what survey achieved this in 2008? There are also concerns regarding conflicting signals from survey information on the youngest ages. They also indicate that survey sampling of age and weight is “sufficient”. I would suggest that it is “excellent”.

They further point out that the assessment working group believes that unrecorded mortality is negligible. As indicated before, there are no quantitative data to support this. Therefore, a score of 85 may be more appropriate for this performance indicator. FCI comment: There are a number of surveys conducted, which have undergone thorough reviews and analysis to minimise their bias. While the situation is not as good as it could be and the survey approach appears expensive, the level of information seems at least adequate for the stock assessment. And unless we have indications otherwise, we have to accept the working groups view on this.

2.2.1 Outcome status

The assessment team indicates that there is no evidence of slippage in this fishery and slippage is illegal in Norwegian waters. This is not to say that it doesn't occur. Slippage may be more unlikely now as all large year classes are above the minimum legal length. However, it may be an issue in the future if the 2008 is large and it mixes with larger fish or if the fishery targets a certain fish size to meet market demands. FCI comment: this will be an issue to review at the time of surveillance audit.

2.2.2 Information / monitoring

The assessment team indicates that although all qualitative information suggests that the scale of slippage is low in this fishery, there is little or no information to confirm this and there has been a low level of observer coverage. They go on to recommend that the newly adopted SPSG discard / slippage trip report should be extended to this fishery to provide more quantitative information.

A score of 75 may be more appropriate for this performance indicator as it would make the provision of such a trip report a condition of certification. FCI comment: All available evidence and expert witness, indicates that the scale of the potential problem is small – certainly when compared with other certified fisheries such as mackerel. There is reasoned argument why the targeted mode of operation of the SPSG fleet, in particular in season and location of activity (operating in an area where slippage is illegal), means that the risk of slippage is substantially reduced – compared to other SPSG certified fisheries. The assessment team gave the question of slippage extensive extended consideration and concluded that it did not merit a condition. The score of 80 is already below that awarded to other MSC certified ASH fisheries, even though those fisheries operate in jurisdictions where slippage is not illegal, and operate in areas and seasons where mixing and small sizes may be more likely. The SPSG have demonstrated a serious commitment to minimise slippage in other fisheries and have indicated a willingness to extend existing reporting protocols to this fishery.

2.5.1 Ecosystem status

The assessment team indicates that there is a good evidence base for understanding the status of the ecosystem. This has not been adequately explained in either the report text or in the performance indicator comment. FCI comment: Further reference added.

3.1.1 Legal and customary framework

The assessment team indicates that in the recent past, the Parties failed to reach agreement but that agreement was re-established in 2008.

This is a cause for concern and needs to be monitored closely in the future. It is not likely that this performance indicator would have a failing score but it could drop below the unconditional grade of 80. FCI comment: This score has been reduced to 85.

3.2.4 Research plan

The assessment team indicates that research planning operates in an ad-hoc fashion, without a clear over-arching research strategy. This suggests that a score of 80 may be generous as research is ongoing but not in a planned or strategic approach. FCI: further text has been added after the 'ad hoc' comment to clarify.

They also indicate that a pilot project to test the use of CCTV has been initiated to reduce / eradicate discarding, including tests on board two or three Scottish vessels. This appears to be contrary to earlier statements which indicated that discarding was not an issue. FCI comment: Text added to clarify that this is work across all pelagic fisheries, and does not relate directly to a risk in the SPSG atlanto-scandian herring fishery.

3.2.5 Monitoring and evaluation

The assessment team indicates that the principal weakness of the monitoring programme in place for this fishery is the limited scientific observer coverage.

A score of 75 may be more appropriate for this performance indicator as it would then require increased observer coverage as a condition of certification. Increased coverage would provide several benefits including, estimation of slippage / discards, interaction with ecologically threatened species, and occurrence of bottom perturbation by the mid water trawl. FCI comment: Reference to the need for increased observer coverage has now been moved to 1.2.3. The question of conditions relating to observer coverage to verify slippage has been dealt with in comments above.

Conclusions

With regards to principle 1, the Atlanto-Scandian herring stock is currently considered to be highly sustainable. The current estimate of SSB is well above B_{pa} and fishing mortality is well below F_{pa} . Catches and SSB are expected to increase over the next few years as the 2004 year class recruits to the fishery and there is recent evidence to suggest that the 2008 year class may be large. There are some concerns regarding the reliability of reference points for the stock but these are not considered to be serious given the current estimate of stock size.

With regards to principle 2, the SPSG Atlanto-Scandian herring fishery currently has minimal measurable impact on the ecosystem. Mid water trawls have no negative impact on the substrate and by-catch in the fishery is minimal. There are no estimates of slippage / discards; this must be addressed.

With regards to principle 3, there is currently an effective management system for the Atlanto-Scandian herring fishery in general and for the SPSG fishery in particular. However, as recently as 2006, an effective management system did not exist and unilateral quotas were set. Managing states have committed to a statement of intent to maintain stability in quota distribution. This must be monitored closely as it may affect the future sustainability of any fishery dependent upon the Atlanto-Scandian herring stock.

Given that the Scottish Pelagic Sustainability Group Atlanto-Scandian herring fishery meets these three principles, I concur with the assessment team that this fishery be certified according to the Marine Stewardship Council principles and criteria for sustainable fisheries. However, I recommend at least two conditions for certification.

The assessment team has provided two recommendations, the first concerning trip reporting protocols and the second regarding observer reports. I recommend that these be strengthened and made conditions for certification. FCI: see below

I have concerns regarding the potential for slippage in this fishery. The report emphasizes that slippage is not currently considered to be a problem. However, there are no data to support this conclusion. Slippage may also be an issue in the future if juvenile and mature fish were to mix or if the fishery were to target a certain size of fish to meet market demands. It can be argued that slippage in this fishery would have minimal effect on the entire stock given that the fishery represents less than 2% of the overall TAC. However, the consequences would be serious if this rationale were applied to all fisheries. The monitoring and reporting of slippage should be a condition of certification. **FCI comment: Recent *pers comms* with both Marine Scotland (Science) and the Norwegian Institute of Marine Research further support the assertion that slippage is likely to be a minor problem when the SPSG vessels target Atlanto-Scandian in Norwegian waters. There are a number of reasons for this assertion – the practice is illegal where the SPSG vessels target the resource, with a high likelihood of detection. At the time of year they target the resource, shoals are densely aggregated with 100% clean landings by Norwegian vessels fairly typical at this time of year and location, and above all there is less price distinction with herring between small and large, than say mackerel, so there is a less obvious economic incentive to slip hauls of small fish. If however the fishery were to take place in different jurisdictions, at different times of the year then some of the confidence behind this assertion is lost, as a result the report clearly states (in section 2.6) that in event of such a change the SPSG shall, at the earliest opportunity, inform FCI, who will consider the implications of any such change, in the context of overall fishery assessment.**

Similarly, increased observer coverage should be made a condition for certification. The assessment team has indicated that the principal weakness of the monitoring programme for this fishery is the limited scientific observer coverage. In addition to reporting interactions with endangered, threatened, and protected species, increased coverage would provide estimates of slippage / discards. **FCI comment: Further consultation with both the Norwegian Institute of Marine Research and Marine Scotland (Science) confirms that the level of observer coverage has been low, but that this is due to the perception of these being lower risk than other pelagic fisheries (for the reasons outlined above). Neither have immediate plans to increase observer coverage in this fishery. A further statement has been added to recommendation 2 (in relation to observers) that “inherent in this recommendation is the understanding that SPSG vessel must always accept reasonable requests to place observers on board vessels”.**

It is important that this fishery be monitored closely in the future for continued certification. Precautionary and limit reference points are not well defined for Atlanto-Scandian herring and have been referred to an ICES methods working group. The precautionary nature of the management plan is questionable given probable increases in TACs in future years. **FCI comment: The surveillance audit will indeed monitor this closely.**

Appendix 5 – Client Action Plan

It should be noted that no conditions are placed on the certification of the SPSG Atlanto Scandian Herring fishery, therefore there are no binding requirements placed upon the client to take action within a specified time frame. Below is a statement of clients action, in relation to the non-binding recommendations raised in this report.

The Scottish Pelagic Sustainability Group (SPSG) is committed to ensuring that this fishery is operated and managed responsibly, as a result the SPSG proposes the following action in response to the points raised in this assessment paying particular attention to the recommendations as shown in Section 8 of the report.

Under conditions of certification, SPSG has introduced a discard/slippage recording system for its North Sea herring and Western mackerel fisheries. Discards and slippage are not features of the SPSG Atlanto-Scandian herring fishery; however consideration will be given to extending the system to include this fishery when the system is next reviewed.

Similarly, SPSG is about to introduce a reporting protocol for reporting interactions with endangered, threatened and protected species and will include the Atlanto-Scandian herring fishery in this process although, again, there is no history of such interactions in this fishery.

SPSG will continue to actively engage with Marine Scotland Science (MSS) and co-operate with the MSS observer programme.

Agreed by Derek Duthie on behalf of SPSG

A handwritten signature in black ink, appearing to read 'Derek Duthie', is written over a horizontal line.

23rd October 2009