DNV·GL

MSC FISHERY ASSESSMENT REPORT

Final report Reassessment of the Norway North Sea and Skagerrak herring fishery

REPORT NO. 2013-008

REVISION NO. 01 – DATE 23.04.2014

DET NORSKE VERITAS AS
Veritasveien 1, 1322 HØVIK, Norway Tel: +47 67 57 99 00 Fax: +47 67 57 99 11
http://www.dnv.com

MSC FISHERY ASSESSMENT REPORT

DATE OF FIRST ISSUE:	PROJECT NO.:
10.02.2014	PRJC-160926-2009-MSC-NOR
DET NORSKE VERITAS	ORGANISATIONAL UNIT: DNV GL Business Assurance
CLIENT: Norges Fiskarlag	CLIENT REF.: Jan Birger Jørgensen

Project Name: Norway North Sea and Skagerrak herring

Certificate no.: DNV-NOR-MSC-F-61406-2009
Certificate date: 17 September 2009
Valid until: 29 July 2014

Determination Phases/Type of report:

☐ Preliminary Draft Report (Client's review)
☐ Peer Review Report
☐ Public Comment Draft Report (Stakeholders review)
☒ Final Report
☐ Public Certification Report

The objective of this project has been the reassessment of the Norway North Sea and Skagerrak Herring fishery caught by purse-seine and pelagic trawl.

Report No.:	Date of this revision:	Rev. No.
2013-008	23.04.2014	01

Report title:
Reassessment of the Norway North Sea and Skagerrak herring fishery

Work carried out by :

- Mr. John Nichols, Expert for Principle 1, Team leader (stage 4-7)
- Ms. Sandhya Chaudhury, Team Leader (stage 1-3), MSC Chain of Custody Lead Auditor (stage 1-3), DNV GL
- Dr. Stephen Lockwood, Expert for Principle 2
- Dr. Geir Hønneland, Expert for Principle 3
- Dr. Guro Meldre Pedersen, Team member, DNV GL, MSC Chain of Custody (stage 4-7)

Work verified by:

MSC FISHERY ASSESSMENT REPORT

Table of Contents

Glossary 5
List of symbols & reference points 7
List of fish species 8
1 Executive Summary 9
1.1 The Assessment team 9
1.2 Assessment timeline 9
1.3 Scores for separate principles 9
1.4 Main strengths and weaknesses of the client's operation 10
1.4.1 Strengths 10
1.4.2 Weaknesses 11
1.5 Determination with supporting rationale 11
1.6 Conditions for certification and time-scale for compliance 12
2 Authorship and Peer Reviewers 13
2.1 Assessment team 13
2.2 Peer reviewers 14
3 Description of the Fishery 16
3.1 Unit(s) of Certification and scope of certification sought 16
3.1.1 Unit of certification 16
3.1.2 Scope of Assessment in Relation to Enhanced Fisheries 17
3.1.3 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF) 17
3.1.4 Scope of Assessment in Relation to Inseparable or Practically Inseparable (IPI) stocks 17
3.2 Overview of the fishery 18
3.2.1 Client name and contact information for the assessed fisheries 18
3.2.2 Client information 18
3.2.3 The Norway North Sea and Skagerrak herring fishery 19
3.3 Principle One: Target Species Background 23
3.3.1 Biology and life history 23
3.3.2 Stock status and stock assessment 27
3.3.3 Fishery management plans and annual advice 34
3.4 Principle Two: Ecosystem Background 42
3.4.1 The Ecosystem 42

3.4.2 Capture of non-target species in the Norway North Sea & Skagerrak herring fishery 49
3.5 Principle Three: Management System Background 64
4 Evaluation Procedure 67
4.1 Harmonised Fishery Assessment 67
4.2 Previous assessments 73
4.3 Assessment Methodologies 75
4.4 Evaluation Processes and Techniques 79
4.4.1 Site Visits 79
4.4.2 Consultations 83
4.4.3 Evaluation Techniques 84
4.4.4 Risk based framework 85
5 Traceability 86
5.1 Eligibility Date 86
5.2 Traceability within the Fishery 86
5.3 Eligibility to Enter Further Chains of Custody 87
5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody 88
6 Evaluation Results 89
6.1 Principle Level Scores 89
6.2 Summary of Scores 89
6.3 Summary of Conditions 92
6.3.1 Recommendations 92
6.4 Determination, Formal Conclusion and Agreement 92
6.5 Changes in the fishery prior to and since Pre-Assessment 92
References 93
Appendices 100
Appendix 1 Scoring and Rationales 100
Appendix 1.1 Performance Indicator Scores and Rationale 100
Appendix 2. Peer Review Reports 221
Peer reviewer 1 221
Peer reviewer 2 236
Appendix 3. Stakeholder submissions 249
Appendix 3.1: Stakeholder submissions to Public comment draft report 249
Appendix 4. Surveillance Frequency 253
Appendix 5. Client Agreement 254
Appendix 5.1 Objections Process 255

Appendix 6: List of vessels in the coastal group engaged in the Skagerrak Herring fishery in 2012 256

Appendix 7: List of vessels in the coastal group engaged in the North Sea Herring fishery in 2012 257

Appendix 8: List of vessels in purse seiner group engaged in the Skagerrak Herring fishery in 2012 259

Appendix 9: List of vessels in purse seiner group engaged in the North Sea Herring fishery in 2012 260

Appendix 10: List of vessels in trawl group engaged North Sea Herring fishery in 2012 263

Appendix 11: List of vessels in SUK group engaged in North Sea herring fishery in 2012. 264

Appendix 12: Variation request and Variation response IPI stock 265

Appendix 13 Details of scoring for the compared assessments 270

Glossary

ACOM	(ICES) Advisory Committee on Management
ADAPT	Fishery stock assessment method
AGSE	Joint ICES/OSPAR Ad hoc Group on Seabird Ecology
CRISP	Centre for Research-based Innovation in Sustainable fish capture and Pre-processing technology, at IMR, Norway
DNV	Det Norske Veritas
DoF	Directorate of Fisheries, Norway
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened and protected species
EU	European Union
FAM	Fisheries Assessment Methodology
FNI	Fridtjof Nansen Institute
ICES	International Council for the Exploration of the Sea
IMR	Institute for Marine Research (Havforskninsinstituttet), Norway
IWC	International Whaling Commission
JNRFC	Joint Norwegian- Russian Fisheries Commission
KLIF	Norwegian Climate and Pollution Agency
MFCA	Ministry of Fisheries and Coastal Affairs
MP	Management plan
MSC	Marine Stewardship Council
MSVPA	multi-species virtual population assessment
NAMMCO	North Atlantic Marine Mammal Commission
NE	North East
NEA	North East Arctic
NEAFC	North East Atlantic Fisheries Commission
NEZ	Norwegian Economic Zone
NFA	Norwegian Fishermen's Association (Norges Fiskarlag)
NFVOA	Norwegian Fishing Vessel Owners Association (Fiskebåtredernes Forbund)
NGO	Non – Governmental Organization
NINA	Norwegian Institute for Nature Research
NPI	Norwegian Polar Institute
NS	North Sea
NSC	Norwegian Seafood Council
OSPAR	Oslo and Paris Commission for the protection and conservation of the North-East Atlantic and its Resources
PCDR	Public Comment Draft Report
PI	Performance Indicator
PISG	Performance Indicator Scoring Guidepost

RAC	Regional Advisory Council
ROV	Remotely operated vehicle
RSW	Refrigerated seawater
SAM	Space Assessment Model
SG	Scoring Guidepost
SMH	Sensitive Marine Habitats
TAC	Total Allowable Catch
UK	United Kingdom of Great Britain and Northern Ireland
VPA	Virtual population analysis
WBSSH	Western Baltic spring-spawning herring stock
WGECO	Working Group on Ecosystem Effects of Fishing Activities
WGMME	(ICES) Working Group on Marine Mammal Ecology
WGSAM	Working Group on Multispecies assessment Methods
WRS	Winter ringers
WWF	World Wide Fund for Nature

List of symbols & reference points

B_{lim}	Minimum biomass below which recruitment is expected to be impaired or the stock dynamics are unknown.
B_{msy}	Biomass corresponding to the maximum sustainable yield (biological reference point); the peak value on a domed yield-per-recruit curve.
B_{pa}	Precautionary biomass below which SSB should not be allowed to fall to safeguard it against falling to Blim.
$B_{trigger}$	Value of spawning stock biomass (SSB) that triggers a specific management action
F	Instantaneous rate of fishing mortality
F_{lim}	Exploration rate that is expected to be associated with stock 'collapse' if maintained over a longer time (precautionary reference point).
F_{max}	F where total yield or yield per recruit is highest (biological reference point)
F_{mp}	Management plan target fishing mortality
F_{msy}	F giving maximum sustainable yield (biological reference point).
F_{pa}	Precautionary buffer to avoid that true fishing mortality is at Flim when the perceived fishing mortality is at Fpa.
MSY	Maximum Sustainable Yield
SSB	Spawning stock biomass
SSB_{mp}	Management plan target SSB

List of fish species

Common name	Latin name
Blue fin tuna	*Thunnus thynnus*
Blue whiting	*Micromesistius poutassou*
Cod	*Gadus morhua*
Common dab	*Limanda limanda*
Dover sole	*Solea solea*
Golden redfish	*Sebastes marinus*
Haddock	*Melanogrammus aeglefinus*
Hake	*Merluccius merluccius*
Halibut	*Hippoglossus hippoglossus*
Herring	*Clupea harengus L.*
Horse mackerel	*Trachurus trachurus*
Lemon sole	*Microstomus kitt*
Long rough dab	*Hippoglossoides platessoides*
Mackerel	*Scomber scombrus*
Norway pout	*Trisopterus esmarki*
Pilchards	*Sardina pilchardus*
Plaice	*Pleuronectes platessa*
Pollack	*Pollachius pollachius*
Porbeagle shark	*Lamna nasus*
Red mullet	*Mullus surmuletus*
Saithe	*Pollachius virens*
Sandeels	*Ammodytes marinus*
Sea bass	*Dicentrarchus labrax*
Silvery pout	*Gadiculus argenteus*
Sprat	*Sprattus sprattus*
Spurdog	*Squalus acanthias*
Whiting	*Merlangius merlangus*

1 Executive Summary

This report provides information on the re-assessment of the Norway North Sea and Skagerrak herring fishery, caught by purse seine and pelagic trawl.

The client for this certification is the entire Norwegian fleet represented by Norges Fiskarlag (Norwegian Fishermen's Association, NFA).

The report is prepared by Det Norske Veritas Certification AS. The assessment team used the default assessment tree as defined in the MSC Certification requirements v1.3.

1.1 The Assessment team[1]

Ms. Sandhya Chaudhury	Team Leader (stage 1-3) MSC Chain of Custody Lead Auditor (stage 1-3), DNV GL
Mr. John Nichols	Expert for Principle 1, Team leader (stage 4-7)
Dr. Stephen Lockwood	Expert for Principle 2
Dr. Geir Hønneland	Expert for Principle 3
Dr. Guro Meldre Pedersen	Team member, DNV GL, MSC Chain of Custody (stage 4-7)

1.2 Assessment timeline

Announcement of re-assessment:	2 April 2013
Site Visit and Stakeholder Consultation:	24-25 June 2013
Expected Date of Re-Certification:	29 July 2014
Actual Eligibility date::	

1.3 Scores for separate principles

Table 1 Principle-level scores for the Norway North Sea and Skagerrak herring fishery

Final Principle Scores		
Principle	**Purse seine**	**Pelagic trawl**
Principle 1 – Target Species	96,3	96,3
Principle 2 – Ecosystem	94,3	94,7
Principle 3 – Management System	96,1	96,1

[1] Changes in assessment team announced at MSC website: http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/norway-north-sea-and-skagerrak-herring/re-assessment-downloads

1.4 Main strengths and weaknesses of the client's operation

1.4.1 Strengths

- The Norway North Sea and Skagerrak herring fishery is a well-managed fishery with broad stakeholder involvement.

- A management plan, which underpins the harvest strategy, was established in 1998 and revised in 2008. The plan has remained unchanged since 2008 and is clearly achieving its objectives with fishing mortality defined as 'below limit', SSB above the management plan and MSY trigger levels since 2008 and the stock maintains full reproductive capacity.

- The basic biology and stock structure and dynamics of the North Sea autumn spawning herring has been the subject of considerable research for well over one hundred years. As a result the seasonal distribution, spawning areas and geographic range is very well known and described in the scientific literature.

- Changes to the assessment model in 2012 changed the perception of stock status and increased the estimates of SSB dating back over the whole time series. The new model does provide 95% confidence intervals on the estimates of SSB. The estimates at the lower confidence interval provide confidence, and a high degree of certainty, that the stock has been fluctuating around its target reference point or been above it in recent years

- The reference points meet internationally agreed standards and have been endorsed by ICES as consistent with a precautionary approach to managing the stock

- There are numerous stock management plans, rules and tools (TAC, quotas, minimum mesh & fish sizes, mesh and grid regulations, real-time closures) in place that are expected to maintain the retained species at levels that are highly likely to be within biologically based limits; the quantities caught in the NS&SH fishery will ensure the fishery does not hinder any stock recovery or rebuilding, including the Western Baltic Spring Spawning Herring fishery (WBSSH). The operational strategy is to minimise the capture of non-target species at all times while the administrative strategy is to collect accurate and verifiable data in support of the appropriate stock assessment and to ensure that each stock is managed in accordance with its national and, or internationally agreed management plan.

- All commercial fish species must be retained, recorded and landed.

- For purely commercial reasons, skippers wish to minimise the capture of non-target species at all times. Data collected from the observer fleet illustrate that the operational measures adopted are successful in meeting the skippers' objective.

- Pelagic gears avoid seabed contact at all cost and purse seines are only brought into contact with smooth sedimentary seabed where they will have minimal effect. To do anything else risks damage that could incur great cost in repairing the purse seine.

Consequently, it is universally accepted that pelagic gears are the least likely of all fishing methods to have any adverse effect on seabed habitat structure or function.

- The reference-fleet observer programme provides sufficient detail to assess whether or not there is any significant change in catch composition of characteristics that might possibly have meaningful implications for the status of bycatch species.

1.4.2 Weaknesses

- Whilst the tools in use are very effective in controlling the exploitation rate on the North Sea autumn spawning stock there is no clear evidence that they achieve an effective exploitation rate on the vulnerable Western Baltic spring spawning component (WBSSH). There is some uncertainty regarding the actual quantities of spring spawners taken in this fishery in the Skagerrak, Kattegat and north eastern North Sea. The problem is further complicated by the variable transfer of TAC from ICES Division IIIa into a transfer area in the north eastern North Sea. The catches of WBSSH are all estimated and allocated on the basis on post hoc biological sampling and analysis of otolith microstructure rather than straightforward species identification and recording at the time of capture.

- In addition to monitoring the numbers of seabird and marine mammal interactions aboard the reference fleet, the total populations of these groups across Norwegian waters are also monitored by NINA and IMR, respectively, and fishery effects assessed. The same if true for critical red-list fish species such as spurdog and *Sebastes marinus* but stock status of other red-list (elasmobranch) fish is not monitored to the same degree, principally because catch numbers are too low. In the event that their populations, and catches, were greater than is currently the case, the same conservation strategy would presumably be applied in full, e.g catch-level threshold and move-on policy, area closures, stock assessments. The same will only become true for seabirds and marine mammals once the elogbook recording system is fully operational and producing verifiable information. Thus, overall, information is sufficient to measure trends and support a strategy that is less than comprehensive with respect to birds and mammals even though there is no evidence that the fishery is having a discernible effect on any ETP species or population.

- Mechanisms to support people dependent on fishing for food and livelihood are not legally formalized and can be abolished as a result of changes in political priorities.

1.5 Determination with supporting rationale

The Norway North Sea and Skagerrak herring fishery achieved a score of 80 or more for each of the three MSC Principles, and did not score under 60 for any of the set MSC Criteria. The assessment team therefore recommends the recertification of the Norway North Sea and Skagerrak herring fishery for the client Norway Fishermen's Association (Norges Fiskarlag).

1.6 Conditions for certification and time-scale for compliance

The Norway North Sea and Skagerrak herring fishery did not achieve a score below 80 against any of the scoring indicators; hence no conditions were set for the certification of the fishery.

2 Authorship and Peer Reviewers

2.1 Assessment team[2]

The evaluation has been performed by the following team:

Mr. John Nichols	Expert for Principle 1, Team leader (stage 4-7)
Ms. Sandhya Chaudhury	Team Leader (stage 1-3) MSC Chain of Custody Lead Auditor (stage 1-3), DNV GL
Dr. Stephen Lockwood	Expert for Principle 2
Dr. Geir Hønneland	Expert for Principle 3
Dr. Guro Meldre Pedersen	Team member, DNV GL, MSC Chain of Custody (stage 4-7)

Sandhya Chaudhury (Team Leader and Lead Auditor, DNV Certification AS): B.Sc., MBA. Sandhya Chaudhury has been the Lead Auditor for various MSC Pre- and Full Assessments since 2005. She has participated in various MSC workshops introducing certification methodology for MSC Fisheries and Chain of Custody to workshop participants. Sandhya has auditor experience with other quality management standards since 2002 and industry experience since 1991.

Mr. John Nichols (independent expert): Mr John Nichols is a retired UK government fisheries biologist with 42 years research experience in plankton ecosystems in the North Atlantic specializing in the taxonomy of North Atlantic & NW European plankton including phytoplankton, micro and meso-plankton, ichythoplankton and young fish.He has been a member of ICES working groups on herring, mackerel, horse mackerel, sardine and anchovy assessments; and mackerel and horse mackerel egg surveys. He was also a member of ICES study groups on herring larval surveys and plankton sampling. He was scientist in charge of numerous research vessel surveys for fish stock assessment purposes and directly involved in the assessment of pelagic and western demersal fish stocks from 1994 to 2000. Since retirement from his government post he has participated in numerous MSC assessments as the Principle 1 expert. The assessments include the Thames estuary herring, PFA North Sea Herring, Hastings Fleet Dover sole, the north–east coast of England bass fishery, the SW mackerel handline fishery re assessment, the Norwegian pelagic fisheries, Newfoundland herring, Pacific sablefish, the Norwegian saithe fisheries and a North Sea plaice fishery. He has also been a peer reviewer for numerous MSC reports.

Dr. Stephen Lockwood (independent expert): Stephen Lockwood is an independent marine environment consultant with over 40 years' experience of marine fishery and environmental research and management. From 1967 to 1999 he was a government fishery scientist at the Fishery Laboratory (now Cefas) Lowestoft and then Conwy, North Wales. His research

[2] Changes in assessment team announced at MSC website: http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/norway-north-sea-and-skagerrak-herring/re-assessment-downloads

covered fishery coastal ecology, stock assessment and management, and fishery interests in coastal zone management. As a consultant he has prepared environmental impact assessments for a variety of coastal and offshore developments and contributed both as an assessor and peer reviewer for numerous UK, European and North American fisheries seeking MSC certification.

Dr. Geir Hønneland (independent expert): Geir Hønneland is a Research Director of the Fridtjof Nansen Institute and adjunct professor at the University of Tromsø, Norway. He holds a Ph.D in political science from the University of Oslo, speaks Russian fluently and has followed the developments of Russian fishery politics and the Barents Sea fisheries management for more than two decades. Among his books are *Implementing International Environmental Agreements in Russia* (Manchester University Press, 2003), *Russian Fisheries Management: The Precautionary Approach in Theory and Practice* (Martinus Nijhoff, 2004), and *Making Fishery Agreements Work: Post-Agreement Bargaining in the Barents Sea* (Edward Elgar, 2012). He was member of the assessment team that performed the first MSC assessment of the Russian Barents Sea cod and haddock fishery in 2010. Dr. Hønneland also has wide range of evaluation experience, e.g. for the FAO relating to the FAO Code of Conduct for Responsible Fisheries.

Guro Meldre Pedersen (Team leader trainee, DNV Certification AS): MSc, PhD.
Guro Meldre Pedersen has been supporting the MSC programme since 2010 as Global Seafood Coordinator within DNV, and is currently in the process of qualifying for Team Leader for the MSC Fishery programme.

2.2 Peer reviewers

Based on experience with the relevant MSC Fishery programme and components of the Unit of Certification, the following peer reviewers were selected:

Peer Reviewers:

Dr. David Bennett. David Bennett has 45 years experience in fisheries research, specialising in the biology, population dynamics, and assessment of commercially exploited fish and shellfish stocks, the provision of national and international fisheries management advice, and fisheries aspects of environmental impact studies. He chaired the ICES Working Group on Nephrops stocks, has been a member of a number of ICES Working and Study Groups, and an expert for the EU Commission. As a consultant he has undertaken a number of fisheries and environmental projects. More recently he has been a member of the MSC teams that assessed the UK NESFC Lobster and Bass fisheries and the Loch Torridon Nephrops Creel Fishery. He has peer reviewed the original Loch Torridon assessment, Burry Inlet Cockles, Vietnamese Ben Tre Clams, North Sea Nephrops and Haddock trawl fisheries, Stornoway Nephrops, Clyde Nephrops creel fishery, Bristol Channel Sea Bass, Tristan da Cunha rock lobsters, Faroese and Estonian NE Arctic Prawns, and Russian Barents Sea Cod and Haddock.

Dr. Massimiliano Cardinale. Dr Cardinale has experience in marine fisheries stock assessment and management, with more than 15 years of professional experience in fisheries ecology and more than 10 years in the field of management of fisheries at national, regional and global levels. He has 15 years' experience at the Swedish National Board of Fisheries and Swedish University of Agricultural Sciences as responsible for the assessment of the most important stocks of the North and Baltic Sea. His activities include modelling, statistical analysis, stock assessment and advice. Dr. Cardinale has several years'

experience in Asia and in Africa under different SIDA projects. He is member of ACOM (under ICES) and STECF (under DG-MARE at EU commission) committees for fisheries and marine resource management since 2002. He has participated in more than 40 different working groups under ICES and more than 20 under DG MARE, and has chaired more than 10 different working groups under ICES and DG MARE umbrella. In 2011, he was invited as reviewer at the STAR panel of the Joint US-Canada Technical Review Panel for the Pacific Hake/Whiting Stock Assessment by the Centre for Independent Expert (CIE). Dr Cardinale has been nominated official member of the Editorial Board of the International Journal of Applied Ichthyology and ISRN Oceanography. He has produced more than 70 publications in international journals and more than 50 working reports.

3 Description of the Fishery

3.1 Unit(s) of Certification and scope of certification sought

3.1.1 Unit of certification

According to the MSC Certification Requirements v1.3, the proposed unit of certification shall include the target stock (s), the fishing method or gear and the practice (including vessels) pursuing that stock.

The MSC Certification Requirements Guidance V1.3 specifies 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 that stock".* According to this definition, the re-assessment report addresses two units of certification to maintain certificate of compliance which were issued following the initial certification.

The unit of certification for the Norway North Sea and Skagerrak herring fishery is defined as:

Species:	Herring (*Clupea harengus*)
Geographical range of fishing operations:	North Sea and Skagerrak; ICES Division IV and IIIa; within EEZ of Norway.
Method of capture:	Pelagic trawl and purse-seining (scored separately)
Stock:	North Sea herring stock
Management	The stock is managed according to EU-Norway Agreement. This agreement is implemented in Norway under National management systems, advised by ICES.
Client group	Norwegian vessels that are part of the Norwegian quota and sales are through Norges Sildesalgslag. Certification is controlled by the client Norges Fiskarlag.

The entire Norwegian fleet in the defined geographical areas has been included in the unit of certification. No other eligible fishers have been identified.

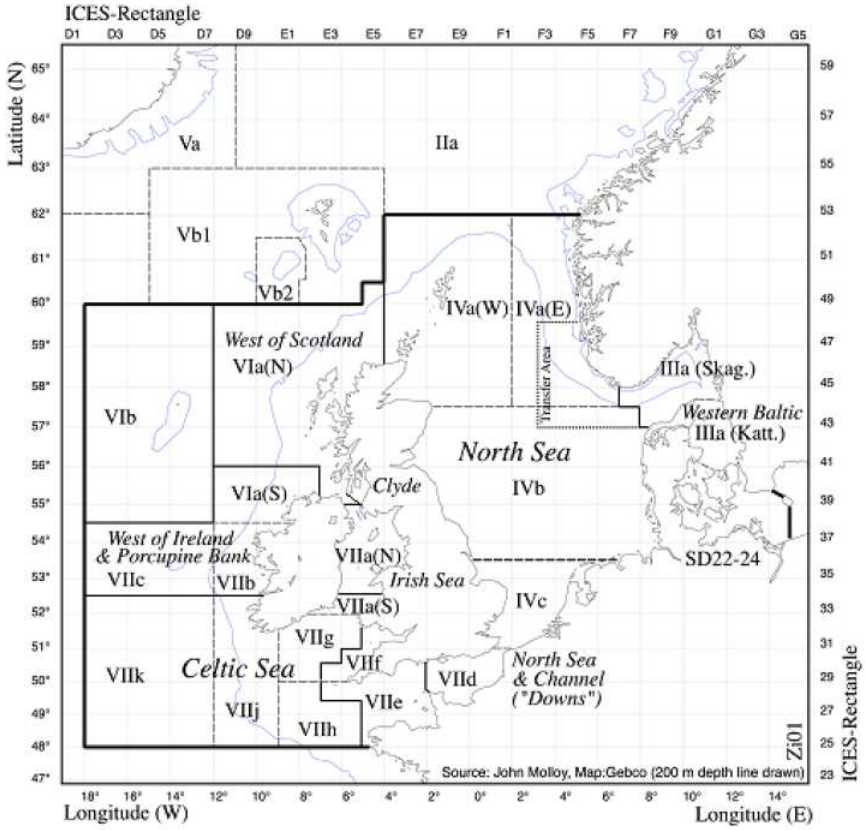


Figure 1 ICES areas as used for the assessment of herring stocks south of 62°N. Area names in italics indicate the area separation applied to the commercial catch and sampling data kept in long term storage. "Transfer area" refers to the transfer of Western Baltic Spring Spawners caught in the North Sea to the Baltic Assessment (HAWG, 2013).

3.1.2 Scope of Assessment in Relation to Enhanced Fisheries

From the information gathered during the assessment there are no indications of enhancement in this fishery.

3.1.3 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The Norway North Sea and Skagerrak herring fishery is not based on introduced species.

3.1.4 Scope of Assessment in Relation to Inseparable or Practically Inseparable (IPI) stocks

Western Baltic spring spawning herring (WBSSH) can be defined as IPI catches, as they are practically inseparable from the target stock of North Sea herring during normal fishing operations, they comprise less than 15% of the overall catch (<1.5% average over period 2010-2012), they are not certified separately and they are not ETP species. Detailed information about the WBSSH is available in section 3.4.2.1 Retained fish species. For

information about eligibility of IPI stock(s) to Enter Further Chains of Custody, please see section 5.4.

3.2 Overview of the fishery

3.2.1 Client name and contact information for the assessed fisheries

Norges Fiskarlag replaced Norges Sildesalgslag as responsible client for the Norway North Sea and Skagerrak herring fishery as announced 16 May 2013 on the MSC website.

Client name: **Norges Fiskarlag**
Contact person: Jan Birger Jørgensen
Address: Postbox 1233 Sluppen
Pirsenteret, 7462 Trondheim, Norway
Telephone: + 47 73 54 58 50 / +47 930 44 346
Email: fiskarlaget@fiskarlaget.no / jan.birger.jorgensen@fiskarlaget.no

3.2.2 Client information

Norges Fiskarlag (Norwegian Fishermen's Association / NFA) was established in 1926 as an interest group for the hitherto unorganized Norwegian fishermen. The main focus was better control of the fish brought to shore and improved working conditions in the high-risk profession. As a direct result of the organization's efforts, the Raw Fish Act was introduced in 1938, ensuring the fishermen a minimum price for fish delivered.

The NFA's most important objective is to organize all professional Norwegian fishermen, and the activities embrace the political, economic, social and cultural fields of interest to its members, as well as other matters more or less directly connected to their fishing activities. The organisation is a politically independent, national organisation based on voluntary membership of fishermen via their county associations and group organizations. The highest governing body of the NFA is its Congress, which consists of 69 delegates, elected by the seven county associations and two group organizations which together constitute NFA. The Congress meets biannually. Intermediate authority is exercised by the National Committee that comprises of 14 members chosen from the member organisations and elected by the Congress. The main office in Trondheim is staffed by approximately 20 people, including the General Secretary, Assistant General Secretary and sections for areas of specific interest including resource management.

The NFA organizes both owners of fishing vessels and fishermen working on a share or percentage basis. The organization today represents about 25% of the registered Norwegian fishermen. NFA coordinates MSC Fisheries certification processes for the following fisheries on behalf of the entire Norwegian fleet:

- North East Arctic Cod
- North East Arctic Haddock
- North East Atlantic mackerel
- **North Sea and Skagerrak Herring**

- Norwegian Spring Spawning Herring
- North East Arctic Saithe
- North Sea Saithe
- North East Arctic Cold Water Prawn

3.2.3 The Norway North Sea and Skagerrak herring fishery

In the past the North Sea herring fishery has had a poor record of unaccounted mortality through area misreporting and under-reporting of catches and clandestine landings. The 2013 assessment working group (ICES, 2013a) reported the substantial decline in area misreporting in most recent years and comment that most of the unaccounted mortality in the stock has been reduced if not eliminated. This welcome change can be attributed to more rigorous enforcement, new national legislation and also to a more enlightened attitude on the part of the industry as a whole.

Slippage and high grading in the herring fisheries is now prohibited in EU waters (EC Council Reg. 43/2009) provided that the fish are above the legal minimum size (20cm Regions 1-5; 18cm Skagerrak and Kattegat) and that quota is available. There are also some seasonal and area closures to protect spawning areas which have a good record of compliance.

With the cessation of the Scottish pelagic observer programme in 2011 there is now no quantifiable information on discarding rates at all. Rates of discarding previously reported were in the range of 10 to 100 tonnes. This was always considered to be an underestimate because it was from a single national fleet. However, with the new regulation in force the general level of discarding in this fishery is considered to be low (ICES, 2013a).
Some unaccounted mortality is likely to occur through on board catch processing from, for example, the flushing of the refrigerated seawater tanks and net cleaning. Little information is currently available on this potential source of unaccounted mortality but it is not considered to be significant.

For the assessment in 2013 the Working Group's estimation of the actual catch was virtually the same as the official landings. Table 2 shows the record of compliance with the agreed TACs over the period 2006 to 2012. This table shows the ICES assessment Working Groups' estimate of catch, which is based on confidential information obtained by Working Group members, and the Official record of landings.

For 2012 the total TAC was agreed, in line with the Management Plan, at 405,000t for fleet A which included the sub-TAC of 44,600t for IVc/VIId. An additional by-catch ceiling of 17,900t was agreed for fleet B which comprises all by-catches in other fisheries in ICES Sub-area IV and Divisions VIId and IIIa. TACs were also agreed for the catches of herring taken in directed fisheries (fleet C) and by-catches (fleet D) in Division IIIa. Catches in this area were likely to include some North Sea autumn spawners. These details for the period 2006 to 2012 are given in Table 2.

Table 2 ICES assessment Working Groups' estimate of catch and the Official record of landings over the period 2006-2012.

	2006	2007	2008	2009	2010	2011	2012
TAC Fleet 'A' '000t HC	455	341	201	171	164	200	405
Official landings HC Fleet A '000t	478	354	219	157	166	209	414
Working group catch HC Fleet A '000t	498	381	236	156	166	209	414
Excess of landings over TAC (HC)	43	40	35	0	1	9	9
By-catch ceiling Fleet 'B' '000t	42	32	19	16	14	17	17.9
Reported by-catches Fleet 'B' '000t	12	7	9	10	9	9	10.6
Working group catch North Sea '000t	511	388	245	166	175	218	424.6
Divisions IVc/VIID Sub TAC '000t	50	37.5	26.7	23.6	15.3	26.5	44.6
Total catch divisions IVc/VIId '000t	56.6	39	29.6	21.9	26.5	26.7	40.4

The total catch of all herring in the North Sea and eastern English Channel in 2012 was 424,600t of which 10,600t was allocated to the by-catches fleet 'B' TAC which was well below the by-catch ceiling set by the EU at 17,900t for the 2012 fishery. The total catch allocated to the 'A' fleet was therefore 414,000t which was only a 2% overshoot of the agreed TAC (405,000t). A total of 12,200t of North Sea autumn spawning herring were taken in Division IIIa in 2012 which was an increase of 45% over the catch in 2011 (8,400t). The catch of western Baltic spring spawners taken in the North Sea increased from 308t in 2011 to 2,100t in 2012.

The catch of herring from IVc/VIId in 2012 was 40,400t which was below the area sub-TAC of 44,600t. As in 2011 this area sub-TAC appears to have been respected which contrasts favourably with the large overshoot of this ring-fenced quota in 2010. The sub-TAC was established to protect this vulnerable component of the North Sea stock.

The total recorded landings of North Sea autumn spawning herring in all areas for the period 1947 to 2012 is shown in Figure 2. This shows the fluctuating fortunes of this fishery over that period which are described in more detail, up to 2000, by Nichols (Nichols, 2001). Briefly, after landings increased to over a million tonnes in 1965 there was a stock collapse resulting in a moratorium on all directed herring fisheries in the North Sea between 1977 and 1981. Landings subsequently increased as the stock improved but this was followed by a period, in the mid 1990's, when management action had to be taken to prevent a further collapse. The most recent decline in landings is linked to the succession of below average recruitment to the stock.

To calculate the total catch of North Sea autumn spawners in all areas the ICES Herring Assessment Working Group have to apportion the Western Baltic spring spawners, taken in the North Sea and the North Sea autumn spawners taken in Division IIIa. This results in a total catch of all North Sea autumn spawning herring in 2012 of 434,710t (Table 3). The annual occurrence of Western Baltic spring spawners in the catches from the eastern North Sea is dependent on the variable migration of 2+ winter ring fish into the North Sea to feed. The low catch rates are almost certainly a reflection of the continuing poor recruitments to that stock.

Table 3 Total catch of all North Sea autumn spawning herring in 2012.

Fishing Area	Catch in 2012 fishery
North Sea autumn spawners in the North Sea and VIId	422,500t
North Sea autumn spawners in the Division IIIa	12,200t
Western Baltic spring spawners in the North Sea	2,100t
Coastal type spring spawners	100t
Total catch of North Sea Autumn spawners	**434,700t**

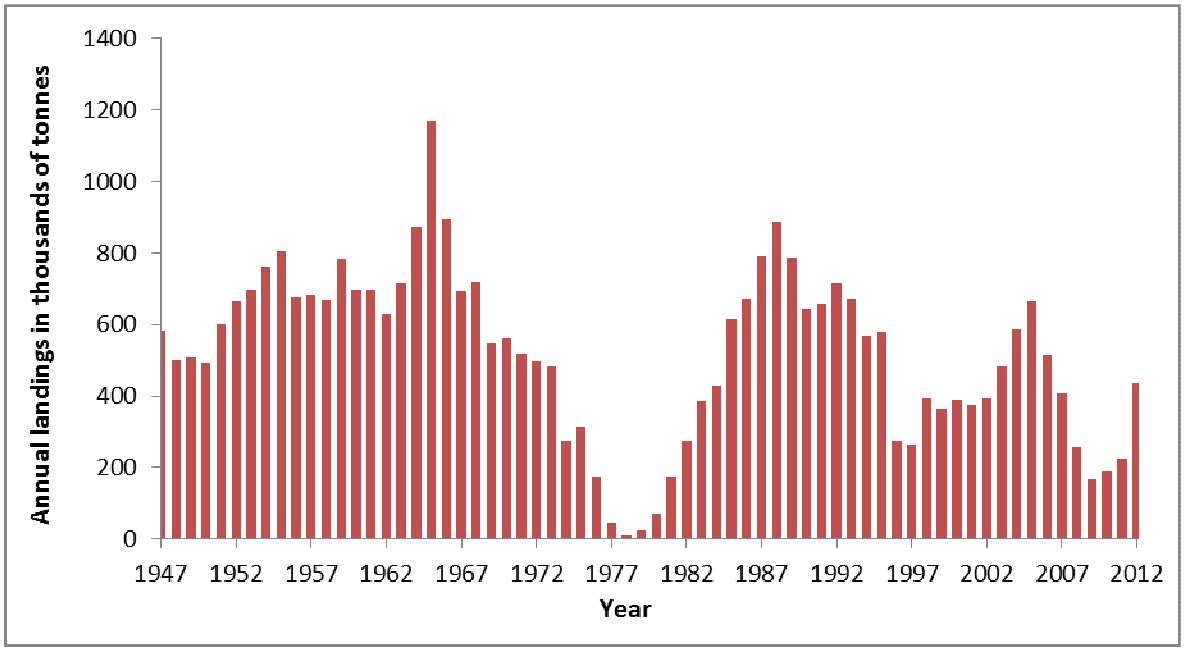


Figure 2 Annual landings of North Sea autumn spawning herring (all areas) for the period 1947 to 2012 (Data source: ICES, 2013b).

Figure 3 shows the national pattern of landings of herring from the North Sea and eastern English Channel in 2012 (i.e. not the total North Sea autumn spawners) This pattern has remained largely unchanged over recent years with Norway and Denmark dominating the landings with 28% and 25% of respectively. The Netherlands and the UK took 17% and 15% respectively of the landings in 2012.

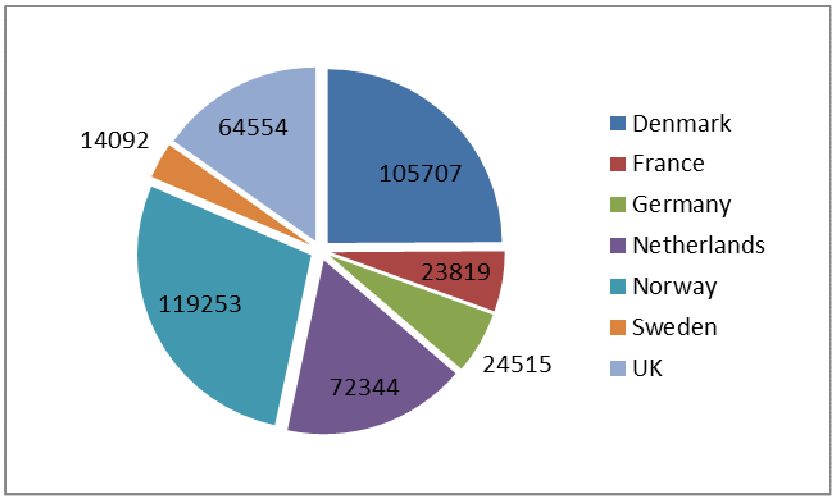


Figure 3 The landings in tonnes of herring from the North Sea and English Channel by each of the participating countries in 2012.

3.3 Principle One: Target Species Background

3.3.1 Biology and life history

The Atlantic herring (*Clupea harengus*) is a member of the Clupeidae family of pelagic fishes which includes sprats, pilchards, anchovies and shads. The herring is a pelagic species which is widespread in its distribution throughout the shelf sea areas of the temperate North Atlantic. It occurs off Norway, around Iceland, Greenland and off the east coast of the USA and Canada as well as in the North Sea. It is also found throughout the Baltic. The stocks in these different areas are quite distinct, have different migration routes and separate spawning areas. Some of those stocks spawn in the autumn and winter whilst others spawn in the spring. The herring in the North Sea are mainly autumn / winter spawners whilst off Norway and in the Baltic they spawn in the spring. The herring's unique habit, amongst commercial fish species, is that it produces benthic eggs which are attached to the seabed in suitable areas of gravely substrate or on fjord edges off the Norway coast and even in shallow eel grass (*Zostera*) beds in the Baltic. This is a limiting factor in terms of the available spawning areas and increases the potential for detrimental anthropogenic effects on spawning success, such as bottom trawling, sand and gravel dredging and seismic surveying.

Both spring and autumn spawning herring do occur in the North Sea and Skagerrak but the major fisheries are carried out on the offshore autumn spawning fish. The spring spawners are found mainly as small discrete coastal groups in areas such as The Wash and the Thames estuary. Juveniles of the western Baltic spring-spawning stocks may also be found in the eastern North Sea as well as Norwegian coastal spring spawners. Individuals of spring and autumn spawning stocks can be identified by the analysis of the otolith microstructure. This skilful and time consuming process has to be carried out on small samples from the fisheries where autumn and spring spawners are taken together in the catches. The potential mix of different spawning groups, resulting in mixed catches in the fisheries, adds a complexity to the management of herring fisheries which is uncommon for most other species.

The main autumn spawning begins in the northern North Sea in August and progresses steadily southwards through September and October in the central North Sea to November and as late as January / February in the southern North Sea and eastern English Channel. The widespread but discrete location of the herring spawning grounds throughout the western North Sea has been well known and described since the early part of the 20th Century. This led to considerable scientific debate and eventually to investigation and research on stock identity. The controversy centred on whether or not the separate spawning grounds represented discrete stocks or 'races' within the North Sea autumn spawning herring complex. Resolution of this issue became more urgent as the need for the introduction of management measures increased during the 1950's. The International Council for the Exploration of the Sea (ICES) encouraged tagging and other racial studies and a review of all the historic evidence to resolve this problem. The conclusions were reviewed by Harden Jones (1968) and formed the basis for establishing the working hypothesis that the North Sea autumn spawning herring comprise a complex of three separate stocks each with separate spawning grounds, migration routes and nursery areas.

The three North Sea stock units (Figure 4) are:

- **The Buchan or Scottish group** which spawn from July to early September in the Orkney Shetland area and off the Scottish east coast. Nursery areas for fish up to two years old are found along the east coast of Scotland and also across the North Sea and into the Skagerrak and Kattegat.
- **The Banks or central North Sea group**, which derive their name from their former spawning grounds around the western edge of the Dogger Bank. These spawning grounds have now all but disappeared and spawning is confined to small areas along the English east coast, from the Farne Islands to the Dowsing area, from August to October. The juveniles are found along the east coast of England, down to the Wash, and also off the west coast of Denmark and in the Skagerrak.
- **The Downs group** which spawns in very late autumn through to February in the southern Bight of the North Sea and in the eastern English Channel. The drift of their larvae takes them north-eastwards to nursery areas along the Dutch coast and into the German Bight.

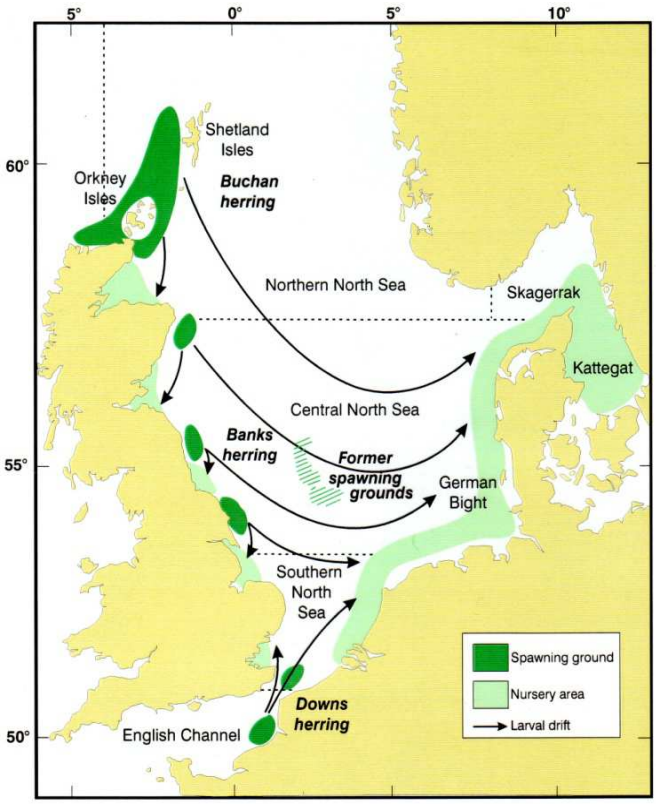


Figure 4 The Spawning areas, nursery areas and drift of the juvenile herring of the three North Sea groups: the Buchan, Banks and Downs spawners (Nichols,2001)**.**

At certain times of the year, individuals from the three stock units may mix and are caught together as juveniles and adults but they cannot be separated in the commercial catches. As a consequence, North Sea autumn spawning herring have to be managed as a single unit, although the Downs group is recognised as having different characteristics and attempts are made to give it special protection by separating the management advice and an area sub-TAC.

3.3.1.1 Fecundity and early life history

The fecundity of herring is length/weight related and over the whole of the North Sea varies generally between approximately 10,000 and 140,000 eggs per female although values as high as 175,000 have been recorded (Burd and Howlett, 1974). Herring eggs take from two to three weeks to hatch dependant on temperature. The larvae are planktonic and passively drift for around three to four months during which time they drift to various coastal nursery areas on both sides of the North Sea and into the Skagerrak and Kattegat (Figure 4).

3.3.1.2 Age determination

In the past, herring age has been determined by using the annual rings on the scales. Since the late 1970's the growth rings on the otolith have proved more reliable for age determination. Herring age is expressed as number of winter rings on the otolith rather than age in years as for most other commercial teleost species where a nominal 1 January birth-date is applied. Autumn spawning herring do not lay down a winter ring during their first winter and therefore remain as '0' winter ringers until the following winter. Spring-spawners do lay down a ring in their first winter.

3.3.1.3 Maturity

The age of first maturity in the North Sea is 3 years old (2 winter ringers, wrs) but the proportion mature at age may vary from year to year dependent on feeding conditions and year class strength. The recent sequence of poor year classes is reflected in the proportions mature at age with those poor year classes growing faster and maturing earlier. The proportion mature at age has a very direct impact on the estimate of SSB and can introduce an area of uncertainty. Maturity values over the past fourteen years, showing the percentage mature at age are shown in Table 4 below.

Table 4 The percentage of North Sea herring mature at age for the years 1999 to 2012 (Data source: ICES, 2013a).

Year/wr	2wr	3wr	4wr	5+wr
1999	81	91	100	100
2000	66	96	100	100
2001	77	92	100	100
2002	86	97	100	100
2003	43	93	100	100
2004	70	65	100	100
2005	76	97	96	100
2006	66	88	98	100
2007	71	92	93	100
2008	86	98	99	100
2009	89	100	100	100
2010	45	90	100	100
2011	87	84	99	100
2012	91	99	100	100

The maturity ogive is updated annually from sampling during the acoustic surveys. The low proportion of the very large 2000 year class as 2 wrs in 2003 (43% mature) and as 3 wrs in 2004 (65%.mature) clearly demonstrates the effect of year class strength on maturity. The proportion of two winter ringers mature in 2011 was above the average of recent years whilst

the proportion of 2 and 3 winter ringers mature in 2012 was very high. This is almost certainly a reflection of the continuing below average recruitment to the stock. For the assessment of stock status only the most recent maturity observations are used. The justification for using a single year's data was described fully in the assessment working group report in 1996 (ICES, 1996).

3.3.1.4 Feeding and growth

Herring continue to feed mainly on planktonic animals throughout their life history although there are numerous records of them taking small fish, such as sprat and sandeels, on an opportunistic basis. Calanoid copepods, such as *Calanus, Pseudocalanus and Temora* and the Euphausids, *Meganyctiphanes* and *Thysanoessa* form the major part of their diet during the spring and summer.

Table 5 Mean stock weights (gms) from sampling on the acoustic survey in ICES Divisions IVa, IVb and IIIa in the 3rd quarter of the year for 1-9+ winter ringers (wr) for the period 1996 to 2009. The highlighted values show the progression of the 2000 year class (Source: ICES 2013a)).

wr's / Year	1	2	3	4	5	6	7	8	9+
1996	45	119	196	253	262	299	306	325	335
1997	45	120	168	233	256	245	265	269	329
1998	52	109	198	238	275	307	289	308	363
1999	52	118	171	207	236	267	272	230	260
2000	46	118	180	218	232	261	295	300	280
2001	50	127	162	204	228	237	255	286	294
2002	45	138	172	194	224	247	261	280	249
2003	46	104	185	209	214	243	281	290	307
2004	35	116	139	206	231	253	262	279	270
2005	43	135	171	181	229	248	253	274	295
2006	45	127	158	188	188	225	243	244	265
2007	66	123	155	171	204	198	218	247	233
2008	62	141	180	183	194	230	217	268	282
2009	56	148	208	236	232	240	266	249	261
2010	38	138	183	229	245	233	237	252	251
2011	35	151	171	210	242	258	249	252	275
2012	48	125	192	194	212	232	242	239	243

The stock weights of herring are recorded annually both from the acoustic survey and from the catches. Sampling is carried out in ICES Divisions IVa, IVb and IIIa, in the third quarter of the year, when most fish are approaching their peak weights prior to spawning. These data are used in the annual stock assessment process and subsequent predictions for the stock. In 2012 the mean weight at age in the stock was lower for age groups 2wrs and 4wrs and above but was higher for age groups 1wr and 3wr compared with the previous assessment. These patterns were reasonably consistent in both the catch and acoustic survey data. Variation in size at age can largely be explained by density dependent mechanisms but is also influenced, to a degree, by environmental effects (Dickey-Collas, 2010). The strong 2000 year class (highlighted in Table 5) was competing with a large herring stock biomass and as a consequence was slow growing throughout its lifetime.

3.3.2 Stock status and stock assessment

From 1972 to 1995 the assessment of the North Sea autumn spawning herring stock was done by means of a virtual population analysis (VPA) model with ad hoc tuning to a series of larvae production estimates, acoustic surveys and trawl surveys (Nichols, 2001). During the early1990s there was increasing uncertainty about the assessment which led to the exploration of other assessment models. The uncertainty was generated by serious differences in the perception of stock size between the various survey indices. In 1995 the assessment working group decided to change to an integrated catch analysis (ICA) method (Patterson, 1998) for the assessment of the stock in 1994. The ICA model has been used for the North Sea herring assessment each year since 1995. Subsequently this model became widely used for most of the pelagic stocks assessed by ICES including the North East Atlantic mackerel stock. In spite of some computational difficulties it was generally accepted as an appropriate procedure for the assessment of pelagic stocks, indeed the assessment of the North Sea autumn spawning herring stock has been recognised inside ICES as one of the best and most consistent assessments. (Simmonds, 2009).

During 2011 it became apparent that there were unresolved issues with the ICA model and it could no longer be supported within the ICES assessment framework. It was accepted that it would have to be replaced prior to the planned benchmark assessment for herring in 2012. In February ICES convened a Benchmark Workshop on Pelagic stocks, WKPELA,(ICES, 2012c). Its remit was to determine and review the appropriate stock assessment methods for five pelagic stocks which included North Sea herring.

The Workshop carried out a thorough examination of all the input parameters for the North Sea herring assessment. They also explored the suitability of other modelling procedures and data selection. Their deliberations and conclusions are comprehensively detailed in section 5 of the report (ICES, 2012c). These include the exploration of all the potential data sources not only those currently in use. Briefly the Workshop recommended a change to the state – space assessment model (SAM) as an ideal framework to replace the ICA model. This has also resulted in changes to the input data including a return to using the whole time series of landing information dating back to 1947.

The listed main features of the SAM model of importance are:

- SAM is a fully statistical model. All data are treated as observations and missing data are handled gracefully.
- SAM offers a fully statistical framework that can be used as the basis for model refinement and decision-making.
- Uncertainties are generated for all estimated parameters.
- SAM internally estimates the precision of each data source and uses this estimate to weight them appropriately in the optimized model.
- SAM is a framework rather than a model– it is highly flexible with a low number parameters and can readily be modified to the peculiarities of the given stock.
- SAM is open source and cross platform software. As a result, customisations of the source-code to deal with issues are feasible

The ICES Herring Assessment Working Group meeting in March 2012 accepted the recommendations of the benchmark workshop on pelagic stocks (ICES, 2012a) for the benchmark assessment of North Sea herring in 2012. As a result the tool used for the

assessment was the FLSAM, an implementation of the State-space assessment model (www.stockassessment.org) embedded inside the FLR library (Kell et. al 2007).

All the changes to input data are described and explained in the assessment working group report (ICES, 2012a). Amongst the many improvements was the use of the whole time series of data back to 1947. The new model also provides 95% confidence intervals on the estimation of SSB, F and recruitment. Another improvement of note is the integration of fundamental links between the North Sea ecosystem and the stock dynamics of the autumn spawning herring. The assessment now includes variable estimates of natural mortality (M) at age derived directly from a multispecies stock assessment model, the SMS model, used in WGSAM (ICES, 2011b; Lewy and Vinther, 2004).

3.3.2.1 Fisheries independent indices used in the assessment

The annual stock assessment is supported by a number of fishery independent surveys which provide indices of the abundance of various year classes in the stock. There are two main surveys providing independent estimates of the abundance of age groups 0-6 winter ringers in the stock.

An acoustic survey in the summer was started in 1979 and extended to cover the Skagerrak and Kattegat in 1989. The 2012 survey covered the area north of latitude 52^{o}N in the North Sea and produced an index of North Sea autumn spawners of 2.3 million tonnes. This was 7% lower than the index for the previous year. It is recognised that there are some potential problems in relation to survey catchability at age and to spatial distribution of mature fish. These sources of uncertainty are kept under constant review by the assessment working group (ICES, 2013a).

An international bottom trawl survey in the first quarter of the year was started in 1996 and now produces indices of 1 winter ring and 2-5 winter ring fish from the trawl hauls. The survey also generates an index of '0' group fish from a concurrent fine meshed net survey which is used as a recruitment index for the stock. The 2012 recruitment index, from the 2013 survey, was lower than the 2011 index and was 46% of the long term mean recruitment.

The 1 winter ring index from the 2013 survey (2011 year class) was 22% higher than the 2010 index and was 89% of the long-term mean value. The 2-5 winter ring index was not used in the stock assessment process either in 2012 or 2013. A decision not to continue using this index was made at the last benchmark assessment in 2012 (ICES, WKPELA, 2012c).

The relationship between spawning stock size and recruitment as '0' winter ringers in the following year is shown in Figure 5 based on the whole time series back to 1947. This relationship remains basically unchanged from previous years. This relationship now includes the period in the 1970s when the whole North Sea stock collapsed, and SSB was below 50,000t. With improved recruitment and the moratorium on directed fishing for herring the stock recovered (The lowest SSB value in the time series was in 1977 (48,000t). This figure has now been revised retrospectively in the 2013 assessment to 126,754t. The lowest SSB in the time series is now 117,005t in 1975).

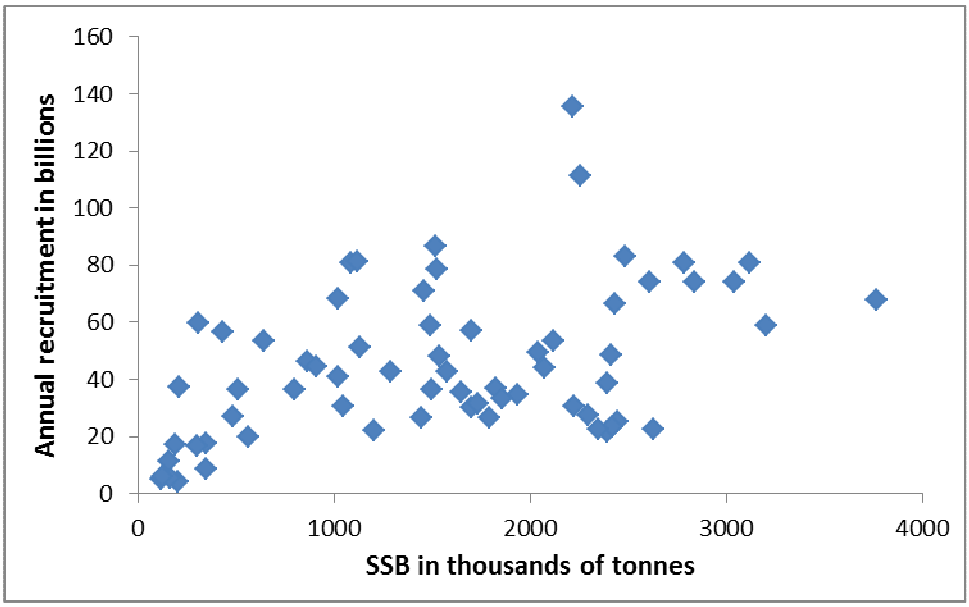


Figure 5 Spawning stock biomass / recruitment relationship from 1947 to 2012. The recruiting year class is plotted against the SSB in the year that they were spawned (Data source: ICES, 2013b)

The other fishery independent survey index is the Multiplicative Larval Abundance index (MLAI) from the larvae surveys. This provides an age aggregated index of spawning biomass and also provides valuable information on the development of the three spawning components. It is based on the abundance of early stage larvae (length<10-11mm) The surveys are carried out, over the spawning grounds, in September in the Orkney Shetland, Buchan and central North Sea areas and in December and the following January in the southern North Sea and eastern English Channel.

In the 2012/2013 surveys the spatial distribution varied considerably between areas and time periods. Compared to the previous year the abundance of newly hatched larvae increased markedly in areas surveyed in September. For example the estimated abundance in the Orkney / Shetland area was the largest observed in the time series dating back over forty years. In sharp contrast the estimated abundance in the central North Sea was very small. Newly hatched Downs larvae in the southern North Sea were also present in historically high numbers which continues the pattern observed over the past six years. Temporal and spatial coverage of the surveys has reduced considerably over the years and does generate uncertainty in the resultant biomass estimates. It also makes direct comparisons between spawning areas almost impossible to achieve.

The procedure for analysing the larval survey data over many years has produced a multiple larval abundance index (MLAI). After the benchmark assessment in 2012 (ICES, WKPELA, 2012c) the procedure was changed to a spawning component abundance index (SCAI), which was developed to better represent the separate development and dynamics of the three spawning components of the North Sea stock (Payne, 2010). The most recent SCAI corresponds to an SSB of 4 million tonnes.

The larval surveys are currently providing little information on the reasons for the succession of below average recruitments to the stock. Generally the relatively high production of

recently hatched larvae in most areas does suggest that the mechanisms must be operating during the later larval or even early post larval stages.

3.3.2.2 The stock assessment

As a result of a change in the assessment model used in 2012 (ICES, 2012a) there was a significant change in the perception of spawning stock biomass (SSB) and fishing mortality (F) over the past twenty years. The 2013 assessment was consistent with the previous year's assessment and the perception of SSB in the most recent years has only been marginally reduced compared with the 2012 assessment (ICES, 2013a). Figure 6 shows the difference in the perception of SSB from the 2011 assessment compared with the 2012 and 2013 assessments for the time series dating back to 1960.

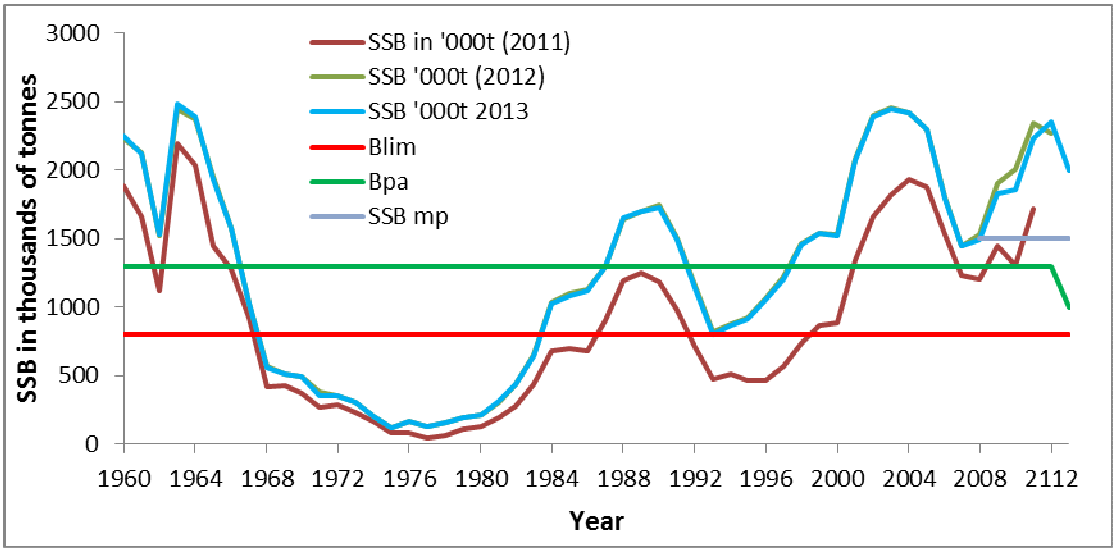


Figure 6 The annual spawning stock biomass over the period 1960 to 2012 as assessed in 2011 (brown), 2012 (pale green) and 2013 (bright blue). The biomass reference points Blim, Bpa and the management plan biomass SSBmp are also shown (Data source: ICES, 2011a, 2012b, 2013a, 2013b).

Figure 7 shows the difference in the perception of F from the 2011 and 2013 assessments over the same time series. There are some significant differences in the perception of fishing mortality on adults (ages 2-6wrs) mainly from the late 1980s through to the early 2000s, in line with the changed perception of SSB. In the 2103 assessment the perception of fishing mortality in 2011 has been revised upwards by 17% compared with the 2012 assessment.

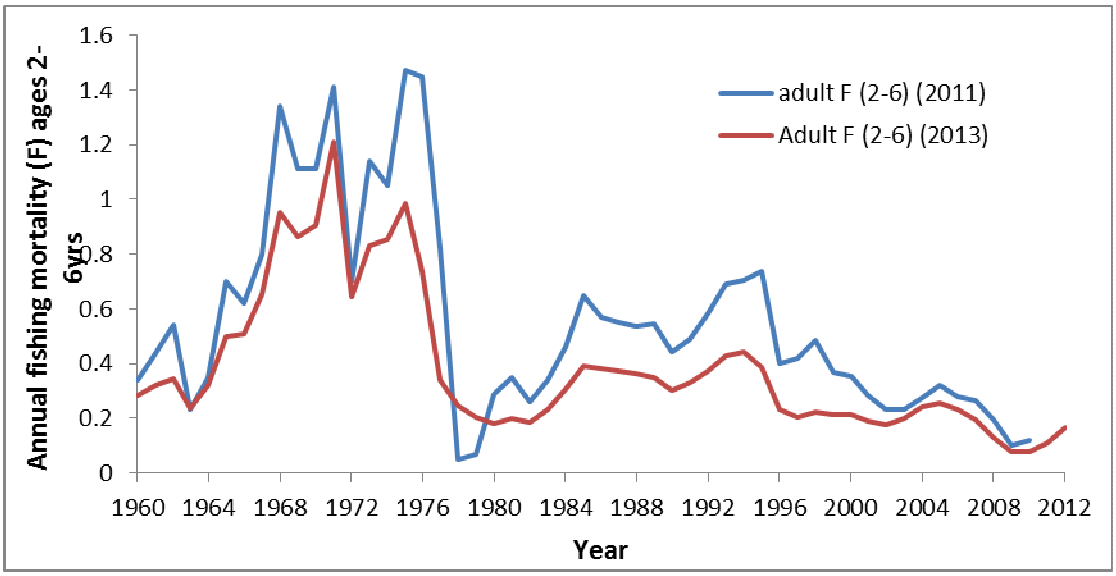


Figure 7 Annual fishing mortality on adults (ages 2-6 winter rings) over the period 1960 to 2012 as assessed in 2011 (blue) and 2013 (red) (Data source: ICES, 2011a, 2013a, 2013b).

The revised assessment of the stock in March 2013 (ICES 2013a) indicated an SSB at spawning time in 2012 of 2.35 million tonnes (Figure 8) which is close to the predicted value of 2.27 million tonnes in the previous assessment. The annual increases in the perception of SSB, as a result of the model change, have averaged 31% over the past ten years with the biggest increase of 54% in 2010. Based on mean recruitment and fishing mortality at the management plan level in 2013, SSB is predicted to fall to about 2.0 million tonnes in 2013, but remains well above B_{pa} and B_{lim}. (Figure 6).

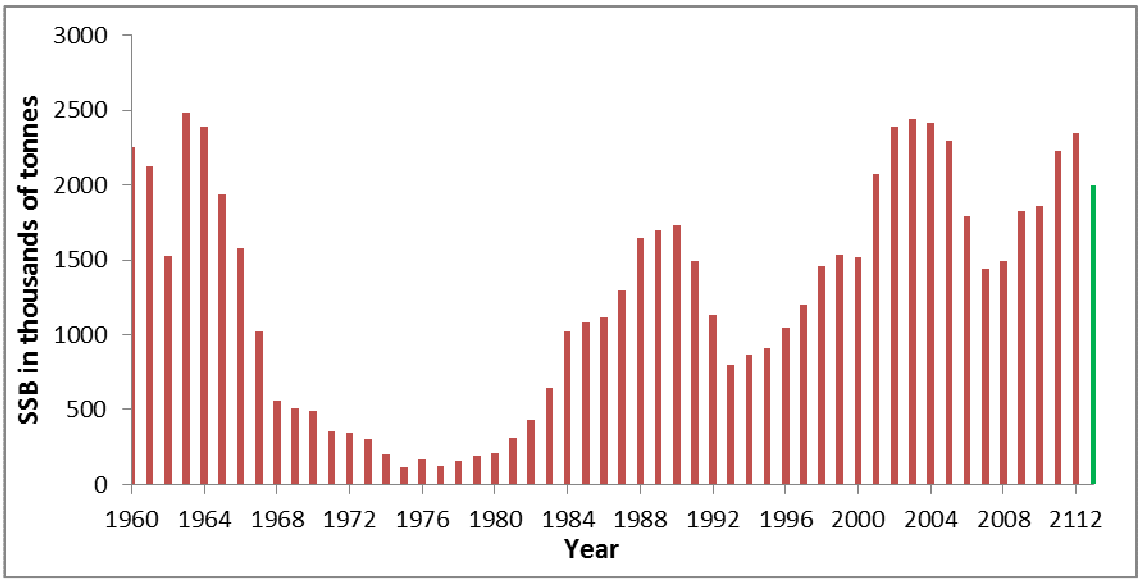


Figure 8 Spawning stock biomass of North Sea autumn spawning herring for the period 1960 to 2012. The predicted value for 2013 (green) is also included (Data source: ICES, 2013b).

The current assessment shows that fishing mortality on the adults has been below Fmsy and Fpa target (F0.25) since 2006. Indeed it has only been marginally above that level in one year, (F0.26) in 2005, over the period dating back to 1996. The perception of fishing mortality on the juveniles, aged 0 to 1 winter ringers (Figure 9) has not shown such significant changes as a result of the new assessment model. Annual fishing mortality on this age group did increase to 0.035 in 2012 but continues to remain below the management plan target level (F0.05) and has only been above that level once, in 2005 (F0.077), since 1999.

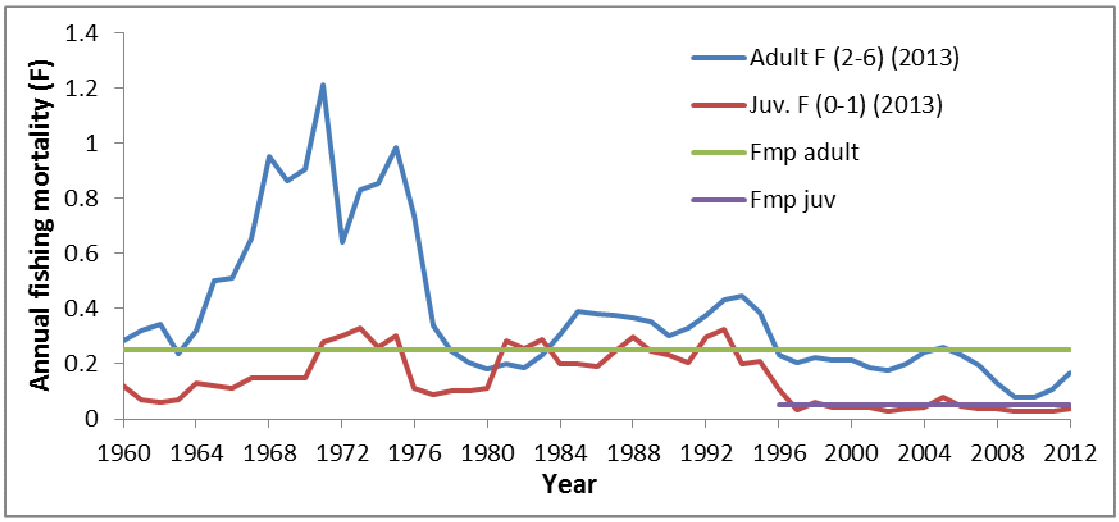


Figure 9 Fishing mortality on North Sea autumn spawners for adults (2-6wrs) and for juveniles (0-1wrs) over the period 1960 to 2012 (Data source: ICES, 2013b).

Figure 10 shows the age composition of the catch as numbers of North Sea autumn spawning herring in 2010, 2011and 2012 from all areas including ICES Division IIIa. The total catch increased in 2012 by 54% to 3.3 billion fish in line with the increased quota. The '0' and '1' winter ring fish comprised 32% of the total catch in numbers in 2012. Most of these are taken by the 'B' fleet in Division IVb where they comprised 57% of the total catch. Some are also taken in the mixed clupeoid fishery, 'D' fleet in Division IIIa. The age composition continues to show a reasonable spread of year classes present in the fishery up to 9+ winter ringers normally considered to be a positive sign. However the last strong year class was in 2000 and these fish are now in the 9+ age group with a succession of below average year classes following it (Figure 11).

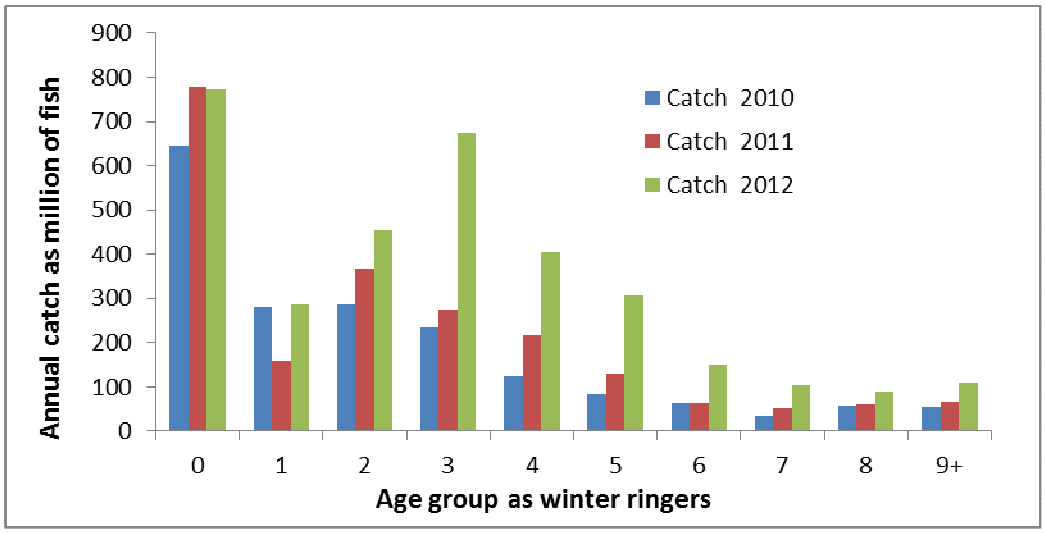


Figure 10 Catch of North autumn spawning herring in 2010 and in 2011as millions of fish in each age group as winter ringers. (Data source: ICES, 2013a).

Based on the most recent estimates of SSB and fishing mortality, ICES classifies the stock as being at full reproductive capacity and is being harvested sustainably. Fishing mortality is below Fmsy targets for both adults and juveniles and in line with the long term management plan. The SSB at spawning time in 2012 was estimated at 2.35 million tonnes which is well above the current biomass precautionary level which has now been reduced to 1 million tonnes (Figure 6). Fishing mortality on adults, based on 2-6 winter ring fish was estimated at F 0.17 in 2012 which is comfortably below the management plan target of F0.25.

Information on the development in North Sea herring recruitment comes mainly from the International Bottom Trawl Surveys, from which '0' and '1' winter ringer indices are available. The new stock assessment model also provides estimates of the recruitment of herring from the catch and from all fishery independent indices and provides an estimate of recruitment for the current year.

Recruitment at age 1 (0 winter ringers) over the period 1947 to 2013 is shown in Figure 11. The estimates of recruitment remain unchanged in the new assessment model. The year classes from 2002 to 2007 are estimated to be among the weakest since the late 1970s. The year classes 2008 and 2009 and 2010 are estimated to be above the short term geometric mean whilst the 2011 year class is below it. The provisional estimate of the 2012 year class ('0'wr in 2013), based on a single survey in 2013, is estimated to be well below the long term mean and probably the second lowest over the past fifteen years. The stock continues to be in a period of low productivity, in terms of recruits per spawner and larval survival, and the sequence of poor recruitments continues. This scenario is probably related to environmental factors, but a plausible explanation remains elusive (Payne et al 2009).

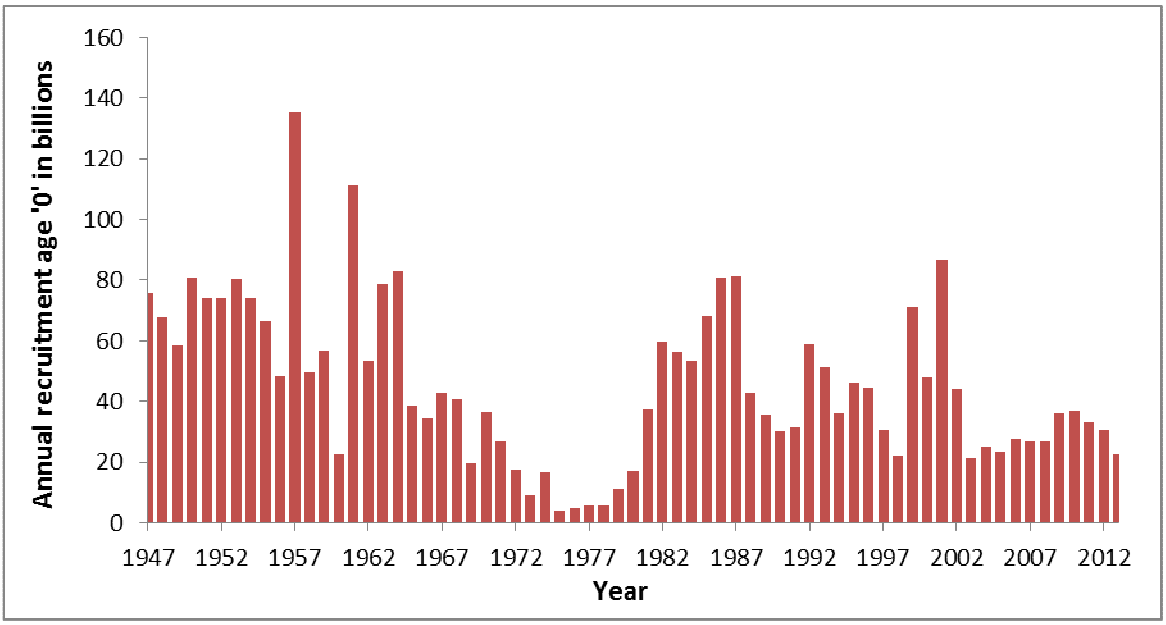


Figure 11 North Sea autumn spawning herring recruitment as billions of '0' winter ring fish in the survey year (i.e. not year class) over the period 1947 to 2013. NB the final year estimate, 2013, is provisional and based only on one year survey data of '0' winter ringers in 2013. (Data source: ICES, 2013b).

3.3.2.3 Summary of the results of the assessment

As noted earlier the model change and changes to the input data have led to changes in the historic perception of both SSB and F. The absolute estimates of SSB are now generally higher throughout the time series, fishing mortality is lower but the trends remain similar. The estimates of recruitment have not changed.

The 2013 estimate of SSB at spawning time in 2012 was 2.35 million tonnes. The 95% confidence interval on that estimate was 1.96 – 2.80 million tonnes. This compares favourably with the predicted value of 2.27 million tonnes in 2012 (ICES, 2012b).
The estimate of '0' winter ring fish in 2013 (2012 year class) is estimated at approximately 22.5 million fish (95% CI 12, - 42.3 million) which is just below the geometric mean of the time series.

Fishing mortality on the adults, aged 2-6 winter ringers was estimated at F0.17 (95% CI; 0.13 - 0.22) which is below the management plan target F0.25). The fishing mortality on the juveniles, aged 0 to 1 winter ringers was estimated at F0.035, which was also below the management plan target of F0.05.

3.3.3 Fishery management plans and annual advice

Following the stock collapse in the mid 1970's and the resultant moratorium on directed herring fisheries in the North Sea strict management measures were introduced before the fishery was re-opened in 1981. These included control of total landings by international quotas, a ban on the industrial fishery for juvenile herring and a limit on the proportion of juvenile herring in the small meshed sprat fisheries in the North Sea. A minimum biologically acceptable level of spawning stock was set at 800,000t. After a subsequent near collapse of

the stock in the early 1990's, when the SSB appeared to have fallen below 500,000t further strict management measures were introduced which included a halving of the TAC.

The current management plan is the result of a process that began in the mid-1990s as a result of the near collapse of the stock and stemmed from negotiations between the EU and Norway in 1997 (ICES, 2011c). The key elements in this plan were a fishing mortality set separately for adult and juvenile herring (at 0.25 and 0.12 respectively) and a trigger biomass (1.3 million tonnes) below which the fishing mortalities should be reduced. The target fishing mortalities were decided based on extensive simulations (Patterson et al., 1997) to find the level of sustainable exploitation of adults and juveniles that resulted in a low risk of bringing SSB below 800 000 tonnes, which was the minimum biological acceptable level (MBAL) at the time. When ICES introduced precautionary reference points in its advisory practice, the MBAL level was adopted as Blim and the trigger biomass of 1.3 million tonnes as Bpa. The target fishing mortalities in the harvest rule were adopted as Fpa. The harvest rule was amended in 2004. The amendments included specific rules to apply when SSB is below 1.3 million tonnes and a constraint on TAC change from year to year (ICES, 2011c). Some revisions were made to the harvest control rule in 2005 (ICES, 2005) and again in 2008 in response to reduced recruitment.

In 2008 the ICES workshop on herring management plans met in February 2008 WKHMP (ICES, 2008) and carried out extensive investigations of the harvest control rule and the relevance of the reference points. The investigations, which involved extensive simulations, lead to a recommended change in the management plan which was endorsed and agreed by the EU and Norway in November 2008 to become the new management plan for North Sea autumn spawning herring which came into force on 1 January 2009. The revised management plan represented a new approach to management based on regulating fishing mortality in order to ensure a low risk (<5% probability) of SSB being below the point at which recruitment would be impaired (Blim). The previous management strategy was based on maintaining SSB above a precautionary level (Bpa) set to ensure that at that level there was a low risk of SSB actually being below Blim. These reference points no longer provide guidance to management actions according to the state of the stock. They are now solely used to classify the state of the stock and rate of exploitation according to precautionary limits. The new management plan also introduced a new biomass trigger point at 1.5 million tonnes. This point, together with the Blim trigger point, serves to provide three potential management scenarios in the management plan dependent on the state of the stock. Each management scenario has different management target fishing mortalities (Fmp) for adults (ages 2-6wr) and juveniles (ages 0-1wrs) associated with the overall objectives of the harvest rule. One important point in the management plan is the limit on changes in the annual TAC of +/- 15% unless all parties agreed to invoke clause 6 which permits a reduction of >15%.

The agreed Management Plan and was evaluated by ICES who concluded that it is consistent with both the precautionary and MSY approaches. Although an MSY biomass has not been specifically defined, ICES have defined the MSY fishing mortality consistent with the management plan upper trigger biomass of 1.5 million tonnes. The plan implies a low risk of SSB being below Blim even if other reference points may be exceeded occasionally. It is important to note that the management plan has primacy over the ICES MSY framework when providing advice. ICES accepts that this may lead to conflicting classification of the status of the stock, a discrepancy which currently remains unresolved.

Analysis carried out during the benchmark assessment in 2012 (ICES, WKPELA, 2012c) implied that the current reference points may have changed as a result of the changed perception of the stock following the change in assessment model. As a result the EU / Norway formulated a request to ICES to evaluate the precautionary and limit reference points as well as re-evaluating the precautionary management plan designs (ICES, WKHELP, 2012d). Briefly, the only changes made to the reference points to date are a reduction in the biomass precautionary approach point from 1.3Mt to 1.0Mt. Blim remained unchanged and the precautionary approach fishing mortality, Fpa is no longer considered relevant and is not defined.

3.3.3.1 Agreed Management Plan for North Sea herring

According to the EU–Norway agreement (November 2008):

1. Every effort shall be made to maintain a minimum level of Spawning Stock Biomass (SSB) greater than 800,000 tonnes (Blim).
2. Where the SSB is estimated to be above 1.5 million tonnes the Parties agree to set quotas for the directed fishery and for by-catches in other fisheries, reflecting a fishing mortality rate of no more than 0.25 for 2 ringers and older and no more than 0.05 for 0 - 1 ringers.
3. Where the SSB is estimated to be below 1.5 million tonnes but above 800,000 tonnes, the Parties agree to set quotas for the direct fishery and for by-catches in other fisheries, reflecting a fishing mortality rate on 2 ringers and older equal to: 0.25-(0.15*(1,500,000-SSB)/700,000) for 2 ringers and older, and no more than 0.05 for 0 - 1 ringers.
4. Where the SSB is estimated to be below 800,000 tonnes the Parties agree to set quotas for the directed fishery and for bycatches in other fisheries, reflecting a fishing mortality rate of less than 0.1 for 2 ringers and older and of less than 0.04 for 0-1 ringers.
5. Where the rules in paragraphs 2 and 3 would lead to a TAC which deviates by more than 15 % from the TAC of the preceding year the parties shall fix a TAC that is no more than 15 % greater or 15 % less than the TAC of the preceding year.
6. Notwithstanding paragraph 5 the Parties may, where considered appropriate, reduce the TAC by more than 15 % compared to the TAC of the preceding year.
7. By catches of herring may only be landed in ports where adequate sampling schemes to effectively monitor the landings have been set up. All catches landed shall be deducted from the respective quotas set, and the fisheries shall be stopped immediately in the event that the quotas are exhausted.
8. The allocation of the TAC for the directed fishery for herring shall be 29 % to Norway and 71 % to the Community. The by catch quota for herring shall be allocated to the Community.
9. A review of this arrangement shall take place no later than 31 December 2011.
10. This arrangement enters into force on 1 January 2009.

The advice for the management of the fishery in 2012 (ICES 2012b**)** continued to use the parameters of the 2008 management plan and also provided a series of options ranging from ‘no fishing’ to following the MSY framework for fishing mortality. This provided a series of catch options for fleet A ranging from zero to 478Kt with a fleet B by catch ceiling of 17.9Kt. The resultant values for SSB in 2013 ranged from 1.8Mt to 2.6Mt.

The eventual agreed TAC for fleet A was 405Kt with a by catch ceiling, fleet B of 17.9Kt. This was based on the MSY fishing mortality of F0.25 which generated a TAC which was 103% higher than the previous year. This was consistent with the management plan when the SSB is above 1.5Mt but was not consistent with clause 5 of the management plan which does not permit increases >15% over the TAC of the previous year.

3.3.3.2 The review of the Long-Term Management plan for North Sea herring

ICES convened a Workshop in March 2011 (ICES, 2011c) to answer a specific request from the EU and Norway on the future of the long-term management plan for North Sea autumn spawning herring (ICES, 2011d). That Workshop concluded that the plan continued to be consistent with the MSY and precautionary approaches. The main weakness in the plan at that time appeared to be the 15% constraint on inter-annual variation in the TAC which was unnecessarily restrictive. The workshop firmly stated that the 'development of management plans' was the way forward to the rational exploitation of the North Sea herring resource. The Workshop recommended that a further review of the current plan should be carried out during 2011 prior to the EU/ Norway negotiations, in December 2011, on the management of North Sea herring in 2012. The recommended review had not taken place prior to the provision of advice by ICES, in May 2012, for the management of the fishery in 2013 (ICES, 2012b).

As requested by the EU / Norway, formal discussions on a further revision of the current management plan eventually began in September 2012. An ICES workshop, on the revision of long term management plans, WKHELP (ICES, 2012d) was convened. The Workshop involved not only a team of experts but also included the participation of industry representatives.

For North Sea herring the Workshop accepted that a full revision of the current management plan was needed. This was particularly urgent because of the changed perception of the stock both in terms of SSB and F following the change of assessment model for the 2012 assessment of stock status in 2011. The Workshop re-evaluated the reference points and concluded that Blim should remain unchanged at 800,000t but Bpa should be revised to 1million tonnes. Fmsy (ages 2-6) should be within the range F0.24-0.30.

The Workshop explored a series of options all based on providing some stability in the annual TAC variability whilst maintaining a low risk (<5% probability) of the SSB being below Blim. The options explored and the results and conclusions are described in detail in the Workshop report (ICES, 2012d) and in ICES advice on the special request for options to revise the long term management plan for North Sea herring (ICES, 2012e).

The report of the Workshop and the subsequent ICES advice was considered at the EU / Norway meeting in January 2013. They have made a further detailed request to ICES that the long term management plan shall be evaluated with and without inter annual quota flexibility of +/- 15% when the SSB is above $B_{trigger}$ scheme as described in Annex VIII of their Agreed Record. ICES is requested to evaluate two very specific alternative plans detailed in that Agreed Record.

It is accepted that there will have to be further discussions based on the ICES response to the EU / Norway request before a revision of the long term management plan for North Sea herring can be agreed and implemented.

3.3.3.3 Reference Points

Table 6 The origin, type, values and technical basis for the agreed reference points for North Sea autumn spawning herring in Sub-area IV and Divisions IIIa and VIId.

	Type	Value	Technical basis
Management plan		F_{0-1} = 0.05 F_{2-6} = 0.25	If SSB >SSBmp upper trigger of 1.5mt (based on simulations)
		F_{0-1} = 0.05 F_{2-6} = 0.25 – (0.15*(1,500,000-SSB) /700,000	If SSB between SSB mp triggers 0.8 and 1.5 million t (based on simulations)
		F_{0-1} = 0.04 F_{2-6} = 0.10	If SSB < SSBmp lower trigger of 0.8 million t (based on simulations)
MSY Approach	MSY B trigger	Not defined	
	Fmsy	0.27 (0.24 – 0.3)	Stochastic simulations with Beverton and Holt and Ricker stock recruitment curve
Precautionary Approach	Blim	800,000t	Level below which poor recruitment has been experienced
	Bpa	1.0Mt	Based on a 5% risk of falling below Blim (CV from SAM assessment
	Flim	Not defined	
	Fpa	Not defined	

3.3.3.4 The advice for the fishery in 2013

In the absence of a review and any changes to the long term management plan the advice for the fishery in 2013 (ICES, 2012b) continued to be firmly based on the parameters of the 2008 management plan. The advice is provided as the usual series of fleet-wise options. The resultant predictions (Table 7) for 2013 are based on a catch constraint in 2012 for fleet A, and for fleet B assuming the same proportion of the by catch ceiling that is taken in 2011. Recruitment for 2012 is 27.7 billion '1'year old fish.

Table 7 Predictions for 2013 for fleet categories A-D (weights in 1000 tonnes).

F fleet A	F fleet B	F fleet C	F fleet D	F_{0-1}	F_{2-6}	Catch fleet A	Catch fleet B	Catch fleet C	Catch fleet D	SSB 2012
0.181	0.026	0.001	0.006	0.03	0.118	423.5*	9.7	7.6	1.6	2271

*Includes a transfer of 50% of the Norwegian quota in Division IIIa to the A-fleet and an additional 50% of the remaining Division IIIa TAC from the C-fleet to the A-fleet.

The management option table showing all the potential combinations of catches for the various fleets catching North Sea autumn spawning herring is below. The specific details of fishing mortality or catch for fleets C and D are included in the ICES advice (ICES, 2012b) but are omitted from Table 8.

The five scenarios in Table 8 are based on the interpretation of the management plan and other options across the fleets:

- No fishing;
- The EU–Norway management plan (which invokes the 15% limit on TAC change);
- A roll-over TAC from 2012 to 2013 of 405 kt for the A-fleet;
- The EU–Norway Harvest Control Rule as implemented within the management plan (no restriction on TAC change); this is also the option for FMSY and Fpa;
- A 15% decrease in the A-fleet TAC in 2013.
- Human consumption fishery (fleet A) fishing mortality F0.3

Table 8 Various cenarios of fishing mortality by fleet with the resultant catches and predictions of the SSB of North Sea autumn spawning herring in 2013 and 2013 (weights in 1000 t).

	F fleet A	F fleet B	Total $F_{0\text{-}1}$ Fleets A_D	Total $F_{2\text{-}6}$ Fleets A_D	Catch fleet A	Catch fleet B	SSB 2013	SSB 2014*	% TAC change fleet A ref. 2012
I	0	0	0	0	0	0	2362	2484	-100%
ii	0.220	0.04	0.05	0.22	465.75	14.4	2047	1805	+15%
iii	0.188	0.04	0.05	0.19	405.0	14.4	2088	1884	0%
iv	0.246	0.04	0.05	0.25	514.7	14.4	2013	1742	+27%
V	0.158	0.04	0.05	0.16	344.25	14.4	2129	1965	-15%
vi	0.296	0.04	0.05	0.30	606.2	14.4	1950	1628	+50%

NB catches for fleets C and D are also provided by ICES but not included in this table.

SSB is determined at spawning time and is influenced by fisheries between 1 Jan and spawning time.

*Assumes status quo F from 2013 to 2014.

Fleet definitions:

Fleet A: Directed herring fisheries with purse-seiners and trawlers (32 mm minimum mesh size) in the North Sea. By-catches in the Norwegian industrial fisheries are included.

Fleet B: Herring taken as by-catch in the small-mesh fisheries in the North Sea under EU regulations (mesh size less than 32 mm).

Fleet C: Directed herring fisheries in Skagerrak and Kattegat with purse-seiners and trawlers (32 mm minimum mesh size).

Fleet D: By-catches of herring caught in the small-mesh fisheries (mesh size less than 32 mm) in Skagerrak and Kattegat

3.3.3.5 Agreed TAC for 2013

Until a revised plan has been agreed between the EU and Norway, ICES continued to advise on the basis of the 2008 agreed EU–Norway management plan. Their advice is firmly based on that plan, scenario ii. in the predictions Table above. Their advice is that catches in 2013 should be no more than 480,200 t, including 465, 750 t for the A-fleet and a by-catch limit of 14,400t for fleet B. ICES also advises that no bottom disturbing activities, e.g. aggregate extraction, should occur in areas with spawning grounds during the spawning season and within 1 month before and after this period (ICES 2012c).

The agreed TAC of North Sea autumn spawning herring in 2013 was set following negotiations between the EU and Norway after a meeting of the EU Council of fisheries ministers.

The eventual agreed TAC for North Sea herring in ICES Sub-area IV and Division VIId is 478,000t. This is divided between the EU 339,380t (71%) and Norway 138,620t (29%). The by catch ceiling, fleet B was set at 14,400t.

The 2013 TAC represents an increase of 18% over the 2012 TAC. This again contravenes clause 5 of the long term management plan which does not permit annual changes greater than 15% in the TAC.

3.3.3.6 The advice for 2014 fishery

The advice for 2014 fishery (ICES, 2013b) is on the basis of the agreed EU / Norway management plan**.** The resultant predictions for 2014 are listed in Table 9 below. They are based on a catch constraint in 2013 for fleet A, and for fleet B assuming the same proportion of the by catch ceiling that was taken in 2012. Recruitment for 2013 is 22.5 billion '1' wr fish.

Table 9 Predictions for 2014 for fleet categories A-D (weights in 1000 tonnes).

F fleet A	F fleet B	F fleet C	F fleet D	F 0-1	F 2-6	Catch fleet A	Catch fleet B	Catch fleet C	Catch fleet D	SSB 2013
0.23	0.02	0.01	0.01	0.04	0.24	497.1*	8.6	11.8	2.5	1996

*Includes a transfer of 2095t of the Norwegian quota and 40% of the Division IIIa TAC from the C fleet to the A-fleet.

The management option table showing all the potential combinations of catches for the various fleets catching North Sea autumn spawning herring is below. The specific details of fishing mortality or catch for fleets C and D are included in the ICES advice (ICES, 2013b) but are omitted from Table 10.

The five scenarios in Table 10 are based on the interpretation of the management plan and other options across the fleets:

- No fishing;
- The EU–Norway management plan (which invokes the 15% limit on TAC change).
- A roll-over TAC from 2013 to 2014 of 478 kt for the A-fleet;
- A 15% increase in the A fleet TAC in 2014
- A 15% decrease in the A-fleet TAC in 2014.
- MSY approach Fmsy

Table 10 Various scenarios of fishing mortality by fleet with the resultant catches and the predictions of the SSB of North Sea autumn spawning herring in 2014 and 2015 (weight in 1000t).

	F fleet A	F fleet B	Total $F_{0\text{-}1}$ Fleets A_D	Total $F_{2\text{-}6}$ Fleets A_D	Catch fleet A	Catch fleet B	SSB 2014	SSB 2015*	% TAC change fleet A ref. 2013
1	0	0	0	0	0	0	2101	2183	-100%
2	0.25	0.3	0.05	0.25	470.0	12.4	1780	1508	-2%
3	0.25	0.03	0.05	0.25	478.0	12.4	1774	1498	0%
4	0..29	0.03	0.05	0.30	549.7	12.4	1724	1411	+15%
5	0.21	0.03	0.05	0.21	406.3	12.4	1824	1590	-15%
6	0.27	0.03	0.05	0.27	503.4	12.4	1757	1467	+5%

NB Catches for fleets C and D are also provided by ICES (ICES, 2013b) but not included in this table. For autumn spawning stocks SSB is determined at spawning time and is influenced by fisheries between 1 January and spawning time.
*Assumes the same F in 2015 as 2014

Fleet definitions:

Fleet A: Directed herring fisheries with purse-seiners and trawlers (32 mm minimum mesh size) in the North Sea. By-catches in the Norwegian industrial fisheries are included.

Fleet B: Herring taken as by-catch in the small-mesh fisheries in the North Sea under EU regulations (mesh size less than 32 mm).
Fleet C: Directed herring fisheries in Skagerrak and Kattegat with purse-seiners and trawlers (32 mm minimum mesh size).

Fleet D: By-catches of herring caught in the small-mesh fisheries (mesh size less than 32 mm) in Skagerrak and Kattegat

The TAC s for the 2014 fishery will be discussed and agreed at a joint EU / Norway management meeting towards the end of 2013.

3.3.3.7 Downs herring component

The Sub-area TAC was set up to conserve the spawning aggregation of Downs herring. There are considerable uncertainties concerning recruitment to, and the stock status of, this component of the North Sea herring stock. In response to those uncertainties the HAWG has recommended that the IVc-VIId TAC should be maintained at 11% of the total North Sea TAC (as recommended by ICES). This recommendation should be seen as an interim measure prior to the development of a more robust harvest control rule for setting the TAC of Downs herring, supported by increased research effort into the dynamics of this component in fisheries in the central and northern North Sea.

3.4 Principle Two: Ecosystem Background

3.4.1 The Ecosystem

3.4.1.1 Marine Environment Research

The principal Norwegian marine environment research institute with specific responsibilities for the monitoring, assessment and provision of advice on living marine resources is the Institute of Marine Research (IMR, Havforskningsinstituttet), Bergen (http://www.imr.no/en). Although IMR has primary responsibility with respect to fisheries and all associated marine environmental research, it works in close partnership with numerous other Norwegian research and advisory bodies; *e.g.* the Norwegian Institute for Nature Research (NINA; http://www.nina.no/ninaenglish/Start.aspx), the Norwegian Polar Institute (NPI; http://www.npolar.no/en/), the Fridtjof Nansen Institute (FNI; http://www.fni.no) as well as several of the Norwegian universities. IMR is also an active participant in or scientific advisor to the many international bodies that undertake or coordinate research and management in the marine environment and its resources; *e.g.* the Joint Norwegian–Russian Fisheries Commission (JNRFC; http://www.jointfish.com/eng), the Oslo and Paris Commission for the protection and conservation of the North-East Atlantic and its resources (OSPAR; www.ospar.com), the International Council for the Exploration of the Sea (ICES, www.ices.dk), the International Whaling Commission (IWC; www.iwc.org), the North East Atlantic Fisheries Commission (NEAFC), the North Atlantic Marine Mammal Commission (NAMMCO; www.nammco.no). Although Norway is not a member of the European Union (EU), IMR is an active participant in many of the marine environment and resource research and development projects facilitated and coordinated by the European Commission (EC; http://ec.europa.eu/fisheries/index_en.htm).

Much of the monitoring and research undertaken by IMR is aimed at meeting the short-term need for advice on the management of fish stocks year-on-year. In this context it is among the leading world research institutes and has established a substantial body of data relating to its principal living marine resources dating back more than seventy years. This substantial body of information provides a bedrock upon which to base its long-term objectives for the development of ecosystem models[3,4] that underpin more holistic, ecosystem-based management plans such as the Barents Sea–Lofoten Management Plan (MFCA, 2012;[5] Olsen *et al*., 2007)[6] and the Norwegian Sea management plan (MinEnv, 2009).[7] Following the implementation of the Norwegian North Sea–Skagerrak management plan (Klif, 2012)[8] in 2013, all Norwegian waters are now subject to integrated management plans. These plans seek to balance the needs of all the component parts of the ecosystem, *e.g.* predator–prey

[3] ATLANTIS; http://www.imr.no/temasider/modeller/atlantis/atlantis/en
[4] NORWECOM.E2E; http://www.imr.no/temasider/modeller/norwecom.e2e/norwecom.e2e/en
[5] MFCA, 2012. Integrated Management Plans available at: http://www.fisheries.no/resource_management/Area_management/Integrated_management_plans/
[6] Olsen, E., Gjøsæter, H., Røttingen, I., Dommasnes, A., Fossum, P. & Sandberg, P. 2007. The Norwegian ecosystem-based management plan for the Barents Sea. ICES Journal 0f Marine Science 64: 599–602.
[7] MinEnv, 2009. Report No. 37 to the Storting (2008-2009) Integrated Management of the Marine Environment of the Norwegian Sea Report No. 37 (2008 – 2009) to the Storting.
[8] Klif, 2012. Integrated management plan for the North Sea and Skagerrak. Norwegian Climate and Pollution Agency, Oslo. http://www.klif.no/english/english/Areas-of-activity/Integrated-management-plan-for-the-North-Sea-and-Skagerrak/

interactions, as well as ensuring the long-term sustainability of the commercial fisheries. The Norwegian ecosystem modelling programmes also contribute to the wider research efforts in this field (Bjørge, 2008;[9] Hjøllo).[10] Indeed, considerable research effort has been invested in modelling the interaction of fish species within marine ecosystems[11, 12, 13, 14, 15, 16]. In 1981 and 1991 ICES mounted a multinational fish sampling programme known as 'year of the stomach' to gather fish predator–prey data to underpin the multi-species virtual population assessment (MSVPA) model (Sparre, 1984);[17] such modelling work is ongoing in IMR[18] and ICES (WGSAM, 2011; WGECO, 2012).[19,20]

A core activity for IMR is the gathering, collation and analysis of the data that underpin the assessment of individual fish stocks and their fisheries. Every fishing vessel must retain, record and land all commercial species, irrespective of quota allocations[21]. These catch data are reported to and validated by the Directorate of Fisheries (DoF) before being passed to IMR as the basic building block of the stock assessments. The IMR also manages the Norwegian reference-fleet project in which observers are carried aboard commercial fishing vessels representing all sectors of the Norwegian fleet, inshore and offshore, pelagic and demersal, and gather more detailed catch information than has been the statutory requirement hitherto. The observers also undertake biological sampling of the catch (IMR, 2010)[22,23].

Not only has IMR built up a substantial body of scientific data over the decades, its staff have also been at the forefront of publishing its findings through the local news media, national and international trade press, scientific meetings and internationally peer-reviewed

[9] Bjørge, Q. 2008. New research programme focusing on coastal and fjord ecosystems. Marine News 3–2008. http://www.imr.no/epigraph/filarkiv/hi_news_3_eng_web.pdf/nb-no

[10] Hjøllo, S.S., 2007. EcoFish WP2 workandWind, NAO and ecosystem-selected articles. IMR, Bergen. http://ecofish.imr.no/__data/page/6432/work_and_Wind,_NAO_and_ecosystem-selected_articles080307.pdf

[11] Vinther, M. 2001. Ad hoc multispecies VPA tuning applied for the Baltic and North Sea fish stocks. ICES Journal of Marine Science, 58: 311–320.

[12] Lewy, P., & Vinther, M. 2004. A stochastic age–length-structured multispecies model applied to North Sea stocks. ICES CM 2004/FF: 20. 33 pp.

[13] Kempf, A., Floeter, J., & Temming, A. 2006. Decadal changes in the North Sea food web between 1981 and 1991—implications for fish stock assessment. Canadian Journal of Fisheries and Aquatic Sciences, 63: 2586–2602.

[14] Mackinson, S., & Daskalov, G. 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Science Series Technical Report, Cefas Lowestoft, 142.

[15] WGRED, 2008. Report of the Working Group for Regional Ecosystem Description ICES CM 2008/ACOM:47. 203 pp.

[16] Dickey-Collas, M., Nash, R.D.M., Brunel, T., van Damme, C.J.D., Marshall, C.T., Payne, M. R., Corten, A., Geffen, A.J., Peck, M.A., Hatfield, E.M.C., Hintzen, N.T., Katja Enberg6, Kell, L.T. & Simmonds, E. J. 2010. Lessons learned from stock collapse and recovery of North Sea herring: a review. ICES Journal of Marine Science, 67: 1875–1886

[17] Sparre, P. 1984. A computer program for estimation of food suitability coefficients from stomach content data and multipsecies VPA. ICES CM 1984/25.

[18] http://www.imr.no/forskning/programmer/okosystem_og_bestandsdynamikk/en

[19] WGSAM, 2011. Report of the Working Group on Multispecies Assessment Methods. ICES CM 2011/SSGSUE:10. 229 pp. .

[20] WGECO, 2012. Report of the Working Group on the Ecosystem Effects of Fishing Activities. ICES CM 2012/ACOM:26. 192 pp.

[21] http://www.fisheries.no/resource_management/Resource-management/

[22] IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1–2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en

[23] http://www.imr.no/temasider/referanseflaten/en

journals and, most recently, through its own comprehensive web site and that of the Directorate of fisheries (DoF; http://www.fiskeridir.no/english). The IMR website provides an introduction to their expertise, data[24] and the results from their research,[25] not the least of which includes modelling of the Norwegian Sea ecosystem.[26] Much of the information that follows on the Norwegian seas ecosystems and their resources is a précis of what IMR has published or has been collated under the auspices of ICES though the fully referenced introduction to the ICES advice for the North East Arctic in 2009.[27]

Since 2011, IMR has provided the secretariat and been a core member of a multi-agency, joint government–industry funded fishery–science partnership – the Centre for Research Innovation in Sustainable fish capture and Processing technology (CRISP).[28] The research is organised in six scientific work packages: development of instrumentation for fish identification prior to capture; monitoring fish and gear behaviour during fishing; development of methods to release unwanted catch unharmed; development of low-impact trawl gear; adaptation of capture and handling practices to optimize catch quality and value; analysis and documentation of the economic benefits to the fishing industry of converting to more sustainable capture techniques. Of these, it is the first three that are of greatest immediate relevance to this assessment as they are aimed at helping skippers to identify target species with even greater certainty than at present and thereby minimise the need to release (discard or slip) unwanted catch (Breen et al., 2012)[29]. As an interim measure to minimise slipping related mortality, DoF introduced the requirement for all purse-seine headlines to be fitted with a point-of-no-return marker buoy that is readily seen at distance from surveillance vessels or aircraft. Catches may be slipped any time up to the point where the maker buoy is alongside the purse seiner but once it is alongside the catch must be taken aboard, recorded and landed. Scientists at IMR were consulted on the appropriate position for the buoy but the effectiveness of the measure has yet to be evaluated.

3.4.1.2 The North Sea Topography and Oceanography

The topography of the North Sea can broadly be described as having a shallow (<50 m) south-eastern part, which is sharply separated by the Dogger Bank. To the north of the Dogger Bank the depths gradually increase towards the 200 m isobath just north of Shetland. A deep water trench (>200 m), the Norwegian Rinne, runs south along the Norwegian coast and into the Skaggerak where it ends abruptly. The Kattegat is shallow like the southern North Sea.

The substrates are dominated by sands in the southern and coastal regions and by fine muds in deeper and more central parts. Local concentrations of boulders are found in the shallow southern part, transported there by glaciers during the ice ages. The area around

[24] http://www.imr.no/forskning/forskningsdata/en
[25] http://www.imr.no/forskning/en
[26] http://www.imr.no/forskning/programmer/okosystem_norskehavet/en
[27] ACOM, 2009. The Barents Sea and Norwegian Sea: Ecosystem. ICES Advice Book 3.1. http://www.ices.dk/committe/acom/comwork/report/2009/2009/Barents%20Sea%20Ecosystem%20overviews.pdf
[28] CRISP, 2013. CRISP Annual Report 2012. Institute of Marine Research, Bergen. http://www.imr.no/filarkiv/2013/04/crisp_annual_report_2012_screen.pdf/en
[29] Breen, M., Isaksen, B., Ona, E., Pedersen, A.O., Pedersen, G., Saltskår, J., Svardal, B., Tenningen, M., Thomas, P.J., Totland, B., Øvredal, J.T., and Vold, A., 2012. A review of possible mitigation measures for reducing mortality in purse-seine fisheries. ICES Annual Science Meeting CM 2012/C:12. http://info.ices.dk/iceswork/asc/2012/themesessions/Abstracts%20Session%20c_ED.pdf (Abstract)

the Orkney–Shetland archipelago is dominated by coarse sand and gravel. These glacial deposits of gravel throughout the eastern North Sea provide spawning substrata for herring. Other important habitats include the extensive biogenic reefs of *Lophelia perusa* that are found along the Norwegian coastline and in the eastern Skagerrak, and *Sabellaria* spp. reefs that occur in more southern areas, although their distribution and extent is not known.

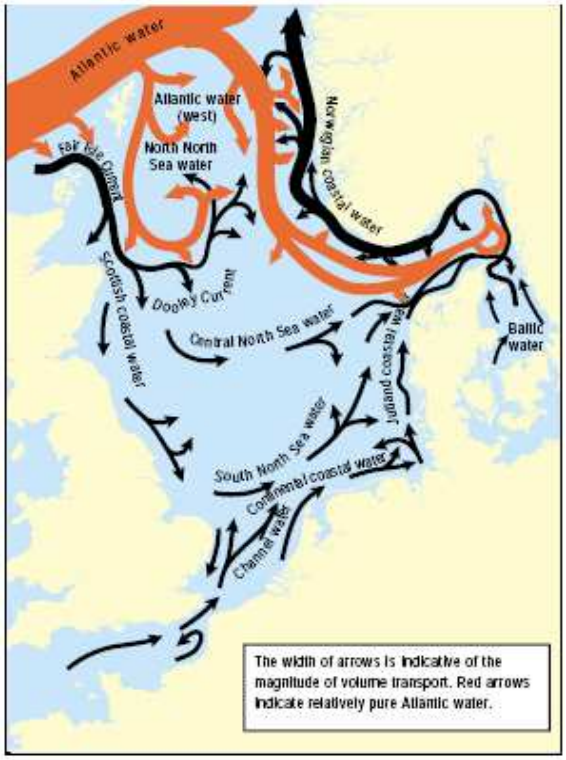


Figure 12 General circulation pattern in the North Sea. (after Turrell et al., 1992).[30]

The circulation is basically cyclonic (Figure 12). The main inflow is of relatively warm and more saline North Atlantic water along the shelf break into the deep-water trench along the SW coast of Norway and also around the Shetland and Orkney Islands. Changes in zooplankton and fish distributions have been linked to the strength of these inflows. Atlantic water also enters into the southern North Sea, via the English Channel. The Kattegat and eastern Skagerrak are strongly influenced by brackish surface water entering from the Baltic that follows the Swedish coast and turns west along southern Norway to form the north-flowing Norwegian Coastal Current. The bottom water layer, however, is of oceanic origin and runs below the brackish water layer in the opposite direction. Water south of the Dogger Bank is well mixed and shows distinct seasonal temperature variations; north of the Dogger Bank there is a summer thermocline and more stable bottom temperatures.

[30] Turrell, W. R., Henderson, E. W., Slesser, G., Payne, R. & Adams, R. D., 1992. Seasonal changes in the circulation of the northern North Sea. *Continental Shelf Research* **12**, 257–-286.

3.4.1.3 Primary Production

Primary productivity is dominated by diatoms and dinoflagellates. Up to the 1970s primary production followed a classic spring–autumn bloom pattern. Since the 1970s, however, this separation has become increasingly blurred and primary production has been continuous over much of the year, also over a longer period. This longer and less bipolar productivity has led to a much greater primary production in all recent years, associated with a reduction in diatom production and an increase in dinoflagellates. Theoretically this should provide more food at the base of the food web.

3.4.1.4 Secondary Production

The zooplankton is dominated by copepods and euphausids, both important food items for many key commercial stocks, not the least of which are the herring and sprat. Changes in the zooplankton community show that the abundance of copepods (particularly *Calanus finmarchicus*) has declined severely in the last 10–20 years. The relative proportions of *C. finmarchicus* to *C. helgolandicus* have also changed markedly, the former dominating up to the 1970s (representing around 70% of the zooplankton biomass) and the latter since 1995. *C. helgolandicus* prefers warmer waters and is generally a smaller and less profitable prey than *C. finmarchicus* for some fish species. These changes in plankton community structure have potentially significant implications for, *inter alia*, herring and sprat populations, both of which feed on copepods and, in turn, are important prey species for many other fish, birds and mammals.

3.4.1.5 Benthic communities

The 50 m, 100 m, and 200 m depth contours broadly define the boundaries between the main North Sea benthic communities. The diversity of infauna and epifauna is lower in the southern North Sea than in the central and northern North Sea. However, large-scale spatial gradients in biomass are less pronounced. Bottom temperature, sediment type, and trawling intensity have been identified as the main environmental variables affecting community structure. Epifaunal communities are dominated by free-living species in the south and sessile species in the north. Reliable information on trends in biomass of benthic species is largely lacking. Although it is recognized that towed bottom gears kill off large quantities of benthic animals and that direct effects are undoubtedly large even if the long-term effect is unknown. It should also be recognised that the benthic eggs of herring are also vulnerable to the adverse effects of any seabed interaction, whether associated with fishing or some other activity. Nevertheless, pelagic trawls and purse seines, such as are used in herring fisheries, have no direct interaction with benthic communities.

3.4.1.6 Fish community

ICES estimates of the total biomass of North Sea fish in the 1980s were in the order of 12 million tonnes, approximately 67% of which consisted of the major eleven exploited species. Throughout the year, the pelagic component is dominated by herring *Clupea harengus*. Mackerel *Scomber scombrus* and horse mackerel *Trachurus trachurus* are mainly present in the summer when they enter the area from the south and from the northwest. Dominant

gadoid species are cod *Gadus morhua*, haddock *Melanogrammus aeglefinus*, whiting *Merlangius merlangus*, and saithe *Pollachius virens*; the main flatfish species are common dab *Limanda limanda*, plaice *Pleuronectes platessa*, long rough dab *Hippoglossoides platessoides*, lemon sole *Microstomus kitt*, and Dover sole *Solea solea*. The major forage (prey) fish species are sandeels *Ammodytes marinus*, Norway pout *Trisopterus esmarki*, and sprat *Sprattus sprattus*, but juvenile herring and gadoids also represent an important part of the forage stock. Large annual variations in species composition can occur as a consequence of natural fluctuations in recruitment success of the individual species and, potentially, the effects of exploitation.

North Sea herring and mackerel were heavily overfished in the 1960s and 1970s and the stocks collapsed. The herring stock has recovered following a closure of the fishery in the late 1970s. The North Sea spawning component of the NE Atlantic mackerel stock has remained low but contributes to commercial catches when mackerel from the stock's western spawning component enter the northern North Sea in summer.

Absolute numbers of small fish belonging to all species and of demersal species with a low maximum length have steadily and significantly increased over large parts of the area during the last 30 years, while the abundance of large fish has decreased. The most plausible explanation for this is the reduction of the predation pressure on juvenile fish and on species that remain small. This is as an indirect effect of overexploitation of the large predatory (demersal) fish species[31].

Over the past 10–20 years a number of warmer-water species, e.g. pilchards *Sardina pilchardus*, sea bass *Dicentrarchus labrax* and red mullet *Mullus surmuletus*, have increased in abundance, presumably in response to rising sea temperatures. In contrast, some species that have been fairly common historically have virtually disappeared from the North Sea (e.g. blue fin tuna *Thunnus thynnus*) or have become very rare (e.g. halibut *Hippoglossus hippoglossus* and porbeagle shark *Lamna nasus*). The stocks of most elasmobranchs are at low levels. Only rarely are any of these species taken in pelagic trawls or purse seines such as are used in the herring fisheries.

3.4.1.7 Birds

North Sea seabird populations are monitored by numerous national statutory and voluntary[32] organisations, including the Norwegian Institute for Nature Research (NINA),[33] many of which contribute to the corresponding ICES working groups that monitor seabird–fishery interactions (WGSE, 2011;[34] AGSE, 2012).[35]

[31] Daan, N., Gislason, H., Pope, J.G. & Rice, J. 2005. Changes in the North Sea fish community: evidence of indirect effects of fishing? ICES Journal of Marine Science, 62: 177–188. http://icesjms.oxfordjournals.org/content/62/2/177.full.pdf

[32] http://www.birdlife.org/seabirds/index.html

[33] http://www.nina.no/ninaenglish/Publications.aspx

[34] WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf

[35] AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82

About 2.5 million pairs of seabirds breed around the coasts of the North Sea, encompassing some 28 species. While most species breed in dense colonies along the coast others may only feed there. Auks and cormorants dive from the surface, gannets and terns use plunge diving, and gulls feed mostly at the surface. Their food resources vary accordingly, ranging from plankton to small schooling fish and a few species profit directly from human consumption fisheries, either discards or offal, e.g. fulmars and gulls. Twelve out of 28 species have shown an increasing trend over the past 10–20 years and four a decreasing trend, while four appear to be stable and for another four the situation is unknown. Local breeding success of some species has been low in some recent years, possibly due to a local shortage of forage fish.

There is constant concern that fisheries affect seabird populations not only through competition for the resource but also directly through fishing-related bird mortality. In Norway, NINA has published results from on a fishery survey that focussed on the static gear fisheries for Greenland halibut (offshore longlines) and inshore set nets (for lumpsuckers)[36]. Although this report concluded that significant numbers of seabirds may be captured in these fisheries they have yet to publish any data or raise specific concerns with respect to the pelagic (herring) fisheries; nor has the ICES seabird ecology working group raised specific concerns (AGSE, 2012). It can be assumed that this is because there are no adverse data as Bowering et al. (2011) found that reference-fleet observers have recorded seabird mortalities among the Norwegian demersal fishing fleet but seabirds were not recorded in any of the pelagic fisheries. Nevertheless, ICES has recommended that there is an immediate and critical need for more systematic data collection of seabird bycatch data throughout EU waters and for a standard protocol and format for recording these data.[37]

3.4.1.8 Marine mammals

North Sea marine mammal populations are monitored by numerous coastal states' statutory organisations, including the Institute of Marine Research ($IMR_{mammals}$, 2011)[38] all of which contribute to the corresponding ICES working groups that monitor marine mammal–fishery interactions (WGMME, 2013).[39]

Many cetacean and pinniped species have been observed within the North Sea, but only a few constitute resident representatives of the North Sea ecosystem. Both harbour *Phoca vitulina* and grey *Halichoerus grypus* seals are typically coastal, because they need haul-out

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf

[36] Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt med focus på fiske med garn og line. NINA Rapport 719. http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf

[37] ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, **Book 1: 1.5.1.3**. http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf

[38] $IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en

[39] WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf

sites for pupping and weaning. However, they make extensive foraging trips into the open sea, particularly grey seals.

Seals interact with various fishing operations; they sometimes feed on fish caught in static gear, in which they can also become ensnared. Estimates of annual fish consumption by grey seals increased substantially between 1985 (49 000 t) and 2002 (161 000 t) in line with the almost threefold increase in the grey seal population size. In 2002 grey seals in the North Sea consumed mainly sandeel (69 000 t), cod (8300 t), haddock (6500 t), and plaice (5200 t), but whiting, saithe, ling and herring were also taken.

Very little data exists on the bycatch of seals in the North Sea but bycatch deaths are thought to be in the low hundreds per year. These are mainly grey seals-associated with the herring and mackerel fisheries. In a recent study, 2% of tagged seals were killed in fishing gear, mainly gill and tangle nets. The impact of this bycatch level on the seal population is not thought to be significant.[40]

Although several cetacean species visit the North Sea, the dominant species are harbour porpoise *Phocoena phocoena* (about 340 000), white-beaked dolphin *Lagenorhynchus albirostris* (7900) and minke whale *Balaenoptera acutorostrata* (7300), which are known to prey on herring[41, 42]. Harbour porpoises, are most abundant in the southern North Sea; minke whales and white-beaked dolphins have overlapping distributions and are mainly found in the northern North Sea. A small resident population (approximately 130 individuals) of bottlenose dolphins *Tursiops truncatus* is located off the east coast of Scotland.

A main concern about interactions with human activities is the by-catch in fishing operations and the perceived effects on population dynamics. Although there are some fisheries that give particular cause for concern, not the least of which is the French pelagic-trawl sea bass fishery in the western English Channel, pelagic fisheries are not generally thought to be a major cause for concern.[43] No specific concerns have been raised with respect to NS&SH fisheries.

3.4.2 Capture of non-target species in the Norway North Sea & Skagerrak herring fishery

3.4.2.1 Retained fish species

By law, all Norwegian-registered fishing vessels must retain, record and land all commercial species caught; the only exception being halibut less than 80 cm total length which must be returned to the sea alive. The level of monitoring, compliance and surveillance of Norwegian fisheries, including recording of bycatch (MSC 'retained catch') and levels of discards (MSC

[40] JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564
[41] Tjelmeland, S. & Lindstrøm, U. 2005. An ecosystem element added to the assessment of Norwegian spring spawning herring: implementing predation by minke whales. ICES Journal of Marine Science, 62, 285–294
[42] Lindstrøm, U., Smoutb, S., Howell, D. & Bogstad, B. 2009. Modelling multi-species interactions in the Barents Sea ecosystem with special emphasis on minke whales and their interactions with cod, herring and capelin. Proceedings of the ECONORTH Symposium on Ecosystem Dynamics in the Norwegian Sea and Barents Sea. Deep Sea Research 56, 2068–2079.
[43] Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, **41**. doi:10.1016/S0165-7836(99)00013-2

'bycatch'), was subject to independent review and given a positive assessment and high score (9/10; Skaret & Pitcher, 2006)[44]. (It should also be noted that this review covered all aspects of Norway's fishery resource management, including environmental protection measures, all of which achieved averages higher than 5/10.) On pelagic fishing vessels, however, it is not always practical to comply with the letter of the regulations, not least because of the quantities of fish that are caught in relatively short times and the practice of pumping fish direct from the net into the RSW tanks.

It is recognised that with the array of electronic aids available to skippers and their expertise in interpreting what these aids are telling them, plus the real-time exchange of information among skippers on the fishing grounds, pelagic catches tend to comprise a very high percentage of the target species; i.e, the catches are 'clean'. In the event that an appreciable quantity of non-target fish is caught, it may be separated on board if facilities permit or, more probably, at the processing plant when the fish is landed. Whichever it is, the quantity of all fish landed is recorded by species against the vessel quota. In the event that the quantity of non-target fish caught is trivial, it may be taken to the ship's galley, discarded, or landed but not recorded against the vessel quota.

In all, eleven species of fish other than herring are retained, landed and recorded by species: mackerel, Norway pout, horse mackerel, saithe, blue whiting, sprat, whiting, haddock, silvery pout, cod and hake. Even though all taken were in nugatory quantities (<<100 t) relative to the scale of the North Sea–Skagerrak and their respective target fisheries, mackerel, Norway pout, horse mackerel and saithe are deemed to be main retained species, while the remainder are classified as other retained species (Table 11). The miscellaneous category is the sum of a variety of species caught individually and is given no further consideration here.

In addition to the eleven separate species recorded as retained species, the NS&SH catch includes a small component of herring from another (less robust) stock – the Western Baltic spring-spawning herring stock (WBSSH; $ACOM_{WBSSH}$, 2013)[45]. These fish cannot be differentiated visually from North Sea autumn-spawning herring; they are identified by post-hoc biological sampling and analysis of meristic and otolith characteristics. The total North Sea herring catches are then allocated to the appropriate stock on the basis of the proportions of North Sea and Western Baltic fish identified in the samples (see Section 3.3.1 for further details). The allocation of herring between stocks and across fishing areas is summarised in "The Wonderful Table" of the ICES Herring Assessment Working Group (HAWG, 2013)[46]. The estimation of the quantity of WBSSH taken by the Norwegian fleet fishing NS&SH is summarised here (Table 12) based on data from HAWG (2013).

[44] Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2).
ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf

[45] $ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf

[46] HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06.
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf

Table 11 Non-target species retained, landed and recorded (tonnes) in the fishery for North Sea & Skagerrak herring (Client data).

	Pelagic trawl			Average 2010–12	Purse seine			Average 2010–12
	2010	2011	2012		2010	2011	2012	
Mackerel	—	19	28	16	26	32	62	40
Norway pout	—	5	—	2	89	12	12	38
Horse mackerel	—	22	2	8	18	20	27	22
Saithe	—	—	8	3	—	11	36	16
Blue whiting	—	1	—	+	1	10	5	5
Sprat	—	—	2	1	—	8	—	3
Whiting	—	2	2	1	6	—	—	2
Haddock	—	1	2	1	2	3	—	2
Silvery pout	—	—	—	—	—	—	4	1
Cod	—	—	1	+	—	+	—	+
Hake	—	—	1	+	—	—	—	—
Miscellaneous	—	—	—	—	6	—	—	2

Table 12 Estimation of the proportions of Western Baltic spring-spawning herring in the Norwegian herring catch in the North Sea and Skagerrak. Baseline data are from "The Wonderful Table" of the ICES Herring Assessment Working Group (HAWG, 2013). *, data from client.

	2010	2011	2012	**Three-year average 2010–12**
North Sea Fishery				
Total catch of herring caught in transfer area in Div Iva East	9586 t	14829 t	35351 t	
Estimated WBSS herring caught in transfer area in Div Iva East	800 t	300 t	2100 t	
WBSSH as percentage of total herring catch (WBSS%)	8%	2%	6%	
Total Norwegian catch of herring caught in transfer area in Div Iva East	7362 t	12922 t	32714 t	
Total Norwegian catch x WBSS% = Norwegian catch of WBSSH	614 t	261 t	1943 t	**939 t**
Skagerrak Fishery				
Total catch of all herring (NS + WBSS) caught in Div IIIa	37600 t	20000 t	27500 t	
Estimated WBSS herring caught in Div IIIa	23800 t	11600 t	15506 t	
WBSSH as percentage of total herring catch (WBSS%)	63%	58%	56%	
Total Norwegian catch of herring caught in Div IIIa	330 t	100 t	400 t	
Total Norwegian catch x WBSS% = Norwegian catch of WBSSH	208 t	58 t	225 t	**164 t**
North Sea + Skagerrak Fishery				
Total Norwegian catch of herring caught throughout ICES sub-Area IV (North Sea)	46816 t	60705 t	119253 t	75591 t
Total Norwegian catch of herring caught throughout ICES Div IIIa	330 t	100 t	400 t	
Total Norwegian catch of herring in North Sea and Skagerrak (NS&SH + WBSSH)	47416 t	60805 t	119653 t	
Total Norwegian catch of WBSSH in North Sea and Skagerrak	822 t	319 t	2168 t	**1103 t**
Proportion of Norwegian herring catch by purse seine in NS&SH fishery				0.80
Norwegian purse-seine catch of WBSSH				**882 t**
Proportion of Norwegian herring catch by pelagic trawl in NS&SH fishery				0.06
Norwegian pelagic trawl catch of WBSSH				**66 t**
Proportion of Norwegian herring catch by all other gears in NS&SH fishery				0.14

3.4.2.1.1 Western Baltic spring-spawning herring

WBSS herring are taken along with North Sea herring by both pelagic trawlers and purse seiners. It is estimated that over the three-year period 2010 – 12 the purse seiners caught 882 t (c. 1.2% the total Norwegian catch of NS&SH herring) of WBSSH and the pelagic trawlers 66 t (c. 0.1%; Table 12).

The WBSSH stock is resident in ICES Division IIIa and Subdivisions 22–24. In summer WBSSH migrate into the more saline parts of Division IIIa and the eastern parts of Division IVa (the Transfer Area; Figure 1). In both these areas they mix with North Sea autumn spawners and are caught together in the herring fisheries there. They cannot be separated in the catches and estimation of the proportions of each stock component in the catches is made by biological sampling.

There are currently no specific management objectives for the stock and there is no agreed management plan in place. A change in the stock assessment model in 2013 has resulted in a changed perception of both SSB and F. This has led to a revision of the reference points by ICES in 2013. Following that revision ICES notes that a formal management plan can now be developed and recommends that this should be done. In the meantime, ICES advice on the management of the WBSS herring stock is on the basis of a transition to MSY fishing mortality targets. This system has worked well with the agreed TAC in line with the advice. Estimates of the total catch of WBSSH in Division IIIa and Subdivisions 22–24, have not exceeded the agreed TAC since 2010. Firm control on the exploitation of the WBSSH component has been achieved in part by a management measure, introduced in 2011, to permit countries to transfer up to 50% of their TAC allocation in Division IIIa to a transfer area in Division IVa east in the North Sea (Figure 1). Monitoring shows that about 40% of the TAC in Division IIIa was taken in the North Sea transfer area in 2011 and 2012.

ICES has defined a range of biological reference points (Table 13). Following the ICES MSY transition approach for the fishery in 2013 results in a fishing mortality of F0.39 (F_{msy}=0.28) and a predicted SSB of 106Kt. The MSY transition approach for the fishery in 2014 results in a reduction in the fishing mortality to F 0.3 resulting in a predicted SSB in 2014 of 114Kt. This would take the SSB to above the MSY biomass trigger level of 110 kt.

Table 13 Biological reference levels defined for the management and sustainable harvesting of Western Baltic spring-spawning herring (ACOMWBSSH, 2013)[47]

	Parameter	Value
Management plan	MSY $B_{trigger}$	110 kt
	F_{MSY}	0.28
Precautionary approach	B_{lim}	90 kt
	B_{pa}	110 kt

3.4.2.1.2 Mackerel *Scomber scombrus*

Mackerel is a main retained species in both the pelagic-trawl and purse-seine fisheries.

The annual assessment and provision of management advice is made on the premise that mackerel in European waters comprise one Northeast Atlantic stock but with three spawning components: North Sea mackerel which spawn in the central part of the North Sea and Skagerrak (May–July); western mackerel which spawn west of Ireland and the British Isles (May–July); and southern mackerel which spawn in Spanish and Portuguese waters (February–May) ($ACOM_{mack}$, 2012)[48].

After spawning the western and southern mackerel migrate to the northern North Sea and Norwegian Sea, and after a while also migrate to the Skagerrak, where the mackerel mix

[47] $ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf

[48] $ACOM_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf

with the North Sea spawners. The southern and western components remain here through autumn and even into winter (December-March), until they migrate back to their respective spawning areas.

Spawning stock biomass is estimated from annual egg production measured during international scientific surveys from February to July. The surveys are ICES coordinated international programmes that are undertaken every third year (WGMEGS, 2012)[49]. Surveys of the North Sea spawning component is normally undertaken by Netherlands and Norway.

The stock is subject to an analytical age-based assessment validated every third year against the international spawning stock egg survey. There is a full suite of biologically based reference points (Table 14) and a defined management plan and harvest control rule that ICES has endorsed as being consistent with the precautionary approach and MSY framework. At present, the total international fishery is not in compliance with the terms of the management plan and harvest control rules. Although the spawning stock biomass is currently in excess of B_{MSY} and retains full reproductive capacity the fishing mortality rate is greater than F_{MSY} (F > 0.3; $ACOM_{mack}$, 2012).

Table 14 Biological reference levels defined for the management and sustainable harvesting of mackerel in the NE Atlantic (ACOMmack, 2012)

	Parameter	Value
Management plan	$SSB_{trigger}$	2.2 Mt
	F_{target}	0.20–0.22
MSY approach	MSY $B_{trigger}$	2.2 Mt
	F_{MSY}	0.22
Precautionary approach	B_{lim}	1.67 Mt
	B_{pa}	2.3 Mt
	F_{lim}	0.42
	F_{pa}	0.23

Stock 2013 2.67 Mt, F0.36.

3.4.2.1.3 Norway pout *Trisopterus esmarkii*

Norway pout is a main retained species in purse-seine fisheries and a retained species in the pelagic trawl fishery (Table 11).

Norway pout is a small, short-lived gadoid species that is distributed from the west of Ireland to Kattegat, and from the North Sea to the Barents Sea; it rarely gets older than 5 years. The distribution of the North Sea stock is in the northern North Sea (>57° N) and in Skagerrak at depths between 50 and 250 m. Spawning in the North Sea takes place mainly in the northern part in the area between Shetland and Norway; it is probably a one-time (semelparous) spawner (WGDSNSSK, 2012)[50].

[49] WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf

[50] WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13.

The fishery is performed almost exclusively by Danish and Norwegian vessels targeting the species with small-mesh trawls in the northern North Sea.

The population dynamics are very dependent on changes caused by variations in recruitment and in predation (or other natural) mortality, and less by the fishery. Recruitment is highly variable and influences spawning stock and total biomass rapidly, due to the short life span of the species. Furthermore, around 20% of age 1 is considered mature and is included in the SSB. Therefore, recruitment in the year after the assessment year does influence the SSB in the following year. Due to the short-lived nature of this species a preliminary TAC is set every year, which is updated on the basis of advice in the first half of the year ($ACOM_{NP}$[51], 2012).

The North Sea Norway pout stock is subject to an age-based (seasonal) analytical assessment, validated with data from four research-survey abundance indices. Fishing mortality levels have not been defined but spawning stock biomass levels are defined in terms of the precautionary approach (B_{pa} = 150 kt; B_{lim} = 90 kt; Table 15) and the MSY framework (B_{MSY} = 150 kt). The annual fishing mortality rate has shown a progressive, albeit fluctuating, decline from the 1980s through to *c.* 2005, since when it has varied between zero and 0.4 depending on stock and fishery. The stock fell slightly below Blim in 2005 but apart from that it has fluctuated broadly at or above MSY $B_{trigger}$ since *c.* 1990. The stock maintains full reproductive potential ($ACOM_{NP}$, 2012).

No management plan is agreed at present. ICES evaluated and commented on three management strategies in 2007, none of which has been agreed for management. Based on a new joint EU–Norway request in 2012, new long term management strategies were evaluated in September 2012. The evaluation showed that a minimum fixed TAC of around 25–50 kt is possible only if future fishing mortality does not exceed a value of 0.6. Fishing mortality in the past decade is estimated to have been lower than 0.6. ($ACOM_{NPMP}$ 2012b)[52].

Table 15 Biological reference levels defined for the management and sustainable harvesting of Norway pout in the North Sea ($ACOM_{NP}$, 2012)

	Parameter	Value
MSY approach	B_{MSY}	150 kt
	F_{MSY}	Undefined; not advised
Precautionary approach	B_{lim}	90.0 kt
	B_{pa}	150 kt
	F_{lim}	Undefined; not advised
	F_{pa}	Undefined; not advised

SSB 2013 205 kt, F = 0.7 ($ACOM_{NP}$, 2012).

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf

[51] $ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf

[52] $ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf

3.4.2.1.4 Horse mackerel *Trachurus trachurus*

Horse mackerel is a main retained species in the purse-seine fisheries and a retained species in the pelagic-trawl fisheries.

Three spawning stocks of horse mackerel are recognised in the NE Atlantic: a southern stock that spawns off Spain and Portugal; a western stock spawns in the Bay of Biscay, west of Ireland and Great Britain; a North Sea stock spawns in the southern North Sea. After spawning, the western horse mackerel undertake a feeding migration into the northern North Sea and the southern part of the Norwegian Sea, where it may be taken by Norwegian vessels fishing for herring. For assessment purposes, the catches are distributed to each stock according to when and where the catches are taken and separate management advice is given for each of the spawning stocks. Estimates of spawning stock biomass of the southern and western stocks have been made from triennial, ICES coordinated, international egg surveys (WGMEGS, 2012). These are dependent on accurate estimates of individual fish fecundity (number of eggs produced per year) but it appears that horse mackerel can adjust its egg production during the course of the spawning season, which renders stock assessment by egg production methods unreliable. Although precise stock status is uncertain it is assumed to retain full reproductive potential ($WGWIDE_{HM}$, 2012)[53].

From a peak of *c.* 400 kt in the mid 1990s, the total catch from this stock fell to *c.* 100 kt in 2007 and has been more or less at this level since then. The ICES working group carries out an age-based analytical assessment of the Western horse mackerel catch and sampling data but, at present, only one reference level has been defined: F_{MSY} = 0.13 ($ACOM_{HM}$, 2012)[54]. Over the period 2000 – 2008 the annual fishing mortality rate was below this level but it has been rising steadily from a low of < 0.05 in 2005 to the current level of *c.* 0.18. On the basis of the MSY approach, ICES has advised that catches in 2013 should be no more than 126 000 t.

SSB 2012 = 1.66 Mt, F 0.17.

3.4.2.1.5 Saithe *Pollachius virens*

Saithe are a retained species in both the purse-seine fishery and the pelagic-trawl fishery (Table 11).

Saithe is a widely distributed species and although ICES (age-based analytical) assessments are made on the basis of there being a specific NE Arctic stock (i.e. Norwegian Sea and Barents Sea) it is recognised that there is almost certainly migration and stock mixing with the North Sea, west of Scotland and the Faroe Islands, if not Iceland ($ACOM_{saithe}$, 2012).[55] Saithe are long-lived (20+ years) and tend to form large aggregations

[53] $WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf

[54] $ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES Advice Book 9.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf

[55] ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf

to a higher extent than other large gadoids. The juveniles (ages 0–2 years) generally occur in shallow coastal areas, where they are protected from directed fisheries, and start to mature at age 4 (15% mature) and at age 7 all fish can be regarded as being mature.

Catches have been relatively stable at *c.* 100 kt since the mid 1980s and fishing mortality rate has fluctuated around FMSY since the mid 1990s. Spawning stock biomass reached a low of *c.* 100 kt (≈ Bl_{im}; Table 16) around 1990 but then increased to *c.* 300 kt in 2005 but has fallen back to *c.* 200 kt (MSY $B_{trigger}$) since then. ICES is satisfied that the stock is being fished sustainably and that it has full reproductive potential. The fishery is managed in line with an EU–Norway management plan and harvest control rules that ICES considers to be consistent with the precautionary approach.

Table 16 Biological reference levels defined for the management and sustainable harvesting of saithe in the North Sea (ACOMNP, 2012)

	Parameter	Value
Management plan	SSB_{MP}	200 kt
	F_{MP}	0.30
MSY approach	MSY $B_{trigger}$	200 kt
	F_{MSY}	0.30
Precautionary approach	B_{lim}	106 kt
	B_{pa}	200 kt
	F_{lim}	0.60
	F_{pa}	0.40

Stock 2013 235 kt; F 0.24 ($ACOM_{saithe}$, 2012).

3.4.2.1.6 Blue whiting *Micromesistius poutassou*

Blue whiting is a retained species in both the purse-seine fishery and in the pelagic-trawl fishery (Table 11).

Blue whiting is one of the most abundant semi-pelagic fish stocks in the NE Atlantic where it is regarded as comprising one management unit but two main components, one northerly and one southerly, separated by the Porcupine Bank west of Ireland. Each winter, adult blue whiting migrate to spawning areas west of the British Isles. After spawning, the fish migrate northwards to feeding grounds in the northernmost North Sea and throughout the Norwegian Sea. The main fisheries on blue whiting in 2011 were conducted south of the Faroe Islands, west of Scotland, and around the Porcupine Bank, mostly in the first half of the year.

Throughout the 1980s and most of the 1990s, the total annual landings were *c.* 500 kt but they then rose steeply to a peak of almost 2500 kt in 2002–3 since when there has been an equally steep decline to a low of *c.* 100 kt in 2011 ($ACOM_{BW}$, 2012)[56]. There is an annual age-based analytical assessment of the stock and there is a suite of biological reference levels (Table 17). There is also an internationally agreed management plan and harvest control rules, to which Norway is a signatory.

[56] $ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf

Table 17 Biological reference levels defined for the management and sustainable harvesting of blue whiting in the NE Atlantic (ACOMBW, 2012)

	Parameter	Value
Management plan	$SSB_{trigger}$	2.25 Mt
	F_{target}	0.18
MSY approach	MSY $B_{trigger}$	2.25 Mt
	F_{MSY}	0.18
Precautionary approach	B_{lim}	1.50 Mt
	B_{pa}	2.25 Mt
	F_{lim}	Undefined
	F_{pa}	Undefined

Spawning stock biomass fluctuated around B_{MSY} throughout the 1980s and increased steeply from the late 1990s to 2002 – 3 after which it fell back to the earlier levels *c.* B_{MSY} but has shown signs of increase over the past two years. ICES considers that both the spawning stock biomass and the fishing mortality rate are currently at levels consistent with MSY and that the stock retains full reproductive potential. On the basis of the agreed management plan it has advised that the TAC for 2013 should be no more than 643 kt ($ACOM_{BW}$, 2012).

SSB 2013 = 5.13 Mt, F = 0.13 ($ACOM_{BW}$, 2012).

3.4.2.1.7 Sprat *Sprattus sprattus*

Sprats are retained species in both the pelagic-trawl and purse-seine catches (Table 11). Sprats are found throughout the coastal reaches of the North Sea and in the Skagerrak. It is a short-lived species (5 – 6 years) and the stock is dominated by young fish. The stock size is mostly driven by the recruiting year class; consequently, the fishery in a given year will be dependent on that year's incoming year class and only in-year catch forecasts are available. Precautionary reference points have not been defined for the North Sea stock and information is inadequate to estimate the absolute stock size. However, relative trends in biomass from an exploratory assessment indicate that the stock has fluctuated without trend for the past 10 years. There are no explicit management objectives for this stock but generally, the sprat fishery is not limited by the TAC ($ACOM_{sprat}$; 2012)[57].

Sprat in Division IIIa is mainly fished together with juvenile herring and the exploitation of sprat is limited by the restrictions imposed on fisheries for juvenile herring ($ACOM_{spratdiv3,}$ 2012)[58].

3.4.2.1.8 Whiting *Merlangus merlangius*

Whiting are recorded in small quantities as retained species in both the pelagic-trawl and purse-seine fishery for North Sea–Skagerrak herring (Table 11).

[57] $ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf
[58] $ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf

Whiting are found in the southern Norwegian Sea where they are part of the North Sea stock. They are mostly found near the bottom at 10–200 m depth, but they may also rise from the bottom up into mid-water layers. Although whiting are frequently taken in association with other gadoid species, and nephrops (*Nephrops norvegicus)*, only trivial quantities (< 50 t) are taken in the Norwegian spring-spawning herring fishery.

The stock is subject to an ICES analytical age-based assessment supported by two fishery-independent abundance indices but the only reference point is F_{MP} (0.30) as defined in the EU–Norway management plan for this stock. ICES has reviewed this plan but has not yet endorsed it as being consistent with either the precautionary or MSY approach. In 2011 ICES considered an F_{MP} of 0.3 (with a 15% TAC constraint) to be consistent with long-term stability even when recruitment is poor for several consecutive years. Based on a considerable revision in the level of fishing mortality in 2012, the target F is no longer considered applicable and the management target needs re-evaluation $ACOM_{whit}$, 2012).[59]

Although there has been a sustained downward trend in fishing mortality over the past 20 years, SSB has also followed a negative trend, albeit with occasional peaks or increases. There has been a modest increase in SSB over the past 5 years.

SSB 2013 = 313 kt, F 0.17 ($ACOM_{whit}$, 2012).

3.4.2.1.9 Haddock *Melanogrammus aeglefinus*

Haddock are recorded in small quantities as retained species in both the pelagic-trawl and purse-seine fishery for North Sea–Skagerrak herring Table 11).

In common with haddock stocks elsewhere, North Sea haddock stock exhibits sporadic high recruitment, leading to dominant year classes in the fishery. These large year classes often grow more slowly than less abundant year classes, possibly due to density-dependent effects. Recruitment appears poorly determined by either spawning-stock biomass or egg production. Haddock primarily prey on benthic and epibenthic invertebrates, sandeels, and herring eggs. It might be postulated that the recent poor herring recruitment is a consequence of haddock predation on herring eggs but if this is the case, it is a one-off phenomenon that has not been examined in detail, not least because there is no comparable correlation between haddock abundance and herring recruitment over the past 30 + years ($AOM_{herring}$, 2012: $ACOM_{hadd}$, 2012)[60] suggests that this is not a significant problem. Haddock are an important prey species, mainly for saithe and other large gadoids.

The stock is subject to an annual ICES age-based analytical assessment and advice is formulated with respect to an EU–Norway management plan and harvest controls rules ($ACOM_{hadd}$, 2012)[61] based on a suite of defined biological reference points (Table 18). From the late 1970s through to the late 1990s the SSB fluctuated around the MSY $B_{trigger}$ level and

[59] $ACOM_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5. http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf

[60] ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf

[61] ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf

then rose sharply 2001 – 3 in response to recruitment of a strong year class. The stock has now fallen back to a little more than MSY $B_{trigger}$ as this year class fades from the picture. In response to the management plan, and the strong year class, fishing mortality rate has fallen progressively from a high of F = 1.0 in the late 1990s to a level fluctuating around FMSY since 2000. The stock retains full reproductive potential ($ACOM_{hadd}$, 2012).

Table 18 Biological reference levels defined for the management and sustainable harvesting of North Sea haddock (ACOMhadd, 2012)

	Parameter	Value
Management plan	$SSB_{trigger}$	100 kt
	F_{target}	0.30
MSY approach	MSY $B_{trigger}$	140 kt
	F_{MSY}	0.30
Precautionary approach	B_{lim}	100 kt
	B_{pa}	140 kt
	F_{lim}	1.0
	F_{pa}	0.7

SSB 2013 = 255 kt, F = 0.20 ($ACOM_{hadd}$, 2012).

3.4.2.1.10 Silvery pout *Gadiculus argenteus*

A very small quantity (4 t; Table 11) of this species was recorded in one year only (2012) in the purse-seine fishery.

Silvery pout is a small (15 cm) member of the cod family that is prey to many other larger (gadoid) species. There is not – or rarely – a directed fishery; it is used for fish meal. The species is ubiquitous in the shelf waters of the temperate NE Atlantic; it is not subject to any stock assessment. The average quantity caught in the herring fishery is so small (and rare) that the species does not merit further consideration here.

3.4.2.1.11 Cod *Gadus morhua*

The presence of cod is occasionally recorded in the catches of both pelagic trawls and purse seines. The fishery is managed on the basis of an EU–Norway management plan and harvest control rules but in this fishery it is caught in such miniscule quantites (< 1 t/year; Table 11) that it does not merit further consideration here.

3.4.2.1.12 Hake *Merlucius merlucius*

Hake was recorded in one year only (2012) in the pelagic-trawl fishery in such miniscule quantities (1 t; Table 11) that it does not merit further consideration here.

3.4.2.2 Bycatch fish species

Detailed information on non-commercial species is not yet collected and collated as a routine by Norwegian registered fishing vessels. Such data as there are, are collected by observers aboard Norwegian reference-fleet vessels, which include both pelagic trawlers and purse seiners (IMR, 2010)[62]. The observers collect information on the quantities of all fish species caught plus records of the numbers of birds and marine mammals caught. The reference fleet methodology and data have been subject to review by an international panel (Bowering *et al* 2011)[63] and the summaries of pelagic trawl catch composition and purse seine composition are shown in Table 11 and Table 12 respectively. The Bowering review does not separate the data into separate specific fisheries, the separation is limited to different gears. Consequently, the data summarised in Table 19 and Table 20 are an amalgamation of observations from targeted fisheries not only for herring but also the mackerel, capelin, blue whiting, Norwegian Sea, North Sea and Skagerrak fisheries. Within this gross amalgamation, species that are recorded on sales slips are those that meet MSC criteria for retained species (Table 11)), the remainder are bycatch species. The most abundant of the bycatch species that do not qualify as retained species in the North Sea–Skagerrak herring fishery (Section 3.4.2.1), i.e.sandeels and argentine (Table 19) are all subject to targeted fisheries and are, therefore, unlikely to be taken in significant quantities in the herring fishery. Relative to the total quantity of fish taken, all other bycatch species are taken in very small numbers, numbers that indicate minimal interaction between the targeted herring fishery and bycatch species or their stocks. All of the non-target species listed in Tables 13 & 14 that are taken in appreciable quantities are recognised as retained species (Table 7) for the purposes of this assessment. Quantities of other species are too trivial to be of immediate relevance or concern.

[62] IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en

[63] Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en

Table 19 Species (including non-fish species) recorded from all Norwegian pelagic fisheries combined, reference-fleet pelagic trawlers (Bowering et al. 2011). Numbers of target species such as spring spawning herring are those taken in other fisheries, e,g. spring spawning herring taken in mackerel or blue whiting fisheries.

Common name	Scientific name	Positive samples (n)	No. of fish (n)	Recorded on sales slips
North Sea herring	*Clupea harengus*	28	1776	Y
Retained species				
Norway pout	*Trisopterus esmarkii*	91	4146	Y
Blue whiting	*Micromesistius poutassou*	89	3285	Y
Greater argentine	*Argentina silus*	47	1369	Y
Sprat	*Sprattus sprattus*	17	1059	Y
Capelin	*Mallotus villosus*	11	739	Y
Mackerel	*Scomber scombrus*	31	196	Y
Horse mackerel	*Trachurus trachurus*	6	58	Y
Bycatch				
Sand eel	*Ammodytes marinus*	13	649	
Silvery pout	*Gadiculus argenteus*	42	610	
Argentine	*Argentina sphyraena*	44	584	
Whiting	*Merlangius merlangus*	24	67	
E. Atlantic gurnards	*Triglidae*	13	54	
Velvet belly	*Etmopterus spinax*	15	59	
Witch	*Glyptocephalus cynoglossus*	9	36	
Haddock	*Melanogrammus aeglefinus*	20	29	
European hake	*Merluccius merluccius*	14	17	
Saithe	*Pollachius virens*	7	20	
Grey gurnard	*Eutrigla gurnardus*	1	1	
Squids and octopus	*Cephalopoda*	2	2	
Unidentified	*Indeterminatus*	15	25	
		Total	14042	

Table 20 Species (including non-fish species) recorded from all Norwegian pelagic fisheries combined, reference-fleet purse seiners (Bowering et al., 2011). Numbers of target species such as spring spawning herring are those taken in other fisheries, e,g. spring spawning herring taken in mackerel or blue whiting fisheries.

Common name	Scientific name	Positive samples (n)	No. of fish (n)	Recorded on sales slips
North sea herring	*Clupea harengus*	24	848	Y
Retained species				
Mackerel	*Scomber scombrus*	122	5821	Y
Capelin	*Mallotus villosus*	89	5054	Y
Blue whiting	*Micromesistius poutassou*	36	1583	Y
Horse mackerel	*Trachurus trachurus*	39	1573	Y
Golden redfish	*Sebastes norvegicus*	5	6	Y
Bycatch				
Saithe	*Pollachius virens*	34	721	
Haddock	*Melanogrammus aeglefinus*	23	282	
Atlantic cod	*Gadus morhua*	26	204	
Norway pout	*Trisopterus esmarkii*	4	111	
Whiting	*Merlangius merlangus*	4	106	
Grey gurnard	*Eutrigla gurnardus*	9	66	
European plaice	*Pleuronectes platessa*	6	54	
European hake	*Merluccius merluccius*	6	14	
Garfish	*Belone belone*	13	23	
Lumpsucker	*Cyclopterus lumpus*	17	25	
Spurdog	*Squalus acanthias*	4	19	
Anglerfish (monk)	*Lophius piscatorius*	1	1	
Blackmouthed dogfish	*Galeus melastomus*	2	6	
Deepwater redfish	*Sebastes mentella*	3	3	
European flying squid	*Todarodes sagittatus*	2	4	
Flounder	*Platichthys flesus*	1	2	
Golden redfish	*Sebastes marinus*	5	6	
Greenland halibut	*Reinhardtius hippoglossoides*	1	2	
Lemon sole	*Microstomus kitt*	1	1	
Long rough dab	*Hippoglossoides platessoides*	1	3	
Norway redfish	*Sebastes vivparus*	1	2	
Pollack	*Pollachius pollachius*	2	2	
Ray's bream	*Brama brama*	3	8	
Saury pike	*Scomberesox*	1	4	
Stone crab	*Lithodes maja*	1	1	
		Total	11 501	

3.4.2.3 Endangered, threatened and protected species

Detailed information on ETP species is not yet collected and collated as a routine by Norwegian registered fishing vessels. Such data as there are, are collected by observers aboard Norwegian reference-fleet vessels, which include both pelagic trawlers and purse seiners (IMR, 2010). The observers collect information on the quantities of all species caught, including, elasmobranchs birds and marine mammals. The reference fleet methodology and data have been subject to review by an international panel (Bowering *et al* 2011). Although the data they reviewed included positive observation of the capture of both

bird and mammal species, such captures were limited to demersal fisheries; there was no evidence of captures made by pelagic fishing vessels (Table 19, Table 20). Insofar as there is evidence of pelagic fisheries capturing ETP species it is with the small number of elasmobranchs (velvet belly dogfish *Etmopterus spinax* in the trawl fishery, spur dogfish *Squalus acanthias* and blackmouth dogfish *Galeus melastomus*, in the purse-seine fishery (Table 19, Table 20). There are also very small numbers of golden redfish *Sebastes marinus*, a Norwegian red-list species) recorded in the purse seine catches (Table 20) but these are most likely to be caught in more northerly pelagic fisheries than in the North Sea–Skagerrak. Even if all these ETP fish species were taken only in the North Sea–Skagerrak fishery, the numbers caught indicate that the fishery is highly unlikely to be having a discernible effect on the species or their stocks.

3.5 Principle Three: Management System Background

The Norwegian fishery for North Sea and Skagerrak herring takes place in the Norwegian Economic Zone (NEZ). The stock is managed by Norway and the EU, based on a cooperation agreement from 1998, revised in 2004 and 2008.

The most important organizations involved in Norwegian fisheries management are government bodies such as the Ministry of Fisheries and Coastal Affairs, the Directorate of Fisheries and the Coast Guard, sales organizations such as Norwegian Fishermen's Sales Organization for Pelagic Fish (Norges Sildesalgslag), fishermen's organizations such as the Norwegian Fishermen's Association (Norges Fiskarlag) and environmental NGOs such as Greenpeace, WWF and the Norwegian Society for the Conservation of Nature (Norges Naturvernforbund). The roles, functions and responsibilities of the various actors are clearly defined in long-standing practice and are now codified in the Marine Resources Act.

The Ministry of Fisheries and Coastal Affairs decides on policy and regulatory schemes, while the Directorate of Fisheries acts as a technical body with a main responsibility for secondary legislation. The Directorate and the Coast Guard perform compliance control, on shore and at sea respectively. The decision-making processes include the allocation of national quotas to fleet groups according to an elaborate distributional scheme based on vessel groups defined by gear and length of the vessels. Further, technical regulations are defined by the Directorate of Fisheries, after consultations with user-groups and other stakeholders, as well as with other nations for shared stocks.

Norway has a long tradition of corporate policy-and decision-making in the fisheries sector, with continuous consultation and close cooperation between government agencies and user-group organizations, in particular the Norwegian Fishermen's Association but also the more specialized organizations such as the Fishermen's Sales Organization for Pelagic Fish. As these organizations have regional branches, whose representatives are actively involved in policy-making, local knowledge is also taken into consideration in the management process. The Regulatory Meetings organized twice a year are open to all; user-group organizations attend on a regular basis, various NGOs participate regularly. In addition there is regular day-to-day contact by telephone and email between authorities, user-groups and other interested parties.

The 2008 Marine Resources Act, which covers all living marine resources, requires that Norwegian fisheries management be guided by the precautionary approach and by an ecosystem approach that takes into account habitats and biodiversity. The same objectives

are found in the most relevant policy documents, such as the integrated management plans for the Barents and Norwegian Seas, and for the North Sea and Skagerrak. At the regional level, ICES has evaluated the EU–Norway management plan for the North Sea and Skagerrak herring and concluded that it is consistent with the precautionary approach[64], intended to constrain harvesting within safe biological limits and designed to provide for sustainable fisheries. Specifically the Marine Resources Act lists the following objectives for Norwegian fisheries management:

a) a precautionary approach, in accordance with international agreements and guidelines,
b) an ecosystem approach that takes into account habitats and biodiversity,
c) effective control of harvesting and other forms of utilization of resources,
d) appropriate allocation of resources, which among other things can help to ensure employment and maintain settlement in coastal communities,
e) optimal utilization of resources, adapted to marine value creation, markets and industries,
f) ensuring that harvesting methods and the way gear is used take into account the need to reduce possible negative impacts on living marine resources,
g) ensuring that management measures help to maintain the material basis for Sami culture.

Monitoring, control and surveillance is taken care of through shared responsibility and close collaboration between the Directorate of Fisheries, the Coast Guard and the regional sales organizations. The Directorate of Fisheries keeps track of how much fish is taken of the quotas of different vessels, vessel groups or other states at any given time, based on reports from the fishing fleet. Norwegian vessels are required to have electronic logbooks, where real-time catch data are forwarded to the Directorate of Fisheries.

The self-reported catch data can be checked at sales operations through the sales organizations, which have a monopoly on first-hand sale of fish in Norway, and through physical checks performed by the sales organizations, the Directorate of Fisheries and the Coast Guard. The sales organizations are required to record all landings of fish in Norway and keep track of how much remains of a vessel's quota at any given time, on the basis of the landings data. This information is compared to the figures provided by the vessels to the Directorate of Fisheries through the electronic logbook. The value of any catch delivered above a vessel's quota is retained by the sales organization and used for control purposes. The sales organizations have their own inspectors who carry out physical controls of landings. For instance, the Fishermen's Sales Organization for Pelagic Fish has five inspectors scattered along the Norwegian coastline. The Directorate has seven regional offices along the coast, staffed with inspectors that carry out independent physical control of the fish at the point of landing, including total volume, species and fish size. The landed volumes are then compared to the volumes reported to the Directorate through the logbooks. The Coast Guard is administratively part of the Norwegian Navy but performs tasks on behalf of several ministries, including the Ministry of Fisheries and Coastal Affairs. Its most important field of work, in practice, is fishery inspections. Coast Guard inspectors board fishing vessels and control the catch (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds. Using the established conversion factors for the relevant fish product, the inspectors calculated the volume of the

[64] ICES Advice September 2012, Book 9, Section 9.4.5

fish in round weight and compare this with the catches reported to the Directorate through the logbooks. Hence there are a number of possibilities for enforcement authorities to physically check whether the data provided by fishers through self-reporting are indeed correct. In addition, VMS data enables control of whether area restrictions are observed, among other things.

Norway has a research plan embodied in the objectives of the Marine Resource Act, the integrated management plans for the Barents Sea, the Norwegian Sea, the North Sea and Skagerrak, as well as in the statutory documents of the Institute of Marine Research. CRISP and MAREANO are more dedicated research plans. These various national plans feed into plans affecting the North East Atlantic at the international level, primarily in the ICES and OSPAR research and management systems. Further at the international level research plans exist in the Coastal State management plans. The primary objective of the research plans is to ensure the collection of scientific data necessary to conduct fisheries management according to the precautionary and ecosystem approaches. The various research plans are peer reviewed and the integrated management plans regularly revised and updated.

4 Evaluation Procedure

4.1 Harmonised Fishery Assessment

In order to ensure an acceptable degree of harmonization, the assessment of Norway North Sea and Skagerrak herring was harmonized with results of already certified / in assessment relevant overlapping fisheries as listed in Table 21.

Table 21 Overlapping MSC Fisheries assessments of the North Sea and Skagerrak autumn spawning herring stock.

Fishery	Assessment status	FAO	ICES	Gear
SPFPO Swedish North Sea herring*	Recertified 2013	Area 27	ICES divisions IVa, IVb, IVc, VIId	Pelagic purse seine
Danish Pelagic Producers Organisation North Sea herring	Certified 2009	Area 27	ICES divisions IV a, b, c, and VII d	Purse seine and pelagic trawl
Pelagic Freezer Trawler Association North Sea herring	Certified 2011	Area 27	ICES Divisions IV and VIId	Pelagic Otter Trawl
Scottish Pelagic Sustainability Group Ltd North Sea herring	Recertified 2013	Area 27	ICES Divisions IV and VIId	Trawl
Hastings Fleet Herring Drift Net Fishery	Recertified July 2012	Area 27	ICES Division VIId	Drift-net

*SPPO North Sea herring has joined with the Astrid Fisk North Sea herring fishery and formed the SPFPO Swedish North Sea herring fishery.

The assessment team for the Norway North Sea and Skagerrak herring took into account the evaluation, scoring and conditions for the above fisheries. Details of scoring for the compared assessments are outlined in APPENDIX 13.

Table 22 Harmonized PIs

Fishery	PI			
SPFPO Swedish North Sea herring*	1.2.2	2.5.2	3.1.4	3.2.5
Danish Pelagic Producers Organisation North Sea herring	-	2.5.2	-	-
Pelagic Freezer Trawler Association North Sea herring	1.2.2	-	-	3.2.5
Scottish Pelagic Sustainability Group Ltd North Sea herring	1.2.2	2.5.2	3.1.4	3.2.5
Hastings Fleet Herring Drift Net Fishery	1.2.2	2.5.2	3.1.4	3.2.5

PI 1.2.2 There are well defined and effective harvest control rules in place

Fishery	Score	Rationale	Justification of difference
Norway North Sea & Skagerrak herring	80	Scored at 80 because of lack of evidence at scoring issue b that the harvest rules and tools take into account a sufficiently wide range of uncertainty to justify the 100 criteria. Scoring issue c does not achieve 100 because of the lack of evidence that the harvest control rules and tools are fully effective in controlling the exploitation rate on the vulnerable Western Baltic Spring spawning herring. It does however now achieve the 80 scoring guidepost because of the recent changes in the rules which permit a significant portion of the Division IIIa TAC to be taken in the North Sea. Consideration was given to the current conflict, within the Management plan, between the +/-15% TAC change rule and exploitation within Management plan and MSY targets. The assessment team considered that because the harvest control rules were still achieving exploitation rates below both Management plan and FMSY levels, for adults and juveniles, then the rules were currently sufficiently effective at controlling exploitation to justify a score of 80 for this PI without a Condition.	The assessment team considered that because the harvest control rules were still achieving exploitation rates below both Management plan and FMSY levels, for adults and juveniles, then the rules were currently sufficiently effective at controlling exploitation to justify a score of 80 for this PI without a Condition. The assessment was done on the basis of additional years of data compared with the other assessments.
SPFPO Swedish North Sea herring	75	A well-defined harvest control rule is in place. However, it has proved to be not entirely consistent with the harvest strategy and can be considered to be still under development. There is recent evidence of the TAC being set above the level of the inter-annual variation constraint within the harvest control rule. Consequently the final decision of TAC has not been a strict interpretation of the HCR. Although the HCR is broadly working to maintain the stock size consistent with the harvest strategy, as demonstrated by the fact that the stock is well within the target region, these ad hoc adjustments prevent this scoring issue being met at this time. The score of 75 in 2013, with a condition, was based on TAC being set above the level of the inter-annual variation constraint within the harvest control rule. The condition stated that the agreed HCR should be used as the basis for annual TAC decision. Deviations should be avoided, but if present, should be fully justified. Continuous deviations should lead to re-evaluation of the HCR to allow for full compliance in future TAC decisions.	
Pelagic Freezer Trawler Association North Sea herring	70	The score of 70 in 2011, with a condition was based entirely on the failure to implement the +/- 15 % change rule in the management plan in setting the TAC in 2011. As a result of the Condition the problem has been discussed both by ICES and the EU Norway. The situation arises because of the recent increase in stock size and the response of the	

		unresolved conflict within the management plan between the +/- 15% rule and exploitation well within management plan and MSY targets.	
Scottish Pelagic Sustainability Group Ltd North Sea herring	75	The fishery failed to meet scoring issue a at SG 80 because of the intention of the harvest control rules (Management Plan) to limit annual changes in the TAC to no greater than +/- 15%. Because of the increasing stock size this element of the Management Plan has been regularly overridden in recent years and TAC increases of greater than 15% have been agreed. The team did accept that the harvest control rules were broadly working to maintain stock size consistent with the harvest strategy. However the ad hoc adjustments to the rule prevented the fishery achieving the SG 80 element of this scoring issue. *As noted above we conclude that the team did not take sufficient account of the effectiveness of the harvest strategy in achieving exploitation rates below both Management Plan and FMSY levels in spite of not adhering to the +/- 15% TAC change rule in the Management Plan.*	
Hastings Fleet Herring Drift Net Fishery	75	The score of 75 in 2012 was also based on the failure to implement the +/- 15 % change rule in the management plan in setting the TAC in 2011. That team also took into consideration the past record of the fishery in overshooting the agreed TAC.	

PI 2.5.2: There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function

Fishery	Score	Rationale	Justification of difference
Norway North Sea & Skagerrak herring	100	2.5.2a: The strategy is to establish a marine environment and sustainable resources to make a full and long-term contribution to the Norwegian economy. The Norwegian Marine Resources Act has an explicit requirement to take an ecosystem approach to resource management and exploitation. The act provides the statutory basis for the suite of regional seas management plans, each aimed at monitoring and safeguarding the status of the marine environment and the resources it supports. It is implicit in the IMR long- term objective for developing a Norwegian ecosystem model that there is a plan to manage Norwegian fisheries, not the least of which is the NS&SH fishery, and maintain the stocks at levels consistent with the Norwegian strategy for rational utilization of all their marine resources.	The strategic approach to fishery management, sustainable exploitation and protection of the Marine environment for the Norway North Sea and Skagerrak fishery is very well developed, and a score of 100 is fully justified. The same level is not achieved by the other fisheries, as the assessment teams have found that there either is no formalized strategy in place or that the strategy does not have the same ecosystem approach.
SPFPO Swedish North Sea herring	80	**"**However, a comprehensive and integrated strategy that includes all different part of the ecosystem when managing the herring fisheries has not been implemented. This prevents the fishery from meeting SG100."	
Danish Pelagic Producers Organisation North Sea herring	80	.."The plan does, however, not address potential indirect impact the removal of herring may have on lower trophic levels of the ecosystem. Therefore a score more than 80 is not jusitified."	
Scottish Pelagic Sustainability Group Ltd North Sea herring	80	…"There is no evidence that the recent request for ICES to re-evaluate the management plan has highlighted the need for any particular ecosystem objectives – other than to maximize long term yield for the target stock. Clearly at this time when there is likely to be a revision of the HCR there is a clear opportunity to agree and state more explicitly the stated intent of management in terms of wider ecosystem interactions – ideally even exploring how this may be well defined and measurable."…	
Hastings Fleet Herring Drift Net Fishery	80	2.5.2a: No formalized strategy is in place.	

PI 3.1.4 The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing

Fishery	Score	Rationale	Justification of difference
Norway North Sea & Skagerrak herring	100	The management system provides for negative incentives designed to prevent fishers from violating regulations (see 3.2.3 on the enforcement system for details), designed to meet the outcomes expressed by MSC Principles 1 and 2 (see 3.1.3 and 3.2.1 on the objectives of the general and fishery-specific management systems, respectively). These incentives are subject to regular internal review of enforcement policies. A risk-based framework aimed at utilizing resources to optimize compliance at any given moment is applied, implying that priorities are regularly amended. Positive incentives include support for research on e.g. gear improvements (the CRISP programme) and for the transport of fish from vessels in the country's remote areas to statutory landing points. The management system does not include any subsidies that contribute to unsustainable fishing or ecosystem degradation. Subsidies to the fishing fleet were terminated in 1990 following the agreement between the European Free Trade Area signatories, negotiated in preparation of the European Economic Area Agreement. The assessment team concluded that there is reasonable evidence that incentives are explicitly considered and subject to regular review at both the national and international levels through review of enforcement policies and regular review of the CFP.	The assessment team found that there is reasonable evidence that incentives are explicitly considered and subject to regular review at both the national and international levels. This score is well supported by the Norwegian management system.
SPFPO Swedish North Sea herring	80	The assessment team concluded that, overall, within the context of the EU CFP, explicit consideration of incentives is not yet included in regular review although the assessors do conclude that the management system provides for incentives and seeks to ensure that negative incentives do not arise.	
Scottish Pelagic Sustainability Group Ltd North Sea herring	80	The assessment team concluded that, overall, within the context of the EU CFP, explicit consideration of incentives is not yet included in regular review although the assessors do conclude that the management system provides for incentives and seeks to ensure that negative incentives do not arise.	
Hastings Fleet Herring Drift Net Fishery	80	The assessment team concluded that there was no evidence provided that incentives are explicitly considered in a regular review.	

MSC FISHERY ASSESSMENT REPORT

PI 3.2.5 There is a system of 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.

Fishery	Score	Rationale	Justification of difference
Norway North Sea & Skagerrak herring	100	a: All parts of the management system are subject to evaluation b: The fishery-specific management system is subject to internal review at regular internal self-evaluation meeting within the Norwegian bodies of governance. It is also subject to a number of mechanisms for regular external review.	The Norway NS&S herring fishery meets SG 100 criteria, while it is not clear to the assessment team why three of the other fisheries have not been granted a score of 100 to this PI. The Hastings Fleet Herring Drift Net fishery clearly demonstrates that review of the management system as a whole is neither systematic nor regular, thus failing to meet SG 100 criteria.
SPFPO Swedish North Sea herring	80	Not clear from scoring table why 100 is not granted	
Pelagic Freezer Trawler Association North Sea herring	80	Not clear from scoring table why 100 is not granted	
Scottish Pelagic Sustainability Group Ltd North Sea herring	80	Not clear from scoring table why 100 is not granted	
Hastings Fleet Herring Drift Net Fishery	80	a: Although various (and more urgent) elements of the management system are subject to review, there is no systematic review of the system as a whole. b: There is no regular internal and external review process for the whole system.	

4.2 Previous assessments

The fishery was assessed and certified in April 2009. The full assessment was based on assessment tree defined by the responsible CAB and had four conditions. All conditions from the full assessment are fully met (Table 23).

Table 23 Summary of Previous Assessment Conditions

Condition	Closed? (Y/N)	Justification
Condition 1. Slippage Slippage of catches and subsequent mortality may be higher than currently considered by the industry. The practice must be actively discouraged throughout both the trawl fleet (where subsequent mortality is 100%) and the purse seine fleet (where post slippage mortality is likely to be high). Slippage of catches should be kept to as near zero as possible although it is recognised that this may be difficult to achieve for operational and safety reasons. Vessels must record all slippage events with their best estimates of the species mix, quantity released and condition of the school on release. Reporting programmes should be initiated to provide comprehensive and verifiable estimates of the extent of this form of discarding of the target species and the by-catches of other species. Information should be sufficient to allow statistically robust estimates of quantity, location and date and to allow an assessment of the impacts of slippage in relation to the distribution, ecology and abundance of the populations affected. The client should seek to cooperate with scientists in the investigation of slippage mortality by active support of research programmes and observer coverage.	Y	**Action 1:** The client has provided documentary evidence requesting the Directorate of Fisheries to expand the electronic logbook recording system to include records of slipped catches. The DoF is not inclined to act on this request as it prefers to seek solutions to the problem (through CRISP) rather than just record it. **Action 2:** In consultation with IMR and DoF, and underpinned by new fishery regulations, all client purse seines are fitted with a 'point-of-no-return' marker buoy as an aide to minimising slipping-related mortalities. IMR embarks observers on a reference fleet comprising up to seven of the client's vessels; observers undertake biological sampling and gather detailed information on catches, including slipped catches and non-commercial species. The IMR– NINA joint monitoring programme will enhance bycatch records by including seabirds. **Action 3**: The DoF is satisfied that the vessels covered by this certification are fully compliant with the management of this fishery and IMR is equally satisfied with the support they receive with respect to research and development (CRISP). The data collected from client vessels, including the reference-fleet vessels, contribute to the ICES stock assessments. While bycatch data

		hitherto have been limited to that gathered by the reference-fleet observers, for the past 12 – 24 months the DoF have been introducing the mandatory use of electronic logbooks upon which all fish, commercial and non-commercial, birds and mammals must be recorded. When these data become available they will enhance the overall quality of assessments considerably. In the meanwhile, ICES has found that, "evidence from observer programmes suggest that discarding [including slipping] of mackerel is not wide-spread and bycatch of birds, sea mammals and ETP species in general is low". On the basis of this assessment, ICES has not identified any specific additional action is necessary with respect to discarding (or slipping). From this, it can be inferred that the requirement of action point 3 has been met. From the status of the above 3 action plans it can be concluded that this condition is closed satisfactorily.
Condition 2. Record discards/slippage of herring in other pelagic fisheries Action required: It was noted that there may be slippage (and probably subsequent mortality) of herring in other pelagic fisheries, notably the mackerel fishery. Provisions under Condition 1 should be extended to other Norwegian pelagic fisheries over the same timescale	Y	As for Condition 1
Condition 3. Development and implementation of appropriate stock rebuilding or sustainable harvest strategy. Action required: Proposals have been advanced by WKHMP for a move to an F based management regime and Management Plan which would be precautionary under the current stock recruitment regime. These, or other	Y	Data from ICES advice ($ACOM_{ns\&sh}$, 2013) indicate that the North Sea Herring stock has stabilised, has full reproductive capacity and is being harvested sustainably and below management plan target levels. No further action is required from the client and it can be concluded that this condition is satisfactorily closed.

appropriate precautionary proposals, should be adopted. Norges Sildesalgslag should therefore provide active support for an appropriate management plan. Evidence of such support through, for example, representations to Norwegian authorities should be demonstrated. Until such time, any TAC's adopted should be consistent with precautionary harvest of the stock (F below Fpa). It is noted that in 2008 F is 0.2, which is the proposed new target F and below current Fpa 0.25.		
Condition 4. By-catches Action required: Sampling programmes should be initiated to provide statistically robust estimates of the by-catch of all species, including estimates of discards. Information should be sufficient to allow an assessment of the impacts of by-catches in relation to the distribution, ecology and abundance of the species and populations affected (commercial and non-commercial fish, mammals and birds). The potential impact of non-target species removals on the populations affected and the wider ecosystem should be evaluated. Where assessments of impacts on by-catches are shown to be significant, and for all species identified as PET, appropriate measures to reduce by-catches to acceptable and precautionary levels shall be developed and implemented.	Y	As for Condition 1.

4.3 Assessment Methodologies

The basis for the MSC-certification is the standard denoted as the "MSC Principles and Criteria for Sustainable Fisheries", organised in three main principles. Principle 1 concentrates on the need to maintain the target stock at a sustainable level; Principle 2 draws attention to maintaining the ecosystem in which the target stock exists, and Principle 3 addresses the requirement for an effective fishery management system in order to fulfil Principles 1 and 2. In addition Principle 3 takes into account national and international regulations. The Principles 1-3, with pertaining criteria, are presented below.

The assessment team used the default assessment tree as defined in the MSC Certification Requirements v1.3 without any modifications. The MSC Full Assessment Reporting Template V1.3 is used for this report.

PRINCIPLE NUMBER 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[65]:

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.

Criteria:

- The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
- Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
- Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

PRINCIPLE NUMBER 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.

Criteria:

1) The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2) The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.
3) Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time

[65] The sequence in which the Principles and Criteria appear does not represent a ranking of their significance, but is rather intended to provide a logical guide to certifiers when assessing a fishery. The criteria by which the MSC Principles will be implemented will be reviewed and revised as appropriate in light of relevant new information, technologies and additional consultations.

frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

PRINCIPLE NUMBER 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.

Part A: Management System Criteria

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. Demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process.
3. Be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings.
4. Observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability.
5. Incorporates an appropriate mechanism for the resolution of disputes arising within the system[66].
6. Provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing.
7. Act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty.
8. Incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion.

[66] Outstanding disputes of substantial magnitude involving a significant number of interests will normally disqualify a fishery from certification.

9. Require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted.
10. Specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
    1. Setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species.
    2. Identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.
    3. Providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames.
    4. Mechanisms in place to limit or close fisheries when designated catch limits are reached.
    5. Establishing no-take zones where appropriate.
11. Contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

Part B: Operational Criteria

Fishing operation shall:

12. Make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive.
13. Implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.
14. Not use destructive fishing practices such as fishing with poisons or explosives.
15. Minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.
16. Be conducted in compliance with the fishery management system and all legal and administrative requirements.
17. Assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

The MSC Principles and Criteria presented above set the requirements for the fishery that undergoes certification. MSC's certification methodology is based on a structured hierarchy of *Sub-criteria* and *Performance indicators*. The overall performance is decided on the basis of the scoring criteria that the fishery gets during assessment. These sub-criteria and performance indicators have been developed by the MSC in the form of a default assessment tree.

When a fishery is evaluated the performance indicators (normally specific statements or questions) are checked out, and each performance indicator has three different "scoring guideposts" that can be defined. MSC characterises these scoring points as follows:

- Perfect practice, representing the level of performance that would be expected in a theoretically 'perfect' fishery (100 points).
- Exemplary or best practice (80 points).
- Minimum sustainable practice (60 points).

An overview of the assessment methodology is given in Marine Stewardship Council Certification Requirements v 1.3 and Guidance to the MSC certification requirements v 1.3. This guidance illustrates how the MSC Principles and Criteria give a basis for sub-criteria and performance indicators defined by DNV, resulting in various scores for the fishery.

4.4 Evaluation Processes and Techniques

Site visits to the fishery were performed by the certification body (here DNV) and the assessment team and consultations were done with interested stakeholders. The performance indicators and the pertaining scoring systems were evaluated, and it was judged if the fishery meets the requirements for MSC certification.

In order to fulfil the requirements for certification the following minimum scores are required:

- The fishery must obtain a score of 80 or more for each of the three MSC Principles, based on the weighted aggregate scores for all Performance Indicators under each Criterion in each Principle.
- The fishery must obtain a score of 60 or more for each Performance Indicator under each Criterion in each Principle.

Even though a fishery fulfils the criteria for certification, there may still be some important potential risks to future sustainability that are revealed during assessment. These are performance indicators that score less than 80, but more than 60. In order to be granted a MSC fishery certificate the client must agree to further improvements to raise the score to 80. The certification body (here DNV) then sets a timescale for the fishery to improve the relevant areas, so that the certification process can continue.

Default performance indicators and the scorings allocated in the evaluation are enclosed in chapter 6.2.

4.4.1 Site Visits

Relevant stakeholders were visited in June 2013 as outlined in Table 24. The site visit was combined with surveillance acitivities of other Norwegian fisheries. Information gathered is presented in this report and in the enclosed scoring tables.

Table 24 Site visits conducted and key issues discussed.

Name	Affiliation	Date	Key Issues
Thorbjørn Thorvik, Senior advisor Geir Blom, Senior advisor	Directorate of Fisheries	24 June 2013	• Function, role and responsibility of the organization • Review of regulations for the fisheries under assessment in the relevant geographical area • Control, surveillance and monitoring routines applied to fisheries under assessment • Fishermen's compliance with regulations. Significant non-compliances found during inspections in 3 preceding years. • Observed fishing patterns (gear used, fishing area, fleet composition, fishing season). • Level of discards in cod and haddock fisheries. • VMS data for the fleet of the fisheries under assessment in the last fishing year
Tom Williams, Reference fleet responsible Bjarte Bogstad, Scientist Gjert Dingsør, Scientist Cecilie Kvamme, Scientist Svein A. Iversen, Scientist Aril Slotte, Scientist	Institute of Marine Research	24 June 2013	• Function, role and responsibility of the institution • Role in stock assessments • Sampling programmes and level of sampling, surveys • Integration of national data collection programmes and stock assessments with ICES assessments. • Stock status, stock structure and recruitment of the fisheries under assessment • Review of Limit and Target reference points established for the stocks • Harvest strategy and harvest control rules • Short-term and long-term management objectives for the countries' fisheries, incl. the fisheries under assessment • Monitoring programmes for non-target species • Level of discards (composition of species, quantities) • Level of by-catch (composition of species, quantities) • Monitoring programmes for ETP species. Can extent of interactions with ETP species be quantified? • Strategy for minimising/ eliminating ETP/ by-catch • Impact of cod and haddock fisheries on marine habitats. Does the fishery overlap with sensitive habitats? Which habitats are protected/ closed? • Strategy/ plans for protection of sensitive habitats • Impact of the fisheries under assessment on

			the ecosystem. • Ecological role of the fisheries under assessment on the stocks • Ecosystem surveys in the Geographical area • Strategy in scientific research. Research programmes for the fisheries under assessment, and other important species.
Knut Torgnes, Sales Director	Norges Sildesalgslag	24 June 2013	Basic info about the company: • Ownership • History • Organizational structure • Roles and responsibilities in MSC Fisheries certification process Review of fishing operations: • Fishing season • fishing areas • gear used (specifications) • Historical fishing levels per area (quotas/ catches of cod and haddock) Review of impact on ecosystem: • List of all by-catch fish species: (species and quantities 3 preceding years) • By-catch of marine mammals, ETP species, birds: (species and quantities) • List of commercial/non-commercial species which are usually discarded (quantities/if known) • Loss of fishing gear, and recovery • Does the fishery overlap with sensitive habitats? Which habitats are protected/ closed in the fishery area? Compliance with rules and regulations: • Control, surveillance and monitoring routines/regulations applied to the *fishery/ geographical area* • Disputes with national/ international authorities for the last 5 years. • Records of sanctions and penalties in 2011, 2012, 2013 (if any). Chain of Custody start: • Review of traceability system on board and at landing • Labelling of products • First point of landing • First point of sale • Main products • Main markets
Elisabeth N. Gabrielsen, Deputy director general Paul Oma, Senior	Norwegian Ministry of Fisheries and Coastal affairs	25 June 2013	• Function, role and responsibility • Strategy of the institution • Harvest strategy for cod and haddock fisheries • Short-term and long-term management objectives for the countries fisheries, incl. the

advisor Geir Ervik, Senior advisor			fisheries under assessment • Precautionary approach in management of marine resources • Consultation and decision-making process for the stocks of the fisheries under assessment • Stakeholder involvement in decision-making. • Review of regulations for the fisheries under assessment in the relevant geographical area • Control, surveillance and monitoring routines/regulations applied to the fisheries under assessment in the relevant geographical area • Logbooks: recording of non-commercial species • Fishermen's compliance with laws and regulations. Significant discrepancies found at landing control for the fisheries under assessment in the 3 preceding years • Quota and level of catches (3 preceding years) • Observed fishing patterns (gear used, fishing area, fleet composition, fishing season). • Level of discards in the fisheries under assessment • VMS data for the fisheries under assessment
Jan Birger Jørgensen, deputy director general	Norges Fiskarlag	25 June 2013	Basic info about the company: • Ownership • History • Organizational structure • Roles and responsibilities in MSC Fisheries certification process Review of fishing operations: • Fishing season • fishing areas • gear used (specifications) • Historical fishing levels per area (quotas/ catches of cod and haddock) Review of impact on ecosystem: • List of all by-catch fish species: (species and quantities 3 preceding years) • By-catch of marine mammals, ETP species, birds: (species and quantities) • List of commercial/non-commercial species which are usually discarded (quantities/if known) • Loss of fishing gear, and recovery • Does the fishery overlap with sensitive habitats? Which habitats are protected/ closed in the fishery area? Compliance with rules and regulations:

	• Control, surveillance and monitoring routines/regulations applied to the fishery/ geographical area • Disputes with national/ international authorities for the last 5 years. • Records of sanctions and penalties in 2011, 2012, 2013 (if any). Chain of Custody start: • Review of traceability system on board and at landing • Labelling of products • First point of landing • First point of sale • Main products • Main markets

4.4.2 Consultations

Several stakeholders have been identified and contacted in connection with the assessment of the Norway North Sea and Skagerrak herring fishery assessment. Relevant stakeholders were interviewed in June 2013 as outlined in Table 24. Information gathered is presented in this report and in the enclosed scoring tables. Information was also made publicly available at different stages of the assessment as outlined in Table 25.

Table 25 Consultations at different stages of the assessment.

Date	Information	Media
2nd April 2013	Notification of Full assessment	Direct E-mail/letter Notification on MSC website
2nd April 2013	Notification of Assessment Team	Direct E-mail Notification on MSC website
16th April 2013	Confirmation of Assessment Team	Direct E-mail Notification on MSC website
16th April 2013	Announcement of default assessment tree	Direct E-mail Notification on MSC website
Week 17 2013	Advertisement of certification + Invitation to contribute to assessment process	Advertisement on www.intrafish.com and in "Fiskeribladet Fiskaren"
24th April 2013	Stakeholder Notification: Site Visit scheduled	Direct E-mail Notification on MSC website
16th May 2013	Stakeholder Notification: Change of Client	Direct E-mail Notification on MSC website

18th July 2013	Exemption to the requirements for IPI stocks: Western Baltic spring spawning herring taken in the Skagerrak and eastern North Sea	Direct E-mail
29th August 2013	Notification of Proposed Peer Reviewers	Direct E-mail Notification on MSC website
17th September 2013	Notification of Confirmed Peer Reviewers	Notification on MSC website
8th January 2014	Variation for certificate extension	Direct E-mail Notification on MSC website
5th February 2014	Revised notification of peer reviewers	Direct E-mail Notification on MSC website
11th February 2014	Revised timeline	Direct E-mail Notification on MSC website
28th February 2014	Confirmation of revised peer reviewers	Direct E-mail Notification on MSC website
18th February 2014	Notification of changes to assessment team	Direct E-mail Notification on MSC website
11th March 2014	Confirmation of revised assessment team	Direct E-mail Notification on MSC website
20th/21st March 2014	Notification of Public Comment Draft Report	Direct E-mail / Notification on MSC website
	Notification of Final Report	Direct E-mail Notification on MSC website

4.4.3 Evaluation Techniques

The full assessment was publicly announced on www.intrafish.com and advertised in Fiskeribladet Fiskaren, a Norwegian industry sector publication widely read by fishery stakeholders in Norway.

Site visits to the fishery were performed by the certification body (here DNV) and the assessment team and consultations were done with interested stakeholders as listed in Table 24. The performance indicators and the pertaining scoring systems were evaluated jointly by the assessment team and all scoring was based on unanimous conclusions by the entire team.

In order to fulfill the requirements for certification the following minimum scores are required:

- The fishery must obtain a score of 80 or more for each of the three MSC Principles, based on the weighted aggregate scores for all *Performance Indicators* under each *Criterion* in each *Principle*.
- The fishery must obtain a score of 60 or more for each *Performance Indicator* under each *Criterion* in each *Principle*.

Even though a fishery fulfills the criteria for certification, there may still be some important potential risks to future sustainability that are revealed during assessment. These are performance indicators that score less than 80, but more than 60. In order to be granted a MSC fishery certificate the client must agree to do some further improvements regarding these points. The certification body (here DNV) sets a timescale for the fishery to improve the relevant areas, so that the certification process can continue.

The Norway North Sea and Skagerrak herring fishery achieved a score of 80 or more for each of the three MSC Principles, and did not score under 60 for any of the set MSC Criteria. The assessment team therefore recommends the certification of the Norway North Sea and Skagerrak herring fishery for the client Norwegian Fishermen's Association.

Default performance indicators and the scorings allocated in the evaluation are enclosed in chapter 6.2. The set of scoring elements that have been considered in each outcome PI in Principles 1 and 2 are included in Table 26.

Table 26 Scoring elements (for both purse seine and pelagic trawl)

Component	Scoring elements	Main/not main	Data-deficient or not
2.1.1 Retained species	Mackerel	Not main	Not data-deficient
2.1.1 Retained species	Norway pout	Not main	Not data-deficient
2.1.1 Retained species	Horse mackerel	Not main	Not data-deficient
2.1.1 Retained species	Saithe	Not main	Not data-deficient
2.1.1 Retained species	Blue whiting	Not main	Not data-deficient
2.1.1 Retained species	Sprat	Not main	Not data-deficient
2.1.1 Retained species	Whiting	Not main	Not data-deficient
2.1.1 Retained species	North Sea haddock	Not main	Not data-deficient
2.1.1 Retained species	Northern hake	Not main	Not data-deficient
2.1.1 Retained species	North Sea cod	Not main	Not data-deficient
2.1.1 Retained species	Western Baltic Spring spawning herring	Not main	Not data-deficient

4.4.4 Risk based framework

The RBF has not been used for the assessment of the Norway North Sea and Skagerrak herring fishery.

5 Traceability

5.1 Eligibility Date

(REQUIRED FOR PCR ONLY)

1. The report shall include: a. The actual eligibility date. b. The rationale for any difference in this date from the target eligibility date

The target eligibility date is 29. July 2014. This is the expiry date of the certificates granted after the initial certification of the Norway North Sea and Skagerrak herring fishery, after variation on certificate extension granted by MSC.

5.2 Traceability within the Fishery

As described in section 3.5, monitoring, control and surveillance is taken care of thorough shared responsibility and close collaboration between the Directorate of Fisheries, the Coast Guard and the regional sales organizations. Coast Guard inspectors board fishing vessels and control the catch (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds. Norwegian vessels are required to have electronic logbooks, where real-time catch data are forwarded to the Directorate of Fisheries. The Directorate of Fisheries keeps track of how much fish is taken of the quotas of different vessels, vessel groups or other states at any given time, based on reports from the fishing fleet. The self-reported catch data can be checked at sales operations through the sales organizations, which have monopoly on first-hand sale of fish in Norway, and through physical checks performed by the sales organizations, the Directorate of Fisheries and the Coast Guard.

The sales organizations are required to record all landings of fish in Norway. This information is compared to the figures provided by the vessels to the Directorate of Fisheries through the electronic logbook. Physical controls of landings are carried out both by inspectors from the sales organizations and DoF.

Catch certificate is mandatory for export to EU. Norges Sildesalgslag has the responsibility for the catch certificate for all Norwegian fisheries through a separate company (Catch Certificate SA, https://www.catchcertificate.no/). The catch certificate accompanies the delivery note from the vessel. Buyers can access and extract catch certificates electronically.

Fish is mainly sold through auctions. There are exceptions for catches less than 50 tonnes, where agreements can be made directly with buyer, but the same requirements for reporting apply. All transactions are done through the client, logged and publically available. All relevant information on catch is provided to the client on a pre-delivery note. Vessel will complete the pre-filled delivery note and set correct quantity and size distribution in accordance with requirements from DoF. After landing, the delivery note is signed

electronically and sent to the client for invoicing and settlement to fishermen. Purchaser name is included in the delivery note. The current list of approved buyers in Norway can be accessed at http://www.fiskeridir.no/register/kjoperreg/, but eligible buyers outside of Norway are also permitted to buy the certified product. Fishery certificate number is provided on invoices, and invoices are issued through Norges Sildesalgslag. The fish changes ownership from vessel to processing plant.

Main products are processed and packed herring. Some quantities are sold as fillets and as whole round-frozen fish. Main markets for Norway North Sea and Skagerrak herring is EU (Germany, Denmark, Netherlands and Poland), with occasional exports to Nigeria.

All vessels are monitored by the Directorate of Fisheries through VMS data. The client has access to tracking data, and organizational and peer pressure in addition to official control contributes to minimizing the possibility of fishing outside the unit of certification. Norwegian vessels do only fish on the two Norwegian herring fisheries, Norway spring spawning herring and Norway North Sea and Skagerrak herring. There is a temporal and spatial separation between these two fisheries. Catch from different quota zones are stored in separate tanks and reported separately. Catches from certified fisheries area identified through fishery certificate number on invoices, which are issued through Norges Sildesalgslag.

At sea processing and trans-shipping
Most herring is landed as round fish after being chilled on refrigerated seawater tanks or frozen. There was no at-sea processing Norway North Sea and Skagerrak herring in 2013. There have been no incidences of trans-shipping in this fishery or the past few years.

Points of landing
Landing sites are mainly in Norway, with inspections by DoF and sales organization as described above. Product may also be landed outside of Norway, e.g. in Denmark, Scotland and Shetland. In these cases, landing information is transmitted to Norwegian Authorities who cooperate with national control bodies at points of landing to ensure correct information.

5.3 Eligibility to Enter Further Chains of Custody

Product landed by Norwegian vessels from the Norway North Sea and Skagerrak herring fishery is being accurately recorded and identified through the Directorate of Fisheries and sales organisation as described above. Product from the certified fishery is therefore eligible to enter further Chain of Custody.

Products may be sold through auction arranged by the sales organisation or directly. To be eligible to carry the MSC logo, fish must enter into separate MSC Chain of custody certification commencing sale.

5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody

Western Baltic spring spawning herring (WBSSH) can be defined as IPI catches under MSC CR v1.3 27.4.9, as they are practically inseparable from the target stock of North Sea herring during normal fishing operations, they comprise less than 15% of the overall catch, they are not certified separately and they are not ETP species. Post landing estimation of the proportions of each stock component in the catches is made by biological sampling, which indicates that WBSSH catches are a very small (<1.5% - i.e 1103 t) percentage of the total Norwegian catch of North Sea herring (estimated at 75,591 t – based on a three-year average 2010–12 on data from Table 2.1.6 “The Wonderful Table” in the ICES Herring Assessment Working Group Report 2013). The very small catches from this fishery means that they do not negatively impact the overall stock. The current SSB for this stock is at 87,936 t and the agreed TAC has not been exceeded since 2010. The status of the WBSSH stock remains stable at or about Blim and although F is higher than Fmsy, it has been declining steadily over the past 5-6 years. Although, there is no formally agreed management plan, the ICES precautionary advice has been adopted as the basis for the EU–Norway management of this fish stock.

A variation to the MSC Certification Requirements CR 27.4.10 and CR B 27.4.10.1 to allow for an exemption to the requirements for IPI stocks for this fishery was granted by MSC on July 18th 2013. Details of the certificate of variation, that WBSSH are exempt from the IPI requirements and that they will be entering the Chain of Custody from this fishery should the fishery pass certification, was sent to all stakeholders on July 18th 2013. Variation request and variation responses are included in Appendix 12.

The Baltic herring catches will thus ultimately enter chains of custody along with the NS herring should the fishery pass certification, but the proportion is very low. The Baltic herring catches are scored under the PI 2.1 (Retained species).

6 Evaluation Results

6.1 Principle Level Scores

Table 27 Final Principal Scores

Final Principle Scores		
Principle	**Purse seine**	**Pelagic trawl**
Principle 1 – Target Species	96,3	96,3
Principle 2 – Ecosystem	94,3	94,7
Principle 3 – Management System	96,1	96,1

6.2 Summary of Scores

Summary of scores for purse seine and pelagic trawl are provided in tables below.

MSC FISHERY ASSESSMENT REPORT

Fishery Assessment Scoring Worksheet version 1 - effective November 14, 2011

NORTH SEA & SKAGERRAK HERRING FISHERY- PURSE SEINE

Note: Scores are to be entered in the green-shaded cells in column K
Columns G, H and L apply in fisheries where the stock rebuilding PI (1.1.3) is NOT triggered
Columns I, J and M give the Principle 1 Outcome score contributions in fisheries where the stock rebuilding PI (1.1.3) is triggered

Prin-ciple	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3) Either	Weight in	Or		Score	Contribution to Principle Score Either	Or
One	1	Outcome	0,5	1.1.1	Stock status	0,5	0,25	0,333	0,1667	100	25,00	16,67
				1.1.2	Reference points	0,5	0,25	0,333	0,1667	100	25,00	16,67
				1.1.3	Stock rebuilding			0,333	0,1667			0,00
		Management	0,5	1.2.1	Harvest strategy	0,25	0,125			100	12,50	12,50
				1.2.2	Harvest control rules & tools	0,25	0,125			80	10,00	10,00
				1.2.3	Information & monitoring	0,25	0,125			90	11,25	11,25
				1.2.4	Assessment of stock status	0,25	0,125			100	12,50	12,50
Two	1	Retained species	0,2	2.1.1	Outcome	0,333	0,0667			90	6,00	
				2.1.2	Management	0,333	0,0667			90	6,00	
				2.1.3	Information	0,333	0,0667			85	5,67	
		Bycatch species	0,2	2.2.1	Outcome	0,333	0,0667			100	6,67	
				2.2.2	Management	0,333	0,0667			100	6,67	
				2.2.3	Information	0,333	0,0667			95	6,33	
		ETP species	0,2	2.3.1	Outcome	0,333	0,0667			100	6,67	
				2.3.2	Management	0,333	0,0667			95	6,33	
				2.3.3	Information	0,333	0,0667			85	5,67	
		Habitats	0,2	2.4.1	Outcome	0,333	0,0667			95	6,33	
				2.4.2	Management	0,333	0,0667			100	6,67	
				2.4.3	Information	0,333	0,0667			85	5,67	
		Ecosystem	0,2	2.5.1	Outcome	0,333	0,0667			95	6,33	
				2.5.2	Management	0,333	0,0667			100	6,67	
				2.5.3	Information	0,333	0,0667			100	6,67	
Three	1	Governance and policy	0,5	3.1.1	Legal & customary framework	0,25	0,125			85	10,63	
				3.1.2	Consultation, roles & responsibilities	0,25	0,125			100	12,50	
				3.1.3	Long term objectives	0,25	0,125			100	12,50	
				3.1.4	Incentives for sustainable fishing	0,25	0,125			100	12,50	
		Fishery specific management system	0,5	3.2.1	Fishery specific objectives	0,2	0,1			90	9,00	
				3.2.2	Decision making processes	0,2	0,1			90	9,00	
				3.2.3	Compliance & enforcement	0,2	0,1			100	10,00	
				3.2.4	Research plan	0,2	0,1			100	10,00	
				3.2.5	Management performance evaluation	0,2	0,1			100	10,00	

Overall weighted Principle-level scores		Either	Or
Principle 1 - Target species	Stock rebuilding PI not scored	96,3	
	Stock rebuilding PI scored		79,6
Principle 2 - Ecosystem		94,3	
Principle 3 - Management		96,1	

MSC FISHERY ASSESSMENT REPORT

Fishery Assessment Scoring Worksheet version 1 - effective November 14, 2011

NORTH SEA & SKAGERRAK HERRING FISHERY- PELAGIC TRAWL

Note: Scores are to be entered in the green-shaded cells in column K
Columns G, H and L apply in fisheries where the stock rebuilding PI (1.1.3) is NOT triggered
Columns I, J and M give the Principle 1 Outcome score contributions in fisheries where the stock rebuilding PI (1.1.3) is triggered

Prin-ciple	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in			Score	Contribution to Principle Score	
						Either		Or			Either	Or
One	1	Outcome	0,5	1.1.1	Stock status	0,5	0,25	0,333	0,1667	100	25,00	16,67
				1.1.2	Reference points	0,5	0,25	0,333	0,1667	100	25,00	16,67
				1.1.3	Stock rebuilding			0,333	0,1667			0,00
		Management	0,5	1.2.1	Harvest strategy	0,25	0,125			100	12,50	12,50
				1.2.2	Harvest control rules & tools	0,25	0,125			80	10,00	10,00
				1.2.3	Information & monitoring	0,25	0,125			90	11,25	11,25
				1.2.4	Assessment of stock status	0,25	0,125			100	12,50	12,50
Two	1	Retained species	0,2	2.1.1	Outcome	0,333	0,0667			90	6,00	
				2.1.2	Management	0,333	0,0667			90	6,00	
				2.1.3	Information	0,333	0,0667			85	5,67	
		Bycatch species	0,2	2.2.1	Outcome	0,333	0,0667			100	6,67	
				2.2.2	Management	0,333	0,0667			100	6,67	
				2.2.3	Information	0,333	0,0667			95	6,33	
		ETP species	0,2	2.3.1	Outcome	0,333	0,0667			100	6,67	
				2.3.2	Management	0,333	0,0667			95	6,33	
				2.3.3	Information	0,333	0,0667			85	5,67	
		Habitats	0,2	2.4.1	Outcome	0,333	0,0667			95	6,33	
				2.4.2	Management	0,333	0,0667			100	6,67	
				2.4.3	Information	0,333	0,0667			90	6,00	
		Ecosystem	0,2	2.5.1	Outcome	0,333	0,0667			95	6,33	
				2.5.2	Management	0,333	0,0667			100	6,67	
				2.5.3	Information	0,333	0,0667			100	6,67	
Three	1	Governance and policy	0,5	3.1.1	Legal & customary framework	0,25	0,125			85	10,63	
				3.1.2	Consultation, roles & responsibilities	0,25	0,125			100	12,50	
				3.1.3	Long term objectives	0,25	0,125			100	12,50	
				3.1.4	Incentives for sustainable fishing	0,25	0,125			100	12,50	
		Fishery specific management system	0,5	3.2.1	Fishery specific objectives	0,2	0,1			90	9,00	
				3.2.2	Decision making processes	0,2	0,1			90	9,00	
				3.2.3	Compliance & enforcement	0,2	0,1			100	10,00	
				3.2.4	Research plan	0,2	0,1			100	10,00	
				3.2.5	Management performance evaluation	0,2	0,1			100	10,00	

Overall weighted Principle-level scores		Either	Or
Principle 1 - Target species	Stock rebuilding PI not scored	96,3	
	Stock rebuilding PI scored		79,6
Principle 2 - Ecosystem		94,7	
Principle 3 - Management		96,1	

6.3 Summary of Conditions

The Norway North Sea and Skagerrak herring fishery did not achieve a score of less than 80 for any individual performance indicator and no conditions were set for the certification of the fishery.

6.3.1 Recommendations

No recommendations were set for the certification of the Norway North Sea and Skagerrak herring fishery.

6.4 Determination, Formal Conclusion and Agreement

(REQUIRED FOR PCR)

1. The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

The Norway North Sea and Skagerrak herring fishery achieved a score of 80 or more for each of the three MSC Principles, and did not score under 60 for any of the set MSC Criteria.

The assessment team therefore recommends the certification of the Norway North Sea and Skagerrak herring fishery for the client The Norwegian Fishermen's Association (Norges Fiskarlag).

6.5 Changes in the fishery prior to and since Pre-Assessment

The Norway North Sea and Skagerrak herring fishery has been monitored for compliance through initial assessment and concurrent surveillance activities in the previous certification period. Please see section 4.2 for details on previous assessments.

References

ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, **Book 1: 1.5.1.3**.
http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf

ACOM, 2009. The Barents Sea and Norwegian Sea: Ecosystem. ICES Advice Book 3.1.
http://www.ices.dk/committe/acom/comwork/report/2009/2009/Barents%20Sea%20Ecosystem%20overviews.pdf

$ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf

ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf

ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf

$ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES Advice Book 9.4.3.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf

$ACOM_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf

$ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf

$ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf

ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf

$ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf

$ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf

$ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf

ACOM$_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf

ACOM$_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5.
http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf

Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act)

Agreement between EU and Norway on the Management of Fish Stocks in the North Sea and Skagerrak, 1998

Agreement on the Long-term Management of the North Sea and Skagerrak Herring Stocks

AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf

Analyse av Norges avtaler og samarbeid med EU på fiskeriområdet, Rapport # 4, Oslo: Europautredningen, 2011.

Annual Report of the Coast Guard 2012

ATLANTIS; http://www.imr.no/temasider/modeller/atlantis/atlantis/en

Auditor General's Report No. 3:13 (2003–2004) on the Management of the Fish Resources

Auditor General's Report No. 3:2 (2007–2008) on the Management and Enforcement of the Fish Resources of the Barents Sea and the Norwegian Sea

Bjørge, Q. 2008. New research programme focusing on coastal and fjord ecosystems. Marine News 3–2008. http://www.imr.no/epigraph/filarkiv/hi_news_3_eng_web.pdf/nb-no

Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en

Breen, M., Isaksen, B., Ona, E., Pedersen, A.O., Pedersen, G., Saltskår, J., Svardal, B., Tenningen, M., Thomas, P.J., Totland, B., Øvredal, J.T., and Vold, A., 2012. A review of possible mitigation measures for reducing mortality in purse-seine fisheries. ICES Annual Science Meeting CM 2012/C:12. http://info.ices.dk/iceswork/asc/2012/themesessions/Abstracts%20Session%20c_ED.pdf (Abstract)

Burd, A.C. and Howlett, G.J. 1974. Fecundity studies on North Sea herring. J.Cons. int. Explor. Mer, 35 (2): 107-120. Fevrier 1974.

CRISP, 2013. CRISP Annual Report 2012. Institute of Marine Research, Bergen.
http://www.imr.no/filarkiv/2013/04/crisp_annual_report_2012_screen.pdf/en

Daan, N., Gislason, H., Pope, J.G. & Rice, J. 2005. Changes in the North Sea fish community:

evidence of indirect effects of fishing? ICES Journal of Marine Science, 62: 177–188. http://icesjms.oxfordjournals.org/content/62/2/177.full.pdf

Dickey-Collas, M., Nash, R.D.M., Brunel, T., van Damme, C.J.D., Marshall, C.T., Payne, M. R., Corten, A., Geffen, A.J., Peck, M.A., Hatfield, E.M.C., Hintzen, N.T., Katja Enberg6, Kell, L.T. & Simmonds, E. J. 2010. Lessons learned from stock collapse and recovery of North Sea herring: a review. ICES Journal of Marine Science, 67: 1875–1886

Dickey-Collas, M., Nash, R.D.M., Brunel, T., van Damme, C.J.D., Marshall, C.T., Payne, M. R., Corten, A., Geffen, A.J., Peck, M.A., Hatfield, E.M.C., Hintzen, N.T., Katja Enberg6, Kell, L.T. & Simmonds, E. J. 2010. Lessons learned from stock collapse and recovery of North Sea herring: a review. ICES Journal of Marine Science, 67: 1875–1886.

Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt med focus på fiske med garn og line. NINA Rapport 719.
http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf

Gezelius, Stig S. (2002), 'Do norms count? State regulation and compliance in a Norwegian fishing community', Acta Sociologica, 45, 305–314.

Harden Jones, F.R. 1968. Fish Migration. Edward Arnold, London. 325pp.

HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06.
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf

Hjøllo, S.S., 2007. EcoFish WP2 workandWind, NAO and ecosystem-selected articles. IMR, Bergen.
http://ecofish.imr.no/__data/page/6432/work_and_Wind,_NAO_and_ecosystem-selected_articles080307.pdf

Hønneland, Geir (2000/2013), *Coercive and Discursive Compliance Mechanisms in the Management of Natural Resources: The Case of the Barents Sea Fisheries*, Dordrecht: Springer

Hønneland, Geir (2012), *Making Fishery Agreements Work: Post-Agreement Bargaining in the Barents Sea*, Cheltenham: Edward Elgar

http://www.birdlife.org/seabirds/index.html

http://www.fisheries.no/resource_management/Resource-management/

http://www.imr.no/forskning/en

http://www.imr.no/forskning/forskningsdata/en

http://www.imr.no/forskning/programmer/okosystem_norskehavet/en

http://www.imr.no/forskning/programmer/okosystem_og_bestandsdynamikk/en

http://www.imr.no/temasider/referanseflaten/en

http://www.nina.no/ninaenglish/Publications.aspx

ICES 1996. Report of the Herring Assessment Working Group for the Area South of 62°N. ICES CM 1996/ACFM:10.

ICES 2005. Report of the Herring Assessment Working Group for the Area South of 62°N.8-17 March. ICES HQ. ICES CM 2005/ACFM:16. (599pp)

ICES, 2008. Report of the Workshop on Herring Management Plans (WKHMP). ICES CM 2008/ACOM:27

ICES, 2011a. Herring in Subarea IV and Divisions IIIa and VIId (North Sea autumn spawners). Advice May 2011. ICES Advice, Book 6, 11-26. Available from: http://www.ices.dk/committe/acom/comwork/report/2011/2011/her-47d3.pdf

ICES, 2011b. Report of the Working Group on multi-species assessments (WGSAM). ICES CM 2011/SSGSUE:10

ICES, 2011c. Report of the Workshop on the evaluation of the long-term management plan for North Sea autumn spawning herring. [WKHERMP]. ICES CM 2011/ACOM:55 (31pp)

ICES, 2011d. Joint EU-Norway request on interim advice on the North Sea herring management plan. Special request Advice November 2011. ICES Advice 2011, Book 6, 1-5. Available from: http://www.ices.dk/committe/acom/comwork/report/2011/Special%20Requests/EUNorway%20Interim%20advice%20on%20NS%20herring%20management%20plan.pdf

ICES, 2012a. Report of the Herring Assessment Working Group for the Area South of 62°N, 13- 22 March 2012. ICES CM 2012/ACOM:06.(835pp)

ICES, 2012b. Herring in Subarea IV and Divisions IIIa and VIId (North Sea autumn spawners). ICES Advice. May 2012 Book 6. (19pp). Available from: http://www.ices.dk/committe/acom/comwork/report/2012/2012/her-47d3.pdf

ICES, 2012c. Report of the Benchmark Workshop on Pelagic Stocks (WKPELA, 2012). 13-17 February. Copenhagen. ICES CM 2012/ACOM:47.(522pp)

ICES, 2012d Report of the Workshop for the Revision of Long Term Management Plans, WKHELP. ICES CM 2012 / ACOM:72

ICES, 2012e. Joint EU-Norway request to ICES on options to revise the long-term management plan for herring in the North Sea. ICES Special request November 2012. Book 6 Section 6.3.3.6. 11pp.

ICES, 2013a . Report of the Herring Assessment Working Group for the Area South of 62°N, 12 - 21 March 2013. ICES CM 2013/ACOM:06.(1270pp)

ICES, 2013b . Herring in Subarea IV and Divisions IIIa and VIId (North Sea autumn spawners). Advice May 2011. ICES Advice, Book 6, Sec 6.4.9. 19pp Available from: http://www.ices.dk/committe/acom/comwork/report/2013/2013/her-47d3.pdf

IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en

$IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en

Inspection records of the Directorate of Fisheries 2010–2012

Interviews with representatives of the Ministry of Fisheries and Coastal Affairs, Directorate of Fisheries, the Norwegian Fishermen's Association and the Fishermen's Sales Organization for Pelagic Fish during site visit

Jentoft & McCay: Jentoft, Svein and Bonnie J. McCay (1995), 'User participation in fisheries management', Marine Policy, 19, 227–246.

JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564

Kell, L. T., Mosqueira, I., Grosjean, P., Fromentin, J-M., Garcia, D., Hillary, R., Jardim, E., Mardle, S., Pastoors, M. A., Poos, J. J., Scott, F., and Scott, R. D. 2007. FLR: an open-source framework for the evaluation and development of management strategies. – ICES Journal of Marine Science, 64.

Kempf, A., Floeter, J., & Temming, A. 2006. Decadal changes in the North Sea food web between 1981 and 1991—implications for fish stock assessment. Canadian Journal of Fisheries and Aquatic Sciences, 63: 2586–2602.

Klif, 2012. Integrated management plan for the North Sea and Skagerrak. Norwegian Climate and Pollution Agency, Oslo. http://www.klif.no/english/english/Areas-of-activity/Integrated-management-plan-for-the-North-Sea-and-Skagerrak/

Lewy, P., and Vinther, M. 2004. A stochastic age–length-structured multispecies model applied to North Sea stocks. ICES Document CM 2004/FF: 20. 33 pp.

Lindstrøm, U., Smoutb, S., Howell, D. & Bogstad, B. 2009. Modelling multi-species interactions in the Barents Sea ecosystem with special emphasis on minke whales and their interactions with cod, herring and capelin. Proceedings of the ECONORTH Symposium on Ecosystem Dynamics in the Norwegian Sea and Barents Sea. Deep Sea Research 56, 2068–2079.

Mackinson, S., and Daskalov, G. 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Science Series Technical Report, Cefas Lowestoft, 142.

Meld.St. 49 (2012-2013) Fiskeriavtalane Noreg har inngått med andre land for 2012 og fisket etter avtalane I 2011 og 2012, Oslo: Ministry of Fisheries and Coastal Affairs.

MFCA, 2012. Integrated Management Plans available at:
http://www.fisheries.no/resource_management/Area_management/Integrated_management_plans/

MinEnv, 2009. Report No. 37 to the Storting (2008-2009) Integrated Management of the Marine Environment of the Norwegian Sea Report No. 37 (2008 – 2009) to the Storting.

Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, **41**. doi:10.1016/S0165-7836(99)00013-2

Nichols, J.H. 2001. Management of North Sea Herring and Prospects for the New Millennium. (pp 645- 655 in 'Herring: Expectations for a new millennium.' University of Alaska Sea Grant, AK-SG 01-04, Fairbanks. 800 pp.)

NORWECOM.E2E; http://www.imr.no/temasider/modeller/norwecom.e2e/norwecom.e2e/en

Olsen, E., Gjøsæter, H., Røttingen, I., Dommasnes, A., Fossum, P. & Sandberg, P. 2007. The Norwegian ecosystem-based management plan for the Barents Sea. ICES Journal 0f Marine Science 64: 599–602.

Patterson, K.R. 1998. Integrated Catch at Age Analysis Version 1.4. Scottish Fisheries Research Report. No. 38.

Patterson, K.R., Skagen, D, Pastoors, M and Lassen, H. 1997. Harvest control rules for North Sea herring. WD to ACFM 1997.

Payne MR. 2010 Mind the gaps: a state-space model for analysing the dynamics of North Sea herring spawning components. ICES Journal of Marine Science. 2010;67(9):1939-1947.

Payne, M. R., Hatfield, E. M. C., Dickey-Collas, M., Falkenhaug, T., Gallego, A., Gröger, J., Licandro, P., Llope, M., Munk, P., Röckmann, C., Schmidt, J. O., and Nash, R. D. M. 2009. Recruitment in a changing environment: the 2000s North Sea herring recruitment failure. ICES Journal of Marine Science, 66: 272–277

Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) (2006), *Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries*, Fisheries Centre Research Report Vol. 14 No. 2, Vancouver: University of British Columbia

Report to the Storting No. 37 (2008–2009) Integrated Management of the Marine Environment in the Norwegian Sea (management plan)

Report to the Storting No. 37 (2012–2013) Integrated Management of the Marine Environment in the North Sea and Skagerrak (Management Plan)

Report to the Storting No. 40 (2012–2013) On the Fishery Agreements that Norway has Concluded with Other States for 2013 and Fishery According to the Agreements in 2011 and 2012

Report to the Storting No. 8 (2005–2006) Integrated Management of the Marine Environment in the Barents Sea and Ocean Areas around Lofoten (management plan).

Simmonds, E. J. 2009. Evaluation of the quality of the North Sea herring assessment. ICES Journal of Marine Science, 66: 1814–1822.

Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf

Sparre, P. 1984. A computer program for estimation of food suitability coefficients from stomach content data and multipsecies VPA. ICES CM 1984/25.

Tjelmeland, S. & Lindstrøm, U. 2005. An ecosystem element added to the assessment of Norwegian spring spawning herring: implementing predation by minke whales. ICES Journal of Marine Science, 62, 285–294

Turrell, W. R., Henderson, E. W., Slesser, G., Payne, R. & Adams, R. D., 1992. Seasonal changes in the circulation of the northern North Sea. *Continental Shelf Research* **12**, 257–-286.

Vinther, M. 2001. Ad hoc multispecies VPA tuning applied for the Baltic and North Sea fish stocks. ICES Journal of Marine Science, 58: 311–320.

WGECO, 2012. Report of the Working Group on Ecosystem Effects of Fishing Activities (WGECO) ICES CM 2012/ACOM:26 http://www.ices.dk/reports/ACOM/2012/WGECO/wgeco_2012.pdf

WGECO, 2012. Report of the Working Group on the Ecosystem Effects of Fishing Activities. ICES CM 2012/ACOM:26. 192 pp.

WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf

WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf

WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf

WGRED, 2008. Report of the Working Group for Regional Ecosystem Description ICES CM 2008/ACOM:47. 203 pp.

WGSAM, 2009. Report of the Working Group on Multispecies assessment Methods. ICES CM 2009/RMC:10.

WGSAM, 2011. Report of the Working Group on Multispecies Assessment Methods. ICES CM 2011/SSGSUE:10. 229 pp.

WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf

$WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf

www.pelagic-rac.org

www.stockassessment.org

Appendices

Appendix 1 Scoring and Rationales

Appendix 1.1 Performance Indicator Scores and Rationale

Evaluation Table for PI 1.1.1

PI 1.1.1		**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely 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.
	Met?	Y	Y	Y
	Justification	The North Sea autumn spawning herring stock is currently more than three times the biomass limit reference point which was defined in 1997 as the minimum biologically acceptable level and redefined in 2008 as the level below which poor recruitment has been observed and can be expected. The stock is also currently well above the biomass precautionary reference point based on a 5% risk of SSB falling below the limit reference point. This difference affords a high degree of certainty that the stock is currently above the point where recruitment would be impaired.		
b	**Guidepost**		The stock is at or fluctuating around its target reference point.	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.
	Met?		Y	Y
	Justification	The North Sea autumn spawning herring stock is well above the biomass precautionary trigger reference point and also above the management plan upper trigger level. The SSB has been above that management plan target level since 2008 and only fell marginally below it in 2007 for the first time since 1997. The stock has therefore been at or fluctuating around its target reference point for the past 15 years. Changes to the assessment model in 2012 changed the perception of stock status and increased the estimates of SSB dating back over the whole time series. The new model does provide 95% confidence intervals on the estimates of SSB. The estimates at the lower confidence interval provide confidence, and a high degree of certainty, that the stock has been fluctuating around its target reference point or been above it in recent years		
References		Patterson et al, 1997; ICES, 2008, 2012b, 2012c, 2013b		

MSC FISHERY ASSESSMENT REPORT

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing			
Stock Status relative to Reference Points				
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**	
Target reference point	Management plan SSB trigger. Bpa F Management plan Fmsy	1.5 million tonnes 1.0 million tonnes F juv 0.05 F adult 0.25 F0.27 (0.24-0.3)	2.35 million tonnes F0.17	
Limit reference point	Bpa Blim	1.0 million tonnes 800,000 tonnes	2.35 million tonnes	
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generic 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.	
	Met?	Y	Y	
	Justification	Biological reference points, for biomass and fishing mortality have been defined and agreed since 1997 and are now embedded in a management plan endorsed by ICES. As a consequence of a new stock model for the stock assessment in 2012, and the changed perception of SSB, it was considered necessary to revisit the biological reference points. This was done by an ICES Workshop (WKHELP) in 2012 who recommended some changes which were subsequently endorsed by ICES in 2013. The reference points meet internationally agreed standards and have been endorsed by ICES as consistent with a precautionary approach to managing the stock		
b	**Guidepost**		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Y	Y
	Justification	The biomass limit point was set originally at the minimum biologically acceptable level (MBAL) defined in 1998 at 800,000 tonnes. This was based on the stock and recruitment relationship which shows that at SSB levels below this point poor recruitment can be expected. This reference point has been subject to thorough re-examination on a number of occasions, by ICES, the most recent in 2012. Each time the conclusion has been that the level is appropriate and robust to uncertainty. It should be noted that the recent period of below average recruitment has been experienced at a time of relatively high SSB. The biomass limit point forms an integral part of the EU / Norway management plan updated in 2008, and endorsed by ICES as being consistent with the precautionary approach. Some statistical re-examinations of the stock and recruitment relationship, excluding observations before the collapse of the stock in the 1970s, have suggested that the limit reference point could be lowered to 500,000 tonnes. In consideration of precautionary issues the limit has remained at 800,000 tonnes.		

MSC FISHERY ASSESSMENT REPORT

PI 1.1.2		**Limit and target reference points are appropriate for the stock**		
c	**Guidepost**		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	Y
	Justification	As a result of the re-examination of the reference points at an ICES Workshop in 2012 new reference points were put forward and endorsed by ICES in 2013. As an integral part of the EU / Norway management plan the stock is managed on fishing mortality targets as a surrogate for biomass targets. There are three levels of defined F within the management plan. Each level is related to the current state of the SSB in relation to the biomass limit level, 800,000t, and a management plan upper trigger level of 1.5 million tonnes. ICES notes that this biomass trigger point is a management point within the harvest control rule and not a biological reference point by which stock status can be judged. Fishing mortality is defined separately for juveniles (age 0-1 ringers) and adults (2-6 ringers) and reduces linearly as the biomass limit level is approached down to effectively zero if SSB falls below Blim. The fishing mortality MSY reference point based on stochastic simulations with the stock and recruitment relationship is set at F0.27 which is the mid-point of the calculated range from F0.24 - F0.3. This is marginally higher than the management plan F of 0.25 for adults when the SSB is above the management plan upper trigger level of 1.5 million tonnes. The management plan also addresses the fishing mortality on juveniles which is reduced in line with the reduction in fishing mortality on the adults. In this way the mortality on juveniles has been considerably reduced in recent years which clearly addresses the ecological role of the stock as a prey species. The new stock assessment model takes into account fundamental links between the North Sea ecosystem and the autumn spawning herring stock dynamics. The model now includes variable estimates of natural mortality derived from a multi species stock assessment model.		
d	**Guidepost**		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		NA	

PI 1.1.2		Limit and target reference points are appropriate for the stock
	Justification	Herring is considered by ICES as an important prey item for fish, birds and sea mammals and is also considered to compete with other North Sea stocks as a zooplankton and ichthyoplankton predator. These trophic interactions were taken into account for the first time in the assessment modelling process in 2012 through the adoption of time varying estimates of natural mortality. These estimates are based on state of the art multi species modelling which shows that natural mortality of herring in the North Sea is dominated by cod and saithe and that natural mortality is greater than fishing mortality. In that context it is deemed necessary for the assessment working group to keep the dynamics of these two species under careful review as both natural and anthropogenic changes can have an impact on the population dynamics of herring. There is clear evidence that herring in the North Sea and Skagerrak are a lower trophic level (LTL) species. However it is not considered to be a key LTL species because it does not meet at least two of the three sub- criteria in CB2.3.13 in Certification requiremnts v1.3. i)*A large proportion of the trophic connections in the ecosystem involve this stock, leading to significant predator dependency.* Ecosytem modelling of the North Sea (Mackinson and Daskalov, 2007) has shown that there are numerous other species which form important sources of prey for piscivorous fish. They are mackerel, horse mackerel, sprat, poor cod, Norway pout, sandeels blue whiting, Maurolicus and juvenile saithe and cod. ii) *A large volume of energy passing beween lower and higher trophic levels passes through this stock*. There are numerous other species of plantivores, most of which are listed above, through which energy passes from primary production through zooplankton to fish. iii) *There are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock (ie the ecosystem is 'wasp waisted'* As noted above there are numerous other prey species of planktivores which are abundant in the North Sea through which energy is passed to the top predators. Quite clearly the North Sea ecosystem is not 'wasp waisted' Further, historical, evidence for herring not meeting the requisite criteria for a key LTL species can be seen when the herring stock was close to extinction in the mid-1970s, there was no evidence of other species being adversely affected. Indeed, it can be argued that the trophic role of herring was simply replaced by other species, not the least of which was the concurrent expansion of the sprat and gadoid stocks. Whereas it appears that some bird populations may have an obligate dependence on juvenile sandeels, no comparable dependence has been identified for North Sea and Skagerrak herring.
References		Lewy and Vinther, 2004; Mackinson and Daskalov, 2007; ICES, 2008, 2011b, 2011c, 2012c, 2012d, 2013a, 2013b.

OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 1.1.3

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	NA		NA
	Justification			
b	**Guidepost**	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	NA	NA	NA
	Justification			
c	**Guidepost**	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence 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 specified timeframe.	
	Met?	NA	NA	

MSC FISHERY ASSESSMENT REPORT

PI 1.1.3		**Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe**
	Justification	
References		[List any references here]
OVERALL PERFORMANCE INDICATOR SCORE:		**N/A**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y
	Justification	The current long term management plan was agreed by the EU Norway in 2008. The plan has been used as the basis for the provision of advice by ICES and setting an annual TAC, via the annual EU / Norway negotiations since then. The plan has remained unchanged, and is clearly achieving its objectives as evidenced by the current levels of SSB and F. The management plan is clearly designed to be responsive to the current status of the stock and to maintain fishing mortality and SSB at levels which constrain harvesting within safe biological limits and support the maximum sustainable yield in the long term. The plan has worked well in maintaining a stable fishery and maintaining SSB well above the biomass limit point and above the trigger level during a period of sustained poor recruitment. The design of the management plan, based on controlling fishing mortality separately on juveniles and adults, ensures that there is a low probability that SSB will fall below the biomass limit level. The current levels of fishing mortality on both juveniles and adults are below the management plan levels.		
b	**Guidepost**	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	Y

MSC FISHERY ASSESSMENT REPORT

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
	Justification	A management plan, which underpins the harvest strategy, was first in place in 1998 and was revised in 2008. The plan has remained unchanged since 2008 and is clearly achieving its objectives with fishing mortality defined as 'below limit', SSB above the management plan and MSY trigger levels since 2008 and the stock maintains full reproductive capacity. The current harvest strategy is subject to annual evaluation in the context of discussions at the assessment working group (HAWG), by the ICES advisory committee (ACOM) and during the annual EU / Norway negotiations. Following the change in the assessment model in 2012 there was a marked change in the historical perception of SSB. In the light of this change ICES were requested to review the reference points which underpin the harvest strategy. The reference points were re-examined by an ICES Workshop in 2012. After thorough investigation the only change recommended was a lowering of the biomass precautionary reference point, Bpa, from 1.3 million tonnes to 1 million tonnes. The biomass limit reference point remains unchanged at 800,000 tonnes. The levels of SSB and F, since the management plan was reviewed and revised in 2008 clearly show that the strategy is achieving its objectives in terms of maintaining both maximum sustainable yields and full reproductive capacity. This has been achieved during a period of sustained poor recruitment which appears likely to continue.		
c	**Guidepost**	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	There is a comprehensive stock monitoring and assessment programme in place leading to an annual evaluation of the success of the harvest strategy. This is based on accurate catch statistics and an appropriate level of biological sampling of catches and landings. There have been major problems of unaccounted mortality in the past. These were related to misreporting and under reporting of landings, area misreporting, discarding, high grading and slippage. Most of these problems have now been addressed through regulations and more rigorous monitoring and surveillance. High grading and slippage has been banned in EU waters since 2009 and there is a total discards ban within the Norwegian EEZ. The assessment working group accepts that there may still be some unaccounted mortality but consider that the quantities involved are very low and do not affect the annual assessment of the stock on which the harvest strategy is based.		
d	**Guidepost**			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y

MSC FISHERY ASSESSMENT REPORT

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
	Justification	The original management plan was in place in 1998 and reviewed and revised in 2008. The harvest strategy is underpinned by this long term management plan which is firmly based on well-established precautionary reference points. The EU / Norway requested a review of the plan in 2011.Following the change to the assessment model in 2012 the ICES benchmarking workshop noted that reference points could have changed under the changed perception of the stock assessment. As a result an ICES workshop (WKHERMP) carried out a review of the reference points and a re-evaluation of the management plan in 2012. The workshop concluded that the plan appears to operate well in relation to the objectives of consistency and a precautionary approach but not in relation to maintaining a stable high yield. They considered the main weakness in the plan to be the constraint on annual variation of the TAC to 15%. This has led to restrictive TACs when the stock has been improving. No changes have been made to the management plan following this workshop but the biomass precautionary level reference point, Bpa, was reduced from 1.3 million tonnes to 1 million tonnes. EU / Norway has asked ICES to give further consideration to a range of other variables and options; this is due to take place before 2014.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		ICES, 2008, 2011a, 2011c, 2011d, 2012b, 2012d, 2012e, 2013b.		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generally understood harvest 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.	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.	
	Met?	Y	Y	
	Justification	The current strategy is to set an annual TAC, based on managing the stock in accordance with the agreed management plan. The annual TAC is firmly based on the predicted catch corresponding to the ICES advice for adult and juvenile mortality. This is firmly based on managing the stock according to the agreed fishing mortality reference points and the stock status in relation to the management plan upper biomass trigger level and the biomass limit level. The strategy is supported by a raft of technical and conservation measures applied to both the adult fishery and fisheries which take juvenile herring. These include minimum landing size, discarding and slippage bans, a restricted facility to move TAC from one area to another, some seasonal area closures and a restriction on the by-catch levels of herring in all other fisheries. These well-defined rules have been well tried and tested in the past and have been seen to be effective in recovering the stock from low levels historically. In recent years the rules have helped maintain the stock at levels above the Management plan trigger and fishing mortalities below precautionary and management plan levels for both adults and juveniles. The harvest strategy has clear rules which effectively reduce the annual TAC by reducing the fishing mortality, on adults and juveniles, if the SSB falls below the management plan upper biomass trigger level of 1.5 million tonnes. The reduction in fishing mortality is linearly linked to the estimate of SSB and is designed to recover the stock to above the management plan trigger level. If the SSB falls below the biomass limit point then fishing mortality on adults and juveniles is reduced to near zero. The revised biomass precautionary approach reference point of I.0 million tonnes is based on a less than 5% risk of SSB falling below Blim.		
b	**Guidepost**		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		Y	N

PI 1.2.2		**There are well defined and effective harvest control rules in place**		
	Justification	The main uncertainty affecting the harvest control rule is the reliability of the annual stock assessment in estimating current SSB and fishing mortality. These estimates underpin all the advice provided by the ICES advisory committee on managing the stock. That stock assessment is heavily dependent on the reliability of the input data. In that context the major uncertainty is the reliability of the landings data in relation to the actual catch taken at sea. The major uncertainty in the fishery in the past has been the regular overshooting of the TAC related to area misreporting and underreporting of landings, discarding, high grading and slippage. As recently as 2008 the ICES working group's estimate of landings exceeded the official estimate by 16% and exceeded the TAC by 17%. Through better enforcement and monitoring the problem has been dramatically reduced since 2008 to the point where the assessment working group now consider it to be a minor issue relative to current stock status and total catch levels. The assessment working group accepts that there may still be some unaccounted mortality through, for example through shipboard operations, but this uncertainty is not considered to affect the reliability of the assessment of stock status. The assessment working group keep all these issues under regular review and where verifiable information is available from observer trips and reference fleets then the data is included in the assessment. Biological sampling of the landings by all countries covered 80% of the landings in 2012 which was a reduction of 4% compared to the previous year. This level of sampling coverage by area and gear type was considered adequate by ICES in support of the stock assessment and harvest control rules which are based on it. There are also areas of uncertainty in relation to the mix of North Sea autumn spawners and western Baltic spring spawners in the North Sea and in the Skagerrak and Kattegat and the precision of the methods for differentiating between them. There are serious concerns about the effect that catches of Western Baltic spring spawning herring in the targeted autumn spawning fishery has on the state of that stock. The western Baltic spring spawning stock is currently in a poor state. There is no guiding management plan, fishing mortality is well above Fmsy, and the biomass is below the MSY trigger level. Furthermore the stock is in an extended period of low productivity with recruitment below the long term mean for the past eight years. These concerns have been partially addressed in the harvest control rules by permitting part of the TAC for Division IIIa to be taken in the North Sea in an attempt to protect the more vulnerable Western Baltic spring spawners. However variable quantities of Western Baltic spring spawners are also taken in the transfer area in the north eastern North Sea and the fishery there has an unknown impact on the Western Baltic spring spawning stock. This topic is subject to frequent scientific and administrative review, e.g. EU / Norway working group meeting of managers and scientists June 2013, who has been asked to develop and recommend alternative methods to set a TAC for herring in ICES division IIIa.		
c	**Guidepost**	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and 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.

MSC FISHERY ASSESSMENT REPORT

PI 1.2.2		There are well defined and effective harvest control rules in place		
	Met?	Y	Y	N
	Justification	Monitoring of the catches and landings has been working effectively in this fishery for many years. This has been achieved not only via the official records but also by the vigilance and local knowledge of the working group members. In that way the assessment working group has been able to use their own estimates of actual catches. In recent years the problem of slippage, discarding and underreporting of landings is no longer considered to be a problem in relation to the annual stock assessment and subsequent advice. Since 2009 the working group's estimate of landings has been very close to the official landings. Accurate landings data are vital in the stock assessment process on which the annual ICES advice on the TAC is based. In spite of the areas of uncertainty the annual assessment of stock status is considered to be robust and is now presented with 95% confidence intervals to take account of uncertainty. There is strong evidence that the resultant TACs over recent years, coupled with the technical measures, have been effective tools in achieving the levels of exploitation required under the harvest control rule (management plan). The evidence is based on the current status of the stock in relation to both fishing mortality and SSB targets within the management plan. However whilst the tools in use are very effective in controlling the exploitation rate on the North Sea autumn spawning stock there is no clear evidence that they achieve an effective exploitation rate on the vulnerable Western Baltic spring spawning component. There is some uncertainty regarding the actual quantities of spring spawners taken in this fishery in the Skagerrak, Kattegat and north eastern North Sea. The problem is further complicated by the variable transfer of TAC from ICES Division IIIa into a transfer area in the north eastern North Sea.		
References		ICES, 2005, 2008, 2011c, 2012a, 2012d, 2012e, 2013a.		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range 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 related to the current harvest strategy, is available.
	Met?	Y	Y	Y
	Justification	The basic biology and stock structure and dynamics of the North Sea autumn spawning herring has been the subject of considerable research for well over one hundred years. As a result the seasonal distribution, spawning areas and geographic range is very well known and described in the scientific literature. The stock clearly consists of three separate spawning components although there is no genetic basis for separating them. Because the components mix at certain times of the year and cannot be separated in the catches they are treated as one stock for management purposes. The only exception to that is the component which spawns in the southern North Sea and eastern English Channel (Downs component) which has a ring fenced quota to protect it from over exploitation. The raft of fundamental knowledge on the North Sea herring is used in support of the harvest strategy through, for example, minimum landing size, some closed areas at spawning times and restrictions on the catches of juvenile herring. The research has also led to refined methods of separating North Sea autumn spawners from various spring spawning components which occur in the North Sea. This is particularly important in separating the autumn spawners from the Western Baltic spring spawners (identified by post hoc biological sampling) when they occur together both in the Skagerrak and in the north eastern North Sea. Information on maturity and growth rates and sex ratio is routinely collected as part of the sampling process for landings and also as a part of the fishery independent acoustic surveys. The stock/recruitment relationship is well described over a period dating back to 1947 and forms an integral part of the harvest control rule as the basis for the biomass limit level. There are no recent studies on fecundity but extensive studies in the past established the relationship between fish weight and fecundity. Fecundity data are not a part of the current stock assessment process. Natural mortality in the stock is now estimated annually through the North Sea multi species assessment model .Maturity data are updated annually based on sampling on the acoustic surveys. The data in 2012 showed that maturity levels were very high with 91% and 99% of the 2 and 3 ringer fish respectively, mature. Vessel types, vessel size and gear types are well known and described for this fishery and updated annually by members of the ICES assessment working group who have intimate knowledge of their own national fleets.		

MSC FISHERY ASSESSMENT REPORT

PI 1.2.3		Relevant information is collected to support the harvest strategy		
b	Guidepost	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.	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.	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 inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N

MSC FISHERY ASSESSMENT REPORT

PI 1.2.3		**Relevant information is collected to support the harvest strategy**		
	Justification	The total landings data are adequately monitored and most uncertainty related to their validity is removed through national monitoring and surveillance programmes. These include observers at sea, enforcement inspections at sea and some monitoring on reference fleet vessels. In these ways earlier concerns of the assessment working group regarding discarding at sea, slippage and underreporting have been satisfactorily addressed. Whilst they accept that there is still likely to be an element of unrecorded mortality the assessment working group are satisfied that the quantities involved are unimportant in terms of the reliability of the stock assessment. Basic biological data on the landings from North Sea and Skagerrak herring fisheries is routinely collected by all countries participating in the fishery. This is now a statutory requirement of all member states through EU sampling directives issued in 2008 (Comm. Regs. 2008/949EC, 2008/199, 2008/665), or complementary Norwegian regulations. Under these regulations all fleets must comply with minimum sampling levels for numbers of fish measured and aged. The biological sampling programme covered 80% of the landings in 2012 and provides strong support for the age based analytical stock assessment process. The annual stock assessment which underpins the harvest control rule is further supported by a number of fishery independent surveys which provide indices of the abundance of various year classes in the stock There are two main surveys providing independent estimates of the abundance of age groups 0-6 winter ringers in the stock. An acoustic survey in the summer was started in 1979 and extended to cover the Skagerrak and Kattegat in 1989. An international bottom trawl survey in the first quarter of the year was started in 1996 and provides indices of 1 ringers and 2-5 ringers from the trawl hauls and an index of ‘o’ group fish from fine meshed net hauls carried out at night. In addition there is a series of larvae surveys covering the spawning areas of all three spawning components which provide a larval abundance index used to estimate potential recruitment. Thus all the relevant information required for carrying out an annual stock assessment, which provides the basic information on the status of the stock on which the harvest control rules are based is, appropriately monitored. Monitoring of landings in support of the TAC control is carried out contemporaneously with the fishery and enforcement action can be introduced quickly. Whilst there are some residual uncertainties in the data sources which are not serious enough to affect the robustness of the North Sea stock assessment, the potential effects of this fishery on the Western Baltic spring spawning herring stock means that the assessment falls short of the robustness and high degree of certainty required for SG 100.		
c	**Guidepost**		There is good information on all other fishery removals from the stock.	
	Met?		Y	

MSC FISHERY ASSESSMENT REPORT

PI 1.2.3		**Relevant information is collected to support the harvest strategy**
	Justification	The by-catches of herring from other fisheries are landed and adequately monitored where quota is available ('B' fleet quota) and post hoc sampling ensures adequate recognition of removals from the Western Baltic stock.
References		Burd and Howlett, 1974; Harden Jones, 1968; ICES, 2012a, 2013a; Nichols, 2001; Payne et al, 2009; Simmonds, 2009.
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 1.2.4

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**		The assessment is appropriate for the stock and for the harvest control rule.	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.
	Met?		Y	Y

PI 1.2.4		There is an adequate assessment of the stock status
	Justification	From 1972 to 1995 the assessment of the North Sea autumn spawning herring stock was done by means of a virtual population analysis (VPA) model with ad hoc tuning to a series of larvae production estimates, acoustic surveys and trawl surveys. During the early1990s there was increasing uncertainty about the assessment which led to the exploration of other assessment models. The uncertainty was generated by serious differences in the perception of stock size between the various survey indices. In 1995 the assessment working group decided to change to an integrated catch analysis (ICA) method for the assessment of the stock in 1994. The ICA model was used for the North Sea herring assessment each year since 1995. Subsequently this model became widely used for most of the pelagic stocks assessed by ICES. In spite of some computational difficulties it was generally accepted as an appropriate procedure for the assessment of pelagic stocks, indeed the assessment of the North Sea autumn spawning herring stock has been recognised inside ICES as one of the best and most consistent assessments. In 2011 it became apparent that there were unresolved issues with the ICA model and it could no longer be supported within the ICES assessment framework. It was accepted that it would have to be replaced prior to the planned benchmark assessment for herring in 2012. In February 2012 ICES convened a Benchmark Workshop on Pelagic stocks, WKPELA,(ICES, 2012a). Its remit was to determine and review the appropriate stock assessment methods for five pelagic stocks which included North Sea herring. After a thorough investigation and exploration of potential models the Workshop recommended a change to the state – space assessment model (SAM) as an ideal framework to replace the ICA model. This has also resulted in changes to the input data including a return to using the whole time series of landing information dating back to 1947. The listed the main features of the SAM model of importance are: • SAM is a fully statistical model. All data are treated as observations and missing data are handled gracefully. • SAM offers a fully statistical framework that can be used as the basis for model refinement and decision-making. • Uncertainties are generated for all estimated parameters. • SAM internally estimates the precision of each data source and uses this estimate to weight them appropriately in the optimized model. • SAM is a framework rather than a model– it is highly flexible with a low number parameters and can readily be modified to the peculiarities of the given stock. • SAM is open source and cross platform software. As a result, customisations of the source-code to deal with issues are feasible The ICES Herring Assessment Working Group meeting in March 2012 accepted the recommendations of the benchmark workshop on pelagic stocks for the benchmark assessment of North Sea herring in 2012. As a result the tool used for the assessment was the FLSAM, an implementation of the State-space assessment model (www.stockassessment.org), embedded inside the FLR library (Kell et. al 2007). A major improvement of note was the integration of fundamental links between the North Sea ecosystem and the stock dynamics of the autumn spawning herring The assessment now includes variable estimates of natural mortality (M) at age derived directly from a multispecies stock assessment model, the SMS model, used in WGSAM (ICES, 2011b; Lewy and Vinther 2004)

MSC FISHERY ASSESSMENT REPORT

PI 1.2.4		**There is an adequate assessment of the stock status**		
b	**Guidepost**	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	An annual assessment of stock status is carried out by the ICES assessment working group HAWG. The results of the assessment of stock status are reviewed by the ICES advisory committee. The ICES advisory committee (ACOM) provides their annual advice on the basis of the stock status in relation to SSB and F reference points.		
c	**Guidepost**	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	Y
	Justification	The main uncertainties in relation to the assessment are addressed under 1.2.2 and 1.2.3. They are the potential for unaccounted mortality, consistency and reliability of the survey data, recruitment predictions, and changes in catchabilty at age. These sources of uncertainty are clearly identified by the assessment working group and their potential effect, on the estimation of stock status, evaluated annually. The new assessment model now clearly identifies uncertainties in the data and these are generated within the model for all estimated parameters. The model also estimates the precision of each data source and uses this estimate to weight them appropriately in the optimized model. This assessment benefits from a range of fishery independent surveys which include acoustic surveys, a bottom trawl survey, a fine meshed ring net survey and larvae surveys. Analysis of these survey data provides indices of the abundance of various age groups. All the potential sources of uncertainty together with the survey indices are carefully considered during the exploratory phases of the annual assessment and taken into account before a final assessment is produced. The important parameters, in relation to the evaluation of stock status relative to reference points are the estimates of spawning stock biomass and fishing mortality. A major feature of the outputs from the assessment new modelling procedure is that these output parameters are now expressed in terms of an estimated value with the 95% confidence intervals of that estimate included. The model also provides 95% confidence intervals on the estimates of recruitment and total stock biomass.		
d	**Guidepost**			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y

MSC FISHERY ASSESSMENT REPORT

PI 1.2.4		**There is an adequate assessment of the stock status**		
	Justification	The explanation of the process of model; exploration and change dating back to 1972 is comprehensively covered under a) above. The process has culminated in a radical change to a completely different modelling procedure for this stock. Before this change was made various alternatives were rigorously explored by a group of experts convened by ICES to examine the assessment of pelagic stocks. The group also rigorously explored the input data to the assessment and made recommendations in that respect to a subsequent benchmark assessment workshop. These recommendations were further explored at the benchmark workshop and where considered appropriate were accepted and used in the 2012 and 2013 assessments. It is an established and routine element of ICES assessment working group procedures that all the assessment input data are carefully checked and examined for potential problems before being accepted into the assessment process. After validation numerous runs of the assessment model are made. These separate runs explore potential data defects and their impact on the assessment. This is a well-established rigorous process of all ICES stock assessment working groups with the ultimate aim of providing managers with the most dependable estimate of the status of a stock. As a part of this annual process it is routine to explore other assessment models, where time permits, and compare the results with the established modelling procedure. Because of the major change to the new model in 2012, and the rigorous exploration of potential alternatives leading up to that change, no exploratory assessment runs were made at the 2013 assessment working group.		
e	**Guidepost**		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y
	Justification	The assessment is subject to peer review within EU / Norway agreement, by the HAWG and the ICES advisory committee, ACOM. Any one of these bodies can comment on the assessment and request either further explanation or ask for changes to be explored. The assessment of the stock is also subject to rigorous annual review at a number of levels. The EU / Norway annual meeting reviews the results of the assessment independently of ICES, as does the EU advisory committee on fisheries and aquaculture, even though some of the scientists involved in both these groups also participate in the HAWG meetings. Within ICES, the stock assessments are subject to internal peer review by the ICES advisory committee ACOM before advice is provided to the EU / Norway management body. ICES also commissions occasional periodic reviews of specific stock assessments and its overall assessment methodology. This is strongly evidenced in relation to the current assessment and the major changes recommended to the modelling procedure. Assessments methods and management procedures and advice are also subject to frequent scrutiny by a range of third parties from the fishing industry itself to a variety of environmental NGOs		
References		ICES, 1996, 2005, 2011a, 2011b, 2012a, 2012b, 2012c, 2013a, 2013b: Lewy and Vinther, 2004; Patterson, 1998; Payne, 2010; Simmonds, 2009.		
OVERALL PERFORMANCE INDICATOR SCORE:				

MSC FISHERY ASSESSMENT REPORT

PI 1.2.4	There is an adequate assessment of the stock status	
CONDITION NUMBER (if relevant):		100

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.1.1 - PURSE SEINE

PI 2.1.1		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		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	N
	Justification	With the exception of Western Baltic spring spawning herring (WBSSH), all retained species are caught in nugatory quantities (<<100 t/year) and do not meet the MSC threshold criterion for being termed main retained species; i.e. >5% the total catch of all species. Although WBSSH catches are much larger (882 t) they are still very small (<1.5%) of the total Norwegian catch of North Sea and Skagerrak herring and do not qualify as main retained species. The retained species recorded from the North Sea and Skagerrak herring (NS&SH) fishery 2010–12 are: WBSSH (882 t); mackerel (40 t purse seine) Norway pout (38 t), horse mackerel (22 t), North Sea saithe (16 t), blue whiting (5 t), sprat (3 t), whiting (3 t), North Sea haddock (2 t), silvery pout (1 t), northern hake and North Sea cod (<1 t). There is a high degree of certainty that each of the species that is caught in measurable quantities (i.e. > 1 t per year) is within or fluctuating around biologically based limits **Mackerel**: SSB = 2.68 Mt; F 0.36 (F exceeds F_{MSY} due to breakdown in management agreement but SSB still above reference levels) **Norway pout**: SSB = 205 kt; F 0.70 **Horse mackerel**: SSB = 1.66Mt; F 0.17 **Saithe**: SSB = 302 kt; F 0.31 For the other retained species: **Blue whiting**: SSB 5.13 Mt; F 0.13 **Sprat:** stock managed on basis of in-year assessment for which data are of immediate relevance. **Whiting**: North Sea whiting is relatively stable and F has been declining steadily for several years. **Northern hake:** SSB 145 kt; F 0.42. Although fishing mortality rate has been higher than desired, the stock has shown a positive trend to levels far in excess of previously recorded in the past 30 years. **North sea haddock**: SSB = 255 kt; F 0.20 **North Sea cod**: SSB = 78 kt; F 0.47 is no better than B_{lim} . Nevertheless, F has fallen below F_{pa} but remains above F_{MSY} and ICES considers that it is being harvested sustainably. As less than 1 t/year North Sea cod is taken in the NS&SH fishery its status is no immediate significance in this context. Similarly for silvery pout, for which there are no assessment data. **WBSSH**: SSB=87 936 t ; F 0.33; F has shown a steady decline over the past 5-6 years, but is still higher than FMSY; stock has been relatively stable over the same period at or about Blim. Currently there is no internationally agreed management plan or harvest control rule. Nevertheless, the ICES approach to annual assessment of this stock and its provision of advice to fishery management bodies has been basing its advice on precautionary principles. Furthermore, even in the absence of a formally agreed management plan, the ICES precautionary advice has been adopted as the basis for the EU–Norway management of this fish stock.		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.1		**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**		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			Y
	Justification	Target reference points are defined for; **Mackerel**: $SSB_{trigger}$ 2.20 Mt; F_{target} 0.20–0.22; MSY $B_{trigger}$ 2.2 Mt; F_{MSY} 0.22; B_{lim} 1.67 Mt; B_{pa} 2.30 Mt; F_{lim} 0.42; F_{pa} 0.23. **Horse mackerel**: F_{MSY} 0.13. **Saithe**: SSB_{MP} 200 kt; F_{MP} 0.30; MSY $B_{trigger}$ 200 kt; F_{MSY} 0.30; B_{lim} 106 kt; B_{pa} 200 kt; F_{lim} 0.60; F_{pa} 0.40. **Blue whiting**: $SSB_{trigger}$ 2.25 Mt; F_{target} 0.18; MSY $B_{trigger}$ 2.25 Mt; F_{MSY} 0.18; B_{lim} 1.50 Mt; B_{pa} 2.25 Mt. **Whiting:** F_{MP} 0.30. **NS haddock**: SSB_{MP} 100 kt; F_{MP} 0.30; MSY $B_{trigger}$ 140 kt; F_{MSY} 0.30; B_{lim} 100 kt; B_{pa} 140 kt; Fl_{im} 1.00; F_{pa} 0.70. **Northern hake:** F_{MSY} 0.24; **NS cod**: SSB_{MP} 150 kt; F_{MP} 0.40; MSY $B_{trigger}$ 150 kt; F_{MSY} 0.19; B_{lim} 70 kt; B_{pa} 150 kt; F_{lim} 0.86; F_{pa} 0.65. **Sprat and Norway pout:** Short-lived species; in-year 'real-time assessment advice. **WBSSH**: MSY $B_{trigger}$ = 110 kt; F_{MSY} 0.28; B_{lim} 90 kt; B_{pa} 110 kt.		
c	**Guidepost**	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	NA	NA	
	Justification	Not applicable: none of the retained species meet the threshold to qualify as main retained species.		

PI 2.1.1		**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**		
d	**Guidepost**	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.		
	Met?	Y		
	Justification	The measures in place are to retain, record and report all non-target commercial species, count them against their respective quota and contribute the data to the appropriate stock assessment. This is done for all retained species, including the WBSSH, which are identified and allocated to stock post hoc. These measures are appropriate to ensure that the fishery is not causing the retained species to be outside biologically based limits or hindering recovery. The measures in place for the WBSSH has reduced fishing mortality rate in recent years and stabilised stock with the most recent estimate of SSB being above B_{lim} at c. MSY $B_{trigger}$.		
References		$ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf $ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf $ACOM_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf $ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf $ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf $WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf $ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.1	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
	Advice Book 9.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf $ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf $ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf $ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf $ACOM_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5. http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.1.2 - PURSE SEINE

PI 2.1.2		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are 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 a partial strategy 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 a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There are numerous stock management plans, rules and tools (TAC, quotas, minimum mesh & fish sizes, mesh and grid regulations, real-time closures) in place that are expected to maintain the retained species at levels that are highly likely to be within biologically based limits; the quantities caught in the NS&SH fishery will ensure the fishery does not hinder any stock recovery or rebuilding, including WBSSH. The operational strategy is to minimise the capture of non-target species at all times while the administrative strategy is to collect accurate and verifiable data in support of the appropriate stock assessment and to ensure that each stock is managed in accordance with its national and, or internationally agreed management plan. With respect to the WBSSH, they migrate into parts of Division IIIa and eastern Division IVa where they mix with North Sea autumn spawners. They cannot be separated in the catches and post hoc estimation of the proportions of each stock component in the catches is made by biological sampling. There are currently no specific management objectives for the stock and there is no agreed management plan in place but ICES advice on the management of the WBSS herring stock is on the basis of a transition to MSY fishing mortality targets. This system has worked well with the agreed TAC in line with the advice. Estimates of the total catch of WBSSH have not exceeded the agreed TAC since 2010. Firm control on the exploitation of the WBSS component has been achieved in part by a management measure, introduced in 2011, that allows the transfer up to 50% of Div IIIa quotas to a transfer area in Division IVa east. Monitoring shows that about 40% of the Div IIIa TAC was taken in the North Sea transfer area in 2011 and 2012. On the assumption that this strategy is maintained, and ICES advice followed it is anticipated that SSB will continue to grow above MSY $B_{trigger}$ over the next two years.		

PI 2.1.2		**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**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	The strategy is tested through the annual ICES stock assessments. With the exception of WBSSH, of the retained species for which average catch is >1 t per year, the annual ICES stock assessments show healthy stocks and, or appropriate levels of F. This is clear evidence that the strategy is being implemented successfully. ICES has found that North Sea whiting is relatively stable and F has been declining steadily for several years, while northern hake SSB has been increasing and F decreasing. Even North Sea cod is showing weak signs of recovery in response to the management plan and ICES considers that it is being harvested sustainably. Even in the absence of a formally agreed management plan for the WBSSH, the current strategy is beginning to show signs of working in that there has been a steady decline in fishing mortality in recent years and there are nascent signs of stock recovery. Although there is some objective basis for confidence that the partial strategy will work, the WBSSH assessment cannot be viewed with high confidence as it is dependent on a range of stock distribution assumptions and post hoc biological sampling to estimate annual catch levels.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	With the possible exception of WBSSH, annual ICES stock assessments showing sustained healthy state of retained species' stocks and, or appropriate levels of F provide clear evidence that the strategy is being implemented successfully. ICES has found that North Sea whiting is relatively stable and F has been declining steadily for several years, while northern hake SSB has been increasing and F decreasing. Even North Sea cod is showing weak signs of recovery and ICES considers that it is being harvested sustainably. As with whiting and North Sea cod, there is some evidence that the strategy adopted to manage the WBSSH fishery and optimise stock recovery is showing signs of working; i.e. it is being implemented successfully. Nevertheless, it will require firm evidence that the stock has recovered to levels >MSY Btrigger before it is deemed to show clear evidence, and even then there may be doubts based on post hoc estimation of catch allocations.		

PI 2.1.2		**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**		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	With the possible exception of WBSSH, annual ICES stock assessments showing sustained healthy state of retained species' stocks and, or appropriate levels of F provide clear evidence that the strategy is being implemented successfully. ICES has found that North Sea whiting is relatively stable and F has been declining steadily for several years, while northern hake SSB has been increasing and F decreasing. Even North Sea cod is showing weak signs of recovery and ICES considers that it is being harvested sustainably. As with whiting, hake and North Sea cod, there is some evidence that the strategy adopted for WBSSH is achieving its overall objective; there has been a sustained reduction in fishing mortality rate in recent years, SSB has stabilized and is showing early, albeit weak, signs of increase.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
	Justification	Sharks do not contribute to the retained catch in this fishery.		
References		$ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf $ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf $ACOM_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.2	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
	/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf $ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf $ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf $WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf $ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES Advice Book 9.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf $ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf $ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf $ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf $ACOM_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5. http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.1.3 - PURSE SEINE

PI 2.1.3		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	All commercial fish species must be retained, recorded and landed. All records are subject to scrutiny at sea and on landing. This is complemented by an observer programme and more detailed data from a reference fleet. There is a comprehensive biological sampling programme, which informs accurate and verifiable analytical assessments of the consequences for the status of all bar WBSSH among retained species. The catches of WBSSH are all estimated and allocated on the basis on post hoc biological sampling and analysis rather than straightforward species identification and recording at the time of capture. While such data meet the SG80 criteria they fall short of the SG100 standard of 'accurate and verifiable'.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The quantity of data gathered is undoubtedly of suitable quality to make reliable quantitative assessments of the principal retained species. Nevertheless, the catches of each of the retained species are so trivial that there is a high degree of certainty that this fishery is having no measureable or adverse effect on any of the corresponding stocks. The post hoc biological sampling and analysis upon which estimates of WBSSH catches are based is sufficient to estimate outcome status with respect to biologically based limits but not with a high degree of confidence.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.1.3		**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**		
	Justification	With the possible exception of WBSSH, the quantities of data gathered on retained species are of sufficient quality to support their respective stock assessments and management strategies with a high degree of certainty that the respective strategies are achieving their objectives. In particular, the catches taken for each of the retained species are so trivial that there is a high degree of certainty that this fishery is having no measureable or adverse effect on any of the corresponding stocks. The total herring catch data and the post hoc biological sampling and analysis that provides the estimate of WBSSH catches in the NS&SH fishery are adequate to support a strategy to manage retained species, and evaluate whether the strategy is achieving its objective but it is too early to say with a high degree of certainty that the strategy is meeting its objectives.		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y
	Justification	All commercial fish species must be retained, recorded and landed. All records are subject to scrutiny at sea and on landing. WBSSH are monitored post hoc to a level consistent with a quantitative assessment for management of the fishery. The landing monitoring programme is complemented by an observer programme and more detailed data from a reference fleet. There is a comprehensive biological sampling programme, not least on WBSSH, which informs analytical assessments of the consequences for the status of retained species. These data and assessments are in sufficient detail to assess ongoing mortalities to all retained species. In particular, the quantities taken for each of the retained species, except WBSSH, are so trivial relative to targeted fisheries for retained species stocks that there is a high degree of certainty that this fishery is having no measureable or adverse effect on any of the corresponding stocks.		
References		ACOM$_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf ACOM$_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf ACOM$_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the		

PI 2.1.3	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
	Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf $ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf $ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf $WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf $ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES Advice Book 9.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf $ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf $ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf $ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf $ACOM_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5. http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.2.1 - PURSE SEINE

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	Y
	Justification	All non-target species are caught in minute quantities relative to the target species. Where non-target commercial species are caught in measurable quantities, they are recorded as part of the catch (see P2.1, retained species above). Reference-fleet records support the industry contention that the occurrence of any non-target bycatch is extremely rare; indeed, in the purse-seine fisheries (all target fisheries combined) only garfish, saury pike, saury pike and gurnards are recorded. In each case, these records represent <0.5% of the total number of fish recorded in the reference-fleet data set.		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	For purely commercial reasons, skippers wish to minimise the capture of non-target species at all times. Data collected from the observer fleet illustrate that the operational measures adopted are successful in meeting the skippers' objective. The quantity of bycatch taken in the NS&SH fishery is not sufficient to place the species or stock at risk of being outside safe biological limits.		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		

MSC FISHERY ASSESSMENT REPORT

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**
	Justification	For purely commercial reasons, skippers wish to minimise the capture of non-target species at all times. Data collected from the observer fleet illustrate that the operational measures adopted are successful in meeting the skippers' objective. The quantity of bycatch taken in the NS&SH fishery is not sufficient to place the species; stock at risk of being outside same biological limits.
References		IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.2.2 - PURSE SEINE

PI 2.2.2		**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**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch 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 a partial strategy in place, if necessary, that is expected to maintain the main bycatch 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 a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	For purely commercial reasons, skippers wish to minimise the capture of non-target species at all times. Data collected from the observer fleet illustrate that the operational measures adopted are successful in meeting the skippers' objective.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	Data collected from the reference fleet, and verified during the consultation with IMR and the DoF, indicate that the strategy works successfully and that bycatch is virtually non-existent.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y

MSC FISHERY ASSESSMENT REPORT

PI 2.2.2		**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**		
	Justification	Data collected from the reference fleet, and verified during the consultation with IMR and the DoF, indicate that the strategy works successfully and that bycatch is virtually non-existent.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	Data collected from the reference fleet, and verified during the consultation with IMR and the DoF, indicate that the strategy works successfully and that bycatch is virtually non-existent. Consequently, it is certain that the fishery does not pose a serious risk or cause irreversible harm to bycatch populations.		
References		IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.2.3 - PURSE SEINE

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	The reference-fleet observer programme gathers quantitative information that provides an index of the aggregated total bycatch across all pelagic fisheries, not just the NS&SH fishery. Nevertheless, these data are sufficient to corroborate the industry's contention that the capture of non-target species (retained and bycatch) is very rare. Consequently, there is a clear implication that the consequences of such bycatch for the respective stock status is ≥zero.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	The reference-fleet observer programme gathers quantitative information that provides an index of total bycatch only. Nevertheless, the trivial numbers of bycatch species caught provide a high degree of certainty that the fishery is not having an adverse effect with respect to biological limits.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage ~~retained~~ bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	The reference-fleet observer programme gathers quantitative information that provides an index of total bycatch only. Nevertheless, these data are sufficient to demonstrate with a high degree of certainty that the strategy to minimise bycatch is achieving its objectives.		

MSC FISHERY ASSESSMENT REPORT

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
d	**Guidepost**		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 effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	Y
	Justification	The reference-fleet observer programme provides sufficient detail to assess whether or not there is any significant change in catch composition of characteristics that might possibly have meaningful implications for the status of bycatch species.		
References		IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.3.1 - PURSE SEINE

PI 2.3.1		The fishery meets national and international requirements for the 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of 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.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	Y
	Justification	Reference-fleet observers gather data on ETP interactions. Although the demersal fisheries reference-fleet data provide evidence of fishery interactions with seabirds and mammals, no such instances were seen in the purse-seine fisheries. The absence of such evidence to the contrary supports the industry's contention that although there may be the occasional capture of birds diving to take fish during hauling, it is neither a regular nor frequent occurrence. The same conclusion must be drawn for purse seines, added to which they have the ability to release mammals unharmed in the event that one is captured. Furthermore, the low numbers of ETP species (principally elasmobranchs) recorded by the reference-fleet observers provide a high degree of certainty that direct interactions between the NS&SH fishery and ETP species do not cause significant detrimental effects. Thus, ≥zero observations provide a high degree of certainty any such interactions provide sufficient detail to assess ongoing mortalities to ETP species and ensure that they comply with Norway's national and international obligations.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	Y
	Justification	The low numbers of ETP species (principally elasmobranchs) recorded by the reference-fleet observers provide a high degree of certainty that direct interactions between the NS&SH fishery and ETP species do not cause significant detrimental effects.		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y

PI 2.3.1		**The fishery meets national and international requirements for the 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**
	Justification	Over the past 70 years the various pelagic (and demersal) stocks in the NE Atlantic have waxed and waned over 2–3 orders of magnitude without evidence of significant detrimental effects on other prey–predator species. Furthermore, IMR ecosystem modelling of Norwegian fisheries, long-term monitoring of marine mammals by IMR, seabirds by NINA and ICES reviews of seabird and marine mammal–fishery interactions have not identified any cause for concern with respect to the NS&SH fishery. Thus, there is a high degree of certainty that there are no detrimental indirect effects of the NS&SH fishery on ETP species.
References		http://www.birdlife.org/seabirds/index.html http://www.nina.no/ninaenglish/Publications.aspx WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt med focus på fiske med garn og line. NINA Rapport 719. http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, Book 1.5.1.3. http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf $IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564 Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, 41. doi:10.1016/S0165-7836(99)00013-2 IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Tjelmeland, S. & Lindstrøm, U. 2005. An ecosystem element added to the assessment of Norwegian spring spawning herring: implementing predation by minke whales ICES Journal of Marine Science, 62 (2005), pp. 285–294. Lindstrøm, U., Smoutb, S., Howell, D. & Bogstad, B. 2009. Modelling multi-species

PI 2.3.1	**The fishery meets national and international requirements for the 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**
	interactions in the Barents Sea ecosystem with special emphasis on minke whales and their interactions with cod, herring and capelin. Proceedings of the ECONORTH Symposium on Ecosystem Dynamics in the Norwegian Sea and Barents Sea. Deep Sea Research 56, 2068–2079.
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.3.2 - PURSE SEINE

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y
	Justification	In addition to the skippers' operational strategy to minimise the capture of any non-target species (fish, birds or mammals), there is the national strategy set out in the Norwegian Marine Resources Act and the regional seas management plans that explicitly requires an ecosystem approach to marine environmental management. The act also requires that all fish species are retained, recorded and landed and that vessels equipped with elogbooks must record interactions with seabirds and marine mammals. Norwegian fishery and conservation agencies monitor the fishery, bird and mammal populations. Where there is deemed to be cause for concern, e.g. relatively high catches of *S. marinus* or spurdogs, specific measures are implemented, e.g. move-on and area closures. There are also permanent and seasonal closures of inshore waters in the vicinity of key seabird nesting sites.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N

MSC FISHERY ASSESSMENT REPORT

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Justification	The low–zero numbers of ETP species recorded by the reference-fleet observers indicate that the operational measures adopted by skippers are effective in minimising interactions with and capture of non-target fish, bird and mammal species. The reference-fleet data, however, provide only an index of what is happening across pelagic fisheries as a whole and do not lend themselves to rigorous analysis. In contrast, the elogbook system has now been rolled out across all the (larger) vessels in the Norwegian fleet and this requires that all fish, bird and mammal captures are recorded. Unfortunately, it is not anticipated that any analysis of these logbook records will be made before 2015.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	Marine mammal and seabird stock monitoring and abundance estimates are made by IMR and NINA, and reviewed by ICES, OSPAR and NAMMCO. The absence of any specific concerns with respect to these populations and the NS&SH fishery is clear evidence that the strategy is being implemented successfully. There are specific fishery management measures, e.g. move-on and area closures, to safeguard red-list fish species such as *S. marinus* and spurdogs. These measures are robustly enforced and implemented successfully.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	All seabird and marine mammal populations are monitored; currently, none are deemed to be specific cause for concern, least of all with respect to the NS&SH fishery. Catch numbers for red-list fish species, such as *S. marinus* and spurdog, are low and not a cause for concern. i.e. the operational strategy to minimise interactions with non-target species is achieving its objective.		
References		http://www.birdlife.org/seabirds/index.html http://www.nina.no/ninaenglish/Publications.aspx WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
	med focus på fiske med garn og line. NINA Rapport 719. http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, Book 1.5.1.3. http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf $IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564 Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, 41. doi:10.1016/S0165-7836(99)00013-2 IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Tjelmeland, S. & Lindstrøm, U. 2005. An ecosystem element added to the assessment of Norwegian spring spawning herring: implementing predation by minke whales ICES Journal of Marine Science, 62 (2005), pp. 285–294. Lindstrøm, U., Smoutb, S., Howell, D. & Bogstad, B. 2009. Modelling multi-species interactions in the Barents Sea ecosystem with special emphasis on minke whales and their interactions with cod, herring and capelin. Proceedings of the ECONORTH Symposium on Ecosystem Dynamics in the Norwegian Sea and Barents Sea. Deep Sea Research 56, 2068–2079.
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.3.3 - PURSE SEINE

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	Data on seabirds and marine mammal populations are gathered and assessed by NINA and IMR respectively. Specifically, the pelagic fisheries are monitored through the reference fleet and data on all (red-list) fish are collected from every commercial fishing vessel. These data show that the fishery interactions with ETP species are ≥zero for which the quantitative estimate of the fishery effect on ETP status is zero.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	All fish, including red-list fish must be retained, recorded and landed. All fishing activity is subject to monitoring and enforcement measures at sea, on land and by air. It is reasonable to conclude, therefore that the information available is accurate and verifiable for the magnitude of all impacts, mortalities and injuries and the consequences for the status of red-list fish species. At present, the data on seabirds and marine mammals is limited to that gathered from the reference fleet and then by extrapolation – a practice that does not necessarily provide accurate results. Once the data from the 'e' logbooks are available for analysis, this should improve.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy 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.
	Met?	Y	Y	N

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	In addition to monitoring the numbers of seabird and marine mammal interactions aboard the reference fleet, the total populations of these groups across Norwegian waters are also monitored by NINA and IMR, respectively, and fishery effects assessed. The same if true for critical red-list fish species such as spurdog and *S. marinus* but stock status of other red-list (elasmobranch) fish is not monitored to the same degree, principally because catch numbers are too low. In the event that their populations, and catches, were greater than is currently the case, the same conservation strategy would presumably be applied in full, e.g catch-level threshold and move-on policy, area closures, stock assessments. The same will only become true for seabirds and marine mammals once the e-logbook recording system is fully operational and producing verifiable information. Thus, overall, information is sufficient to measure trends and support a strategy that is less than comprehensive with respect to birds and mammals even though there is no evidence that the fishery is having a discernible effect on any ETP species or population.
References		http://www.birdlife.org/seabirds/index.html http://www.nina.no/ninaenglish/Publications.aspx WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt med focus på fiske med garn og line. NINA Rapport 719. http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, Book 1.5.1.3. http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf $IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564 Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, 41. doi:10.1016/S0165-7836(99)00013-2 IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of

MSC FISHERY ASSESSMENT REPORT

PI 2.3.3	**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Tjelmeland, S. & Lindstrøm, U. 2005. An ecosystem element added to the assessment of Norwegian spring spawning herring: implementing predation by minke whales ICES Journal of Marine Science, 62 (2005), pp. 285–294. Lindstrøm, U., Smoutb, S., Howell, D. & Bogstad, B. 2009. Modelling multi-species interactions in the Barents Sea ecosystem with special emphasis on minke whales and their interactions with cod, herring and capelin. Proceedings of the ECONORTH Symposium on Ecosystem Dynamics in the Norwegian Sea and Barents Sea. Deep Sea Research 56, 2068–2079.
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.4.1 - PURSE SEINE

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely 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.
	Met?	Y	Y	Partial
	Justification	Pelagic gears avoid seabed contact at all cost and purse seines are only brought into contact with smooth sedimentary seabed where they will have minimal effect. To do anything else risks damage that could incur great cost in repairing the purse seine. Consequently, it is universally accepted that pelagic gears are the least likely of all fishing methods to have any adverse effect on seabed habitat structure or function; therefore there has been no direct research. In the absence of specific research, evidence is inferential rather than substantive, hence the partial score.		
References		www.mareano.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.4.2 - PURSE SEINE

PI 2.4.2		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Norway maintains the MAREANO programme to map sensitive habitats and has established 'no fishing zones' to protect sensitive marine habitats (SMH). These regulations apply to all towed gears, although they are primarily aimed at bottom-contact fisheries. The MAREANO mapping programme is ongoing and there are regional seas management plans that include monitoring sensitive habitats. The annual status reports of each of the regional seas are presented to Parliament. Additionally, the Marine Resources Act requires an ecosystem approach to safeguarding biodiversity in addition to managing exploited resources. All vessels that can fish in proximity to SMHs are fitted with VMS to monitor compliance. Operationally, pelagic-vessel strategy is to avoid bottom contact in such areas at all cost; administratively, the strategy is to monitor the distribution of fishing activity in the vicinity of SMHs and enforce the regulations with rigour.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	Y
	Justification	Economic imperatives ensure that skippers avoid bottom contact with pelagic gear in SMH areas. In addition to monitoring the fishery, seabed habitats continue to be monitored and mapped through the MAREANO programme; while this work continues to identify areas that have been affected by bottom-contact towed gears it has not identified any habitat concerns with respect to pelagic fishing gears.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y

MSC FISHERY ASSESSMENT REPORT

PI 2.4.2		**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**		
	Justification	Commercial self- interest encourages pelagic skippers to avoid seabed contact in any area that might be deemed SMH. There is 'clear evidence' in that the authorities record or prosecute the rare instances of incursions into protected areas but without exception, such prosecutions involve the demersal fishing industry, not the pelagic sector.		
d	**Guidepost**			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	The on-going MAREANO and regional seas monitoring programmes provide some evidence that the strategy is providing overall protection to sensitive habitats and therefore achieving its objectives. But more generally, evidence is derived by inference from the established fishing practice and lack of contact between pelagic gears and seabed habitats.		
References		www.mareano.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.4.3 - PURSE SEINE

PI 2.4.3		**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**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	The MAREANO programme has developed very detailed maps of seabed habitats across many of the principal fishing grounds in Norwegian waters and is ongoing. Critically sensitive habitats are protected from towed gear fishing by closed areas and by a general prohibition on all bottom contact fishing in 'new' areas at depths greater than 1000 meters. This latter restriction does not apply to the pelagic sector as it is recognised that they do not pose a threat to marine habitats.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	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 of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	The effect of pelagic gears on sensitive habitats has not been quantified other than by the general observation that such physical impact would entail a penurious financial penalty for the skipper in terms of damaged fishing gear and lost fishing time. Consequently, it is generally accepted that other than in the most extreme circumstance, the effect of such gears on most sensitive habitats is zero but the effect of purse seines on (level) sedimentary substrata has not been quantified.		
c	**Guidepost**		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).	Changes in habitat distributions over time are measured.
	Met?		Y	N

MSC FISHERY ASSESSMENT REPORT

PI 2.4.3		**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**
	Justification	Habitats continue to be mapped and are monitored through the ongoing MAREANO programme. Although it has now been going for several years, it is still in the process of baseline mapping and has not reached the point where changes in habitat distribution can be measured. Nevertheless, it is recognised that pelagic gear does not pose any risk to habitat abundance or distribution.
References		www.mareano.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**85**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.5.1 - PURSE SEINE

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	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.	There is evidence 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.
	Met?	Y	Y	Partial
	Justification	Norway maintains extensive ecosystem monitoring and management programmes that review the role of fisheries and target species' trophic role A key element of this is the annual assessment, management advice and landing (which have fluctuated by three orders of magnitude in recent decades) for the North Sea & Skagerrak herring fishery. While these variations have been linked to the waxing and waning of other stocks, e.g. NE Arctic cod, there has never been any substantive evidence of irreversible harm. The Marine Resources Act makes it an explicit requirement that an ecosystem approach is taken to all aspects of marine resource management and this provides the statutory framework for the regional seas' management plans. It is highly unlikely therefore that the fishery will disrupt ecosystem structure or function. Nevertheless, such conclusions are drawn by inference rather than substantiated facts, hence the reduced score.		
References		www.imr.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Vinther, M. 2001. Ad hoc multispecies VPA tuning applied for the Baltic and North Sea fish stocks. ICES Journal of Marine Science, 58: 311–320. Lewy, P., & Vinther, M. 2004. A stochastic age–length-structured multispecies model applied to North Sea stocks. ICES CM 2004/FF: 20. 33 pp. Kempf, A., Floeter, J., & Temming, A. 2006. Decadal changes in the North Sea food web between 1981 and 1991—implications for fish stock assessment. Canadian Journal of Fisheries and Aquatic Sciences, 63: 2586–2602. Mackinson, S., and Daskalov, G. 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Science Series Technical Report, Cefas Lowestoft, 142. WGRED, 2008. Report of the Working Group for Regional Ecosystem Description ICES CM 2008/ACOM:47. 203 pp. Dickey-Collas, M., Nash, R.D.M., Brunel, T., van Damme, C.J.D., Marshall, C.T., Payne, M. R., Corten, A., Geffen, A.J., Peck, M.A., Hatfield, E.M.C., Hintzen, N.T., Katja Enberg6, Kell, L.T. & Simmonds, E. J. 2010. Lessons learned from stock collapse and recovery of North Sea herring: a review. ICES Journal of Marine Science, 67: 1875–1886. WGSAM, 2011. Report of the Working Group on Multispecies Assessment Methods. ICES CM 2011/SSGSUE:10. 229 pp. WGECO, 2012. Report of the Working Group on the Ecosystem Effects of Fishing Activities. ICES CM 2012/ACOM:26. 192 pp.		

MSC FISHERY ASSESSMENT REPORT

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
OVERALL PERFORMANCE INDICATOR SCORE:		**95**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.5.2 - PURSE SEINE

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	Y
	Justification	The strategy is to establish a marine environment and sustainable resources to make a full and long-term contribution to the Norwegian economy. The Norwegian Marine Resources Act has an explicit requirement to take an ecosystem approach to resource management and exploitation. The act provides the statutory basis for the suite of regional seas management plans, each aimed at monitoring and safeguarding the status of the marine environment and the resources it supports. It is implicit in the IMR long- term objective for developing a Norwegian ecosystem model that there is a plan to manage Norwegian fisheries, not the least of which is the NS&SH fishery, and maintain the stocks at levels consistent with the Norwegian strategy for rational utilization of all their marine resources. Specifically, the NSSH fishery management is consistent with the MSY approach.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy 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.	The strategy, which consists of a plan, contains 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. 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.
	Met?	Y	Y	Y

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
	Justification	The Norwegian Marine Resources Act has an explicit requirement to take an ecosystem approach to resource management and exploitation. The act provides the statutory basis for the suite of regional seas management plans, each aimed at monitoring and safeguarding the status of the marine environment and the resources it supports. It is implicit in the IMR long term objective of developing a Norwegian ecosystem model that there is a plan to manage Norwegian fisheries, not the least of which is the NS&SH fishery, and maintain the stocks at levels consistent with the Norwegian strategy for rational utilization of all their marine resources. Measures include the MAREANO mapping programme that monitors, inter alia, anthropogenic interactions with the seabed and informs appropriate management decisions, e.g. coral closed areas. There are fishery biological and technical conservation measures for safeguarding stocks and managing fisheries and the interactions with other animals. In addition, IMR and other Norwegian research institutions are actively engaged in developing and refining comprehensive ecosystem–resource models to underpin their environmental and resource management. All management measures are backed up by a vigorous and rigorous enforcement regime. More specifically, the NSSH fishery management is consistent with the MSY approach.		
c	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	Y
	Justification	Prior experience from Norwegian waters (e.g. both the North Sea & Skagerrak herring and cod stock recovery; MAREANO mapping and closed areas; biological and technical measures) and elsewhere in the north Atlantic suggests that the Norwegian government's approach is not only a plausible and acceptable approach to fishery-ecosystem management but is one that is likely to yield a positive long-term contribution to sustainability.		
d	**Guidepost**		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	Y
	Justification	Fishery enforcement is robust and demonstrates its effectiveness through warnings, administrative penalties and court action where appropriate. IMR – ICES stock assessments have shown, and continue to show that the fishery management measures are effective at rebuilding stocks and maintaining them at high levels of productivity. Specifically, the NSSH fishery management is consistent with the MSY approach. The MAREANO programme continues to build a database of Norwegian seabed habitats and anthropogenic effects.		

MSC FISHERY ASSESSMENT REPORT

PI 2.5.2	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function
References	www.imr.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Vinther, M. 2001. Ad hoc multispecies VPA tuning applied for the Baltic and North Sea fish stocks. ICES Journal of Marine Science, 58: 311–320. Lewy, P., & Vinther, M. 2004. A stochastic age–length-structured multispecies model applied to North Sea stocks. ICES CM 2004/FF: 20. 33 pp. Kempf, A., Floeter, J., & Temming, A. 2006. Decadal changes in the North Sea food web between 1981 and 1991—implications for fish stock assessment. Canadian Journal of Fisheries and Aquatic Sciences, 63: 2586–2602. Mackinson, S., and Daskalov, G. 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Science Series Technical Report, Cefas Lowestoft, 142. WGRED, 2008. Report of the Working Group for Regional Ecosystem Description ICES CM 2008/ACOM:47. 203 pp. Dickey-Collas, M., Nash, R.D.M., Brunel, T., van Damme, C.J.D., Marshall, C.T., Payne, M. R., Corten, A., Geffen, A.J., Peck, M.A., Hatfield, E.M.C., Hintzen, N.T., Katja Enberg6, Kell, L.T. & Simmonds, E. J. 2010. Lessons learned from stock collapse and recovery of North Sea herring: a review. ICES Journal of Marine Science, 67: 1875–1886. WGSAM, 2011. Report of the Working Group on Multispecies Assessment Methods. ICES CM 2011/SSGSUE:10. 229 pp. WGECO, 2012. Report of the Working Group on the Ecosystem Effects of Fishing Activities. ICES CM 2012/ACOM:26. 192 pp.
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.5.3 - PURSE SEINE

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	The individual components of the IMR research and stock assessment programmes (and complementary programmes at other Norwegian institutions) all contribute to the long-term aim of modelling the marine ecosystem. It is understood implicitly, if not explicitly, that each of the fish stocks plays a role within the ecosystem and variations in abundance of stocks, such as NS&SH, can and quite probably do influence the status of both prey and predator populations. Whilst not all these interactions have been investigated in full, they are understood in principle. The research programmes and associated monitoring of the marine environment, primary and secondary production, fish stocks, birds and marine mammals all contribute towards detecting any risk or adverse environmental effects.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Ecosystem modelling is an on-going aspect of IMR (and other Norwegian research institutions) investigations. Even those elements for which there are not yet specific data, many can be inferred, particularly with respect to NS&SH, on the basis of experience gained either empirically over time or elsewhere with comparable stocks and ecosystems. The main predator-prey interactions (e.g. cod, some birds, some cetaceans) around the NS&SH stock have been investigated.		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

MSC FISHERY ASSESSMENT REPORT

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
	Justification	Not all aspects of fishery–bycatch–ETP interactions have been studied in detail and until fully functioning ecosystem models have been demonstrated to work it would be premature to say that all these components of the ecosystem are *fully* understood. Nevertheless, the principles affecting each of the trophic-level interactions (predator–prey; fish–bird; fish–mammal) are understood in sufficient details to enable meaningful progress in modelling ecosystem based fishery management and make positive progress towards the long-term national objective of a healthy marine environment supporting a full range of sustainable living resources – not only but certainly including NS&SH.		
d	**Guidepost**		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Pelagic species have been subject to fishery research for many decades throughout the north Atlantic, not the least of which has been research into the NS&SH stock. Virtually all of the ecosystem-based research findings from temperate–sub-polar marine environments are directly applicable to Norway and this fishery. Consequently the main consequences of NS&SH exploitation for the Norwegian marine ecosystem can be inferred.		
e	**Guidepost**		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).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	The long-established and long-term research programmes and their associated databases are undoubtedly sufficient to support the development of strategies to manage ecosystem interactions. The Norwegian regional seas management plans are *de facto* examples of such management strategies being developed and implemented.		
References		www.imr.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Vinther, M. 2001. Ad hoc multispecies VPA tuning applied for the Baltic and North Sea		

MSC FISHERY ASSESSMENT REPORT

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
	fish stocks. ICES Journal of Marine Science, 58: 311–320. Lewy, P., & Vinther, M. 2004. A stochastic age–length-structured multispecies model applied to North Sea stocks. ICES CM 2004/FF: 20. 33 pp. Kempf, A., Floeter, J., & Temming, A. 2006. Decadal changes in the North Sea food web between 1981 and 1991—implications for fish stock assessment. Canadian Journal of Fisheries and Aquatic Sciences, 63: 2586–2602. Mackinson, S., and Daskalov, G. 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Science Series Technical Report, Cefas Lowestoft, 142. WGRED, 2008. Report of the Working Group for Regional Ecosystem Description ICES CM 2008/ACOM:47. 203 pp. Dickey-Collas, M., Nash, R.D.M., Brunel, T., van Damme, C.J.D., Marshall, C.T., Payne, M. R., Corten, A., Geffen, A.J., Peck, M.A., Hatfield, E.M.C., Hintzen, N.T., Katja Enberg6, Kell, L.T. & Simmonds, E. J. 2010. Lessons learned from stock collapse and recovery of North Sea herring: a review. ICES Journal of Marine Science, 67: 1875–1886. WGSAM, 2011. Report of the Working Group on Multispecies Assessment Methods. ICES CM 2011/SSGSUE:10. 229 pp. WGECO, 2012. Report of the Working Group on the Ecosystem Effects of Fishing Activities. ICES CM 2012/ACOM:26. 192 pp.
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.1.1 - PELAGIC TRAWL

PI 2.1.1		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	N
	Justification	With the exception of Western Baltic spring spawning herring (WBSSH), all retained species are caught in nugatory quantities (<<100 t/year) and do not meet the MSC threshold criterion for being termed main retained species; i.e. >5% the total catch of all species. Although WBSSH catches are much larger (882 t) they are still very small (<1.5%) of the total Norwegian catch of North Sea and Skagerrak herring and do not qualify as main retained species. The retained species recorded from the North Sea and Skagerrak herring (NS&SH) fishery 2010–12 are: WBSSH (882 t); mackerel (40 t purse seine) Norway pout (38 t), horse mackerel (22 t), North Sea saithe (16 t), blue whiting (5 t), sprat (3 t), whiting (3 t), North Sea haddock (2 t), silvery pout (1 t), northern hake and North Sea cod (<1 t). There is a high degree of certainty that each of the species that is caught in measurable quantities (i.e. > 1 t per year) is within or fluctuating around biologically based limits **Mackerel**: SSB = 2.68 Mt; F 0.36 (F exceeds F_{MSY} due to breakdown in management agreement but SSB still above reference levels) **Norway pout**: SSB = 205 kt; F 0.70 **Horse mackerel**: SSB = 1.66Mt; F 0.17 **Saithe**: SSB = 302 kt; F 0.31 For the other retained species: **Blue whiting**: SSB 5.13 Mt; F 0.13 **Sprat:** stock managed on basis of in-year assessment for which data are of immediate relevance. **Whiting**: North Sea whiting is relatively stable and F has been declining steadily for several years. **Northern hake:** SSB 145 kt; F 0.42. Although fishing mortality rate has been higher than desired, the stock has shown a positive trend to levels far in excess of previously recorded in the past 30 years. **North sea haddock**: SSB = 255 kt; F 0.20 **North Sea cod**: SSB = 78 kt; F 0.47 is no better than B_{lim} . Nevertheless, F has fallen below F_{pa} but remains above F_{MSY} and ICES considers that it is being harvested sustainably. As less than 1 t/year North Sea cod is taken in the NS&SH fishery its status is no immediate significance in this context. Similarly for silvery pout, for which there are no assessment data. **WBSSH**: SSB=87 936 t ; F 0.33; F has shown a steady decline over the past 5-6 years, but is still higher than FMSY; stock has been relatively stable over the same period at or about Blim. Currently there is no internationally agreed management plan or harvest control rule. Nevertheless, the ICES approach to annual assessment of this stock and its provision of advice to fishery management bodies has been basing its advice on precautionary principles. Furthermore, even in the absence of a formally agreed management plan, the ICES precautionary advice has been adopted as the basis for the EU–Norway management of this fish stock.		

PI 2.1.1		**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**		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			Y
	Justification	Target reference points are defined for; **Mackerel**: $SSB_{trigger}$ 2.20 Mt; F_{target} 0.20–0.22; MSY $B_{trigger}$ 2.2 Mt; F_{MSY} 0.22; B_{lim} 1.67 Mt; B_{pa} 2.30 Mt; F_{lim} 0.42; F_{pa} 0.23. **Horse mackerel**: F_{MSY} 0.13. **Saithe**: SSB_{MP} 200 kt; F_{MP} 0.30; MSY $B_{trigger}$ 200 kt; F_{MSY} 0.30; B_{lim} 106 kt; B_{pa} 200 kt; F_{lim} 0.60; F_{pa} 0.40. **Blue whiting**: $SSB_{trigger}$ 2.25 Mt; F_{target} 0.18; MSY $B_{trigger}$ 2.25 Mt; F_{MSY} 0.18; B_{lim} 1.50 Mt; B_{pa} 2.25 Mt. **Whiting:** F_{MP} 0.30. **NS haddock**: SSB_{MP} 100 kt; F_{MP} 0.30; MSY $B_{trigger}$ 140 kt; F_{MSY} 0.30; B_{lim} 100 kt; B_{pa} 140 kt; Fl_{im} 1.00; F_{pa} 0.70. **Northern hake:** F_{MSY} 0.24; **NS cod**: SSB_{MP} 150 kt; F_{MP} 0.40; MSY $B_{trigger}$ 150 kt; F_{MSY} 0.19; B_{lim} 70 kt; B_{pa} 150 kt; F_{lim} 0.86; F_{pa} 0.65. **Sprat and Norway pout:** Short-lived species; in-year 'real-time assessment advice. **WBSSH**: MSY $B_{trigger}$ = 110 kt; F_{MSY} 0.28; B_{lim} 90 kt; B_{pa} 110 kt.		
c	**Guidepost**	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	NA	NA	
	Justification	Not applicable: none of the retained species meet the threshold to qualify as main retained species.		
d	**Guidepost**	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.		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.1		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		
	Met?	Y		
	Justification	The measures in place are to retain, record and report all non-target commercial species, count them against their respective quota and contribute the data to the appropriate stock assessment. This is done for all retained species, including the WBSSH, which are identified and allocated to stock post hoc. These measures are appropriate to ensure that the fishery is not causing the retained species to be outside biologically based limits or hindering recovery. The measures in place for the WBSSH has reduced fishing mortality rate in recent years and stabilised stock with the most recent estimate of SSB being above B_{lim} at c. MSY $B_{trigger}$.		
References		$ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf $ACOM_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf $ACOM_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf $ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf $ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf $WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf $ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES Advice Book 9.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf $ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf $ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf $ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.1	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
	ACOM$_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5. http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.1.2 - PELAGIC TRAWL

PI 2.1.2		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are 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 a partial strategy 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 a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There are numerous stock management plans, rules and tools (TAC, quotas, minimum mesh & fish sizes, mesh and grid regulations, real-time closures) in place that are expected to maintain the retained species at levels that are highly likely to be within biologically based limits; the quantities caught in the NS&SH fishery will ensure the fishery does not hinder any stock recovery or rebuilding, including WBSSH. The operational strategy is to minimise the capture of non-target species at all times while the administrative strategy is to collect accurate and verifiable data in support of the appropriate stock assessment and to ensure that each stock is managed in accordance with its national and, or internationally agreed management plan. With respect to the WBSSH, they migrate into parts of Division IIIa and eastern Division Iva where they mix with North Sea autumn spawners. They cannot be separated in the catches and post hoc estimation of the proportions of each stock component in the catches is made by biological sampling. There are currently no specific management objectives for the stock and there is no agreed management plan in place but ICES advice on the management of the WBSS herring stock is on the basis of a transition to MSY fishing mortality targets. This system has worked well with the agreed TAC in line with the advice. Estimates of the total catch of WBSSH have not exceeded the agreed TAC since 2010. Firm control on the exploitation of the WBSS component has been achieved in part by a management measure, introduced in 2011, that allows the transfer up to 50% of Div IIIa quotas to a transfer area in Division IVa east. Monitoring shows that about 40% of the Div IIIa TAC was taken in the North Sea transfer area in 2011 and 2012. On the assumption that this strategy is maintained, and ICES advice followed it is anticipated that SSB will continue to grow above MSY $B_{trigger}$ over the next two years.		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.2		**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**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	The strategy is tested through the annual ICES stock assessments. With the exception of WBSSH, of the retained species for which average catch is >1 t per year, the annual ICES stock assessments show healthy stocks and, or appropriate levels of F. This is clear evidence that the strategy is being implemented successfully. ICES has found that North Sea whiting is relatively stable and F has been declining steadily for several years, while northern hake SSB has been increasing and F decreasing. Even North Sea cod is showing weak signs of recovery in response to the management plan and ICES considers that it is being harvested sustainably. Even in the absence of a formally agreed management plan for the WBSSH, the current strategy is beginning to show signs of working in that there has been a steady decline in fishing mortality in recent years and there are nascent signs of stock recovery. Although there is some objective basis for confidence that the partial strategy will work, the WBSSH assessment cannot be viewed with high confidence as it is dependent on a range of stock distribution assumptions and post hoc biological sampling to estimate annual catch levels.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	With the possible exception of WBSSH, annual ICES stock assessments showing sustained healthy state of retained species' stocks and, or appropriate levels of F provide clear evidence that the strategy is being implemented successfully. ICES has found that North Sea whiting is relatively stable and F has been declining steadily for several years, while northern hake SSB has been increasing and F decreasing. Even North Sea cod is showing weak signs of recovery and ICES considers that it is being harvested sustainably. As with whiting and North Sea cod, there is some evidence that the strategy adopted to manage the WBSSH fishery and optimise stock recovery is showing signs of working; i.e. it is being implemented successfully. Nevertheless, it will require firm evidence that the stock has recovered to levels >MSY Btrigger before it is deemed to show clear evidence, and even then there may be doubts based on post hoc estimation of catch allocations.		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.2		**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**		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	With the possible exception of WBSSH, annual ICES stock assessments showing sustained healthy state of retained species' stocks and, or appropriate levels of F provide clear evidence that the strategy is being implemented successfully. ICES has found that North Sea whiting is relatively stable and F has been declining steadily for several years, while northern hake SSB has been increasing and F decreasing. Even North Sea cod is showing weak signs of recovery and ICES considers that it is being harvested sustainably. As with whiting, hake and North Sea cod, there is some evidence that the strategy adopted for WBSSH is achieving its overall objective; there has been a sustained reduction in fishing mortality rate in recent years, SSB has stabilized and is showing early, albeit weak, signs of increase.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
	Justification	Sharks do not contribute to the retained catch in this fishery.		
References		ACOM$_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf ACOM$_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf ACOM$_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.2	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
	/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf $ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf $ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf $WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf $ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES Advice Book 9.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf $ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf $ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf $ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf $ACOM_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5. http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.1.3 - PELAGIC TRAWL

PI 2.1.3		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	All commercial fish species must be retained, recorded and landed. All records are subject to scrutiny at sea and on landing. This is complemented by an observer programme and more detailed data from a reference fleet. There is a comprehensive biological sampling programme, which informs accurate and verifiable analytical assessments of the consequences for the status of all bar WBSSH among retained species. The catches of WBSSH are all estimated and allocated on the basis on post hoc biological sampling and analysis rather than straightforward species identification and recording at the time of capture. While such data meet the SG80 criteria they fall short of the SG100 standard of 'accurate and verifiable'.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The quantity of data gathered is undoubtedly of suitable quality to make reliable quantitative assessments of the principal retained species. Nevertheless, the catches of each of the retained species are so trivial that there is a high degree of certainty that this fishery is having no measureable or adverse effect on any of the corresponding stocks. The post hoc biological sampling and analysis upon which estimates of WBSSH catches are based is sufficient to estimate outcome status with respect to biologically based limits but not with a high degree of confidence.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.1.3		**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**		
	Justification	With the possible exception of WBSSH, the quantities of data gathered on retained species are of sufficient quality to support their respective stock assessments and management strategies with a high degree of certainty that the respective strategies are achieving their objectives. In particular, the catches taken for each of the retained species are so trivial that there is a high degree of certainty that this fishery is having no measureable or adverse effect on any of the corresponding stocks. The total herring catch data and the post hoc biological sampling and analysis that provides the estimate of WBSSH catches in the NS&SH fishery are adequate to support a strategy to manage retained species, and evaluate whether the strategy is achieving its objective but it is too early to say with a high degree of certainty that the strategy is meeting its objectives.		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y
	Justification	All commercial fish species must be retained, recorded and landed. All records are subject to scrutiny at sea and on landing. WBSSH are monitored post hoc to a level consistent with a quantitative assessment for management of the fishery. The landing monitoring programme is complemented by an observer programme and more detailed data from a reference fleet. There is a comprehensive biological sampling programme, not least on WBSSH, which informs analytical assessments of the consequences for the status of retained species. These data and assessments are in sufficient detail to assess ongoing mortalities to all retained species. In particular, the quantities taken for each of the retained species, except WBSSH, are so trivial relative to targeted fisheries for retained species stocks that there is a high degree of certainty that this fishery is having no measureable or adverse effect on any of the corresponding stocks.		
References		ACOM$_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf HAWG, 2013. Report of the Herring Assessment Working Group for the Area South of 62 N. ICES Annual Science Meeting CM 2013/ACOM:06. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/HAWG/HAWG%202013.pdf ACOM$_{WBSSH}$, 2013. Ecoregion: North Sea Herring in Division IIIa and Subdivisions 22–24 (western Baltic spring spawners). ICES Advice Book 6.4.8. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf ACOM$_{mack}$, 2012. Widely distributed and migratory stocks: Mackerel in the Northeast Atlantic (combined Southern, Western, and North Sea spawning components). ICES Advice Book 9.4.2. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/mac-nea.pdf WGMEGS, 2012. Report of the Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS). ICES CM 2012/SSGESST:04. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGESST/2012/WGMEGS12.pdf WGNSSK, 2012. ICES CM 2012/ACOM:13. Report of the Working Group on the		

MSC FISHERY ASSESSMENT REPORT

PI 2.1.3	**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**
	Assessment of Demersal Stocks in the North Sea and Skagerrak. ICES CM 2012/ACOM:13. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGNSSK/Sec%2005%20Norway%20Pout%20in%20ICES%20Subarea%20IV%20and%20Division%20IIIa%20(May%202012).pdf $ACOM_{NP}$, 2012. North Sea: Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). ICES Advice Book 6.4.20. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/nop-34%20oct.pdf $ACOM_{NPMP}$, 2012. Joint EU-Norway request on management measures for Norway pout. Report of the ICES Advisory Committee 2012. ICES Advice, 2012. Book 6, Section 6.3.3.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/Special%20Requests/EUNorway%20Norway%20pout.pdf $WGWIDE_{HM}$, 2012. Report of the Working Group on Widely Distributed Stocks (WGWIDE). ICES CM2012 ACOM/7. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/WGWIDE/Sec%2005%20Western%20Horse%20Mackerel.pdf $ACOM_{HM}$, 2013. Widely distributed and migratory stocks: Horse mackerel (*Trachurus trachurus*) in Divisions IIa, IVa, Vb, VIa, VIIa–c,e–k, and VIIIa–e (Western stock). ICES Advice Book 9.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/hom-west.pdf ACOMsaithe, 2012. Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall)). ICES Advice Book 6.4.12. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/sai-3a46.pdf $ACOM_{BW}$, 2012. Widely distributed and migratory stocks: Blue whiting in Subareas I–IX, XII, and XIV. ICES Advice Book 9.4.4. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/whb-comb.pdf $ACOM_{sprat}$, 2012. North Sea: Sprat in the North Sea (Subarea IV). ICES ADVICE Book 6.4.18. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-nsea.pdf $ACOM_{spratdiv3}$, 2012. North Sea: Sprat in Division IIIa. ICES ADVICE Book 6.4.17. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/Spr-IIIa.pdf $ACOM_{whit}$, 2012. Ecoregion: North Sea – Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel). ICES Advice Book 6.4.5. http://www.ices.dk/committe/acom/comwork/report/2012/2012/whg-47d.pdf ACOMhadd, 2012. Ecoregion North Sea: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice Book 6.4.3. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/had-34.pdf IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.2.1 - PELAGIC TRAWL

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	Y
	Justification	All non-target species are caught in minute quantities relative to the target species. Where non-target commercial species are caught in measurable quantities, they are recorded as part of the catch (see P2.1, retained species above). Reference-fleet records support the industry contention that the occurrence of any non-target bycatch is extremely rare; indeed, in the pelagic trawl fisheries (all target fisheries combined) the bycatch data show nothing other than gurnards and velvet belly dogfish. In each case, these records represent <0.5% of the total number of fish recorded in the reference-fleet data set.		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	For purely commercial reasons, skippers wish to minimise the capture of non-target species at all times. Data collected from the observer fleet illustrate that the operational measures adopted are successful in meeting the skippers' objective. The quantity of bycatch taken in the NS&SH fishery is not sufficient to place the species or stock at risk of being outside safe biological limits.		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		

MSC FISHERY ASSESSMENT REPORT

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**
	Justification	For purely commercial reasons, skippers wish to minimise the capture of non-target species at all times. Data collected from the observer fleet illustrate that the operational measures adopted are successful in meeting the skippers' objective. The quantity of bycatch taken in the NS&SH fishery is not sufficient to place the species; stock at risk of being outside same biological limits.
References		IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.2.2 - PELAGIC TRAWL

PI 2.2.2		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch 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 a partial strategy in place, if necessary, that is expected to maintain the main bycatch 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 a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	For purely commercial reasons, skippers wish to minimise the capture of non-target species at all times. Data collected from the observer fleet illustrate that the operational measures adopted are successful in meeting the skippers' objective.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	Data collected from the reference fleet, and verified during the consultation with IMR and the DoF, indicate that the strategy works successfully and that bycatch is virtually non-existent.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y

MSC FISHERY ASSESSMENT REPORT

PI 2.2.2		**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**		
	Justification	Data collected from the reference fleet, and verified during the consultation with IMR and the DoF, indicate that the strategy works successfully and that bycatch is virtually non-existent.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	Data collected from the reference fleet, and verified during the consultation with IMR and the DoF, indicate that the strategy works successfully and that bycatch is virtually non-existent. Consequently, it is certain that the fishery does not pose a serious risk or cause irreversible harm to bycatch populations.		
References		IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.2.3 - PELAGIC TRAWL

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	The reference-fleet observer programme gathers quantitative information that provides an index of the aggregated total bycatch across all pelagic fisheries, not just the NS&SH fishery. Nevertheless, these data are sufficient to corroborate the industry's contention that the capture of non-target species (retained and bycatch) is very rare. Consequently, there is a clear implication that the consequences of such bycatch for the respective stock status is ≥zero.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	The reference-fleet observer programme gathers quantitative information that provides an index of total bycatch only. Nevertheless, the trivial numbers of bycatch species caught provide a high degree of certainty that the fishery is not having an adverse effect with respect to biological limits.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage ~~retained~~ bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	The reference-fleet observer programme gathers quantitative information that provides an index of total bycatch only. Nevertheless, these data are sufficient to demonstrate with a high degree of certainty that the strategy to minimise bycatch is achieving its objectives.		

MSC FISHERY ASSESSMENT REPORT

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
d	**Guidepost**		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 effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	Y
	Justification	The reference-fleet observer programme provides sufficient detail to assess whether or not there is any significant change in catch composition of characteristics that might possibly have meaningful implications for the status of bycatch species.		
References		IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.3.1 - PELAGIC TRAWL

PI 2.3.1		The fishery meets national and international requirements for the 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of 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.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	Y
	Justification	Reference-fleet observers gather data on ETP interactions. Although the demersal fisheries reference-fleet data provide evidence of fishery interactions with seabirds and mammals, no such instances were seen in the purse-seine fisheries. The absence of such evidence to the contrary supports the industry's contention that although there may be the occasional capture of birds diving to take fish during hauling, it is neither a regular nor frequent occurrence. Furthermore, the low numbers of ETP species (principally elasmobranchs) recorded by the reference-fleet observers provide a high degree of certainty that direct interactions between the NS&SH fishery and ETP species do not cause significant detrimental effects. Thus, ≥zero observations provide a high degree of certainty any such interactions provide sufficient detail to assess ongoing mortalities to ETP species and ensure that they comply with Norway's national and international obligations.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	Y
	Justification	The low numbers of ETP species (principally elasmobranchs) recorded by the reference-fleet observers provide a high degree of certainty that direct interactions between the NS&SH fishery and ETP species do not cause significant detrimental effects.		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y

PI 2.3.1		**The fishery meets national and international requirements for the 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**
	Justification	Over the past 70 years the various pelagic (and demersal) stocks in the NE Atlantic have waxed and waned over 2–3 orders of magnitude without evidence of significant detrimental effects on other prey–predator species. Furthermore, IMR ecosystem modelling of Norwegian fisheries, long-tem monitoring of marine mammals by IMR, seabirds by NINA and ICES reviews of seabird and marine mammal–fishery interactions have not identified any cause for concern with respect to the NS&SH fishery. Thus, there is a high degree of certainty that there are no detrimental indirect effects of the NS&SH fishery on ETP species.
References		http://www.birdlife.org/seabirds/index.html http://www.nina.no/ninaenglish/Publications.aspx WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt med focus på fiske med garn og line. NINA Rapport 719. http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, Book 1.5.1.3. http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf $IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564 Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, 41. doi:10.1016/S0165-7836(99)00013-2 IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Tjelmeland, S. & Lindstrøm, U. 2005. An ecosystem element added to the assessment of Norwegian spring spawning herring: implementing predation by minke whales ICES Journal of Marine Science, 62 (2005), pp. 285–294. Lindstrøm, U., Smoutb, S., Howell, D. & Bogstad, B. 2009. Modelling multi-species interactions in the Barents Sea ecosystem with special emphasis on minke whales

MSC FISHERY ASSESSMENT REPORT

PI 2.3.1	**The fishery meets national and international requirements for the 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**	
	and their interactions with cod, herring and capelin. Proceedings of the ECONORTH Symposium on Ecosystem Dynamics in the Norwegian Sea and Barents Sea. Deep Sea Research 56, 2068–2079.	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.3.2 - PELAGIC TRAWL

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y
	Justification	In addition to the skippers' operational strategy to minimise the capture of any non-target species (fish, birds or mammals), there is the national strategy set out in the Norwegian Marine Resources Act and the regional seas management plans that explicitly requires an ecosystem approach to marine environmental management. The act also requires that all fish species are retained, recorded and landed and that vessels equipped with elogbooks must record interactions with seabirds and marine mammals. Norwegian fishery and conservation agencies monitor the fishery, bird and mammal populations. Where there is deemed to be cause for concern, e.g. relatively high catches of *S. marinus* or spurdogs, specific measures are implemented, e.g. move-on and area closures. There are also permanent and seasonal closures of inshore waters in the vicinity of key seabird nesting sites.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N

MSC FISHERY ASSESSMENT REPORT

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Justification	The low–zero numbers of ETP species recorded by the reference-fleet observers indicate that the operational measures adopted by skippers are effective in minimising interactions with and capture of non-target fish, bird and mammal species. The reference-fleet data, however, provide only an index of what is happening across pelagic fisheries as a whole and do not lend themselves to rigorous analysis. In contrast, the elogbook system has now been rolled out across all the (larger) vessels in the Norwegian fleet and this requires that all fish, bird and mammal captures are recorded. Unfortunately, it is not anticipated that any analysis of these logbook records will be made before 2015.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	Marine mammal and seabird stock monitoring and abundance estimates are made by IMR and NINA, and reviewed by ICES, OSPAR and NAMMCO. The absence of any specific concerns with respect to these populations and the NS&SH fishery is clear evidence that the strategy is being implemented successfully. There are specific fishery management measures, e.g. move-on and area closures, to safeguard red-list fish species such as *S. marinus* and spurdogs. These measures are robustly enforced and implemented successfully.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	All seabird and marine mammal populations are monitored; currently, none are deemed to be specific cause for concern, least of all with respect to the NS&SH fishery. Catch numbers for red-list fish species, such as *S. marinus* and spurdog, are low and not a cause for concern. i.e. the operational strategy to minimise interactions with non-target species is achieving its objective.		
References		http://www.birdlife.org/seabirds/index.html http://www.nina.no/ninaenglish/Publications.aspx WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt		

MSC FISHERY ASSESSMENT REPORT

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
	med focus på fiske med garn og line. NINA Rapport 719. http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, Book 1.5.1.3. http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf $IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564 Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, 41. doi:10.1016/S0165-7836(99)00013-2 IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf Tjelmeland, S. & Lindstrøm, U. 2005. An ecosystem element added to the assessment of Norwegian spring spawning herring: implementing predation by minke whales ICES Journal of Marine Science, 62 (2005), pp. 285–294. Lindstrøm, U., Smoutb, S., Howell, D. & Bogstad, B. 2009. Modelling multi-species interactions in the Barents Sea ecosystem with special emphasis on minke whales and their interactions with cod, herring and capelin. Proceedings of the ECONORTH Symposium on Ecosystem Dynamics in the Norwegian Sea and Barents Sea. Deep Sea Research 56, 2068–2079.
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.3.3 - PELAGIC TRAWL

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	Y
	Justification	Data on seabirds and marine mammal populations are gathered and assessed by NINA and IMR respectively. Specifically, the pelagic fisheries are monitored through the reference fleet and data on all (red-list) fish are collected from every commercial fishing vessel. These data show that the fishery interactions with ETP species are ≥zero for which the quantitative estimate of the fishery effect on ETP status is zero.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	All fish, including red-list fish must be retained, recorded and landed. All fishing activity is subject to monitoring and enforcement measures at sea, on land and by air. It is reasonable to conclude, therefore that the information available is accurate and verifiable for the magnitude of all impacts, mortalities and injuries and the consequences for the status of red-list fish species. At present, the data on seabirds and marine mammals is limited to that gathered from the reference fleet and then by extrapolation – a practice that does not necessarily provide accurate results. Once the data from the elogbooks is available for analysis, this should improve.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy 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.
	Met?	Y	Y	N

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	In addition to monitoring the numbers of seabird and marine mammal interactions aboard the reference fleet, the total populations of these groups across Norwegian waters are also monitored by NINA and IMR, respectively, and fishery effects assessed. The same if true for critical red-list fish species such as spurdog and *S. marinus* but stock status of other red-list (elasmobranch) fish is not monitored to the same degree, principally because catch numbers are too low. In the event that their populations, and catches, were greater than is currently the case, the same conservation strategy would presumably be applied in full, e.g catch-level threshold and move-on policy, area closures, stock assessments. The same will only become true for seabirds and marine mammals once the 'e' logbook recording system is fully operational and producing verifiable information. Thus, overall, information is sufficient to measure trends and support a strategy that is less than comprehensive with respect to birds and mammals even though there is no evidence that the fishery is having a discernible effect on any ETP species or population.
References		http://www.birdlife.org/seabirds/index.html http://www.nina.no/ninaenglish/Publications.aspx WGSE, 2011. Report of the Working Group on Seabird Ecology (WGSE). ICES CM 2011/SSGEF:07. Avaialbe at http://www.nina.no/archive/nina/PppBasePdf/Rapporter%20i%20ekstern%20rapportserie/2011/Anker-Nilssen%20Report%20WGSE11.pdf AGSE, 2012. Report of the Joint ICES/OSPAR Ad hoc Group on Seabird Ecology (AGSE). ICES CM 2012/ACOM:82 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2012/AGSE/agse_2012.pdf Fangel, K., Wold, L.C, Aas, Ø., Christensen-Dalsgaard, S., Qvenild, M. & Anker-Nilssen, T. 2011. Bifangst av sjøfugl i norske kystfiskerier. Et kartleggings- og metodeutprøvingsprosjekt med focus på fiske med garn og line. NINA Rapport 719. http://www.nina.no/archive/nina/PppBasePdf/rapport/2011/719.pdf ACOM, 2008. Interactions between fisheries and seabirds in EU waters ICES Advice 2008, Book 1.5.1.3. http://www.ices.dk/committe/acom/comwork/report/2008/Special%20Requests/EC%20Interactions%20between%20fisheries%20and%20seabirds%20in%20EU%20waters.pdf $IMR_{mammals}$, 2011. The Marine Mammal Report 2011. Bergen, IMR. http://www.imr.no/nyhetsarkiv/2011/mai/sjopattedyrrapporten_pa_engelsk/en WGMME, 2013. Report of the Working Group on Marine Mammal Ecology (WGMME). ICES CM 2013/ACOM:26 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGMME/wgmme_2013.pdf JNCC, 2009. Marine Mammal Bycatch. http://www.jncc.gov.uk/page-1564 Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, S.P. & Pouvreau, S., 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research*, 41. doi:10.1016/S0165-7836(99)00013-2 IMR, 2010. The Norwegian reference fleet – a trustful cooperation between fishermen and scientists. Focus on Marine Research 1 – 2010. http://www.imr.no/filarkiv/2011/10/referencefleet.web.2010.pdf_1/en Bowering, R., Storr-Paulsen, M., Tingley, G., Bjørkan, M., Vølstad, H. H., Gullestad, P. & Lorentsen, E. (2011). *Evaluation of the Norwegian Reference Fleet*. Institute of Marine Research, Bergen. Available at http://www.imr.no/filarkiv/2011/11/hi-rapp_16-2011_norsk.pdf_1/en Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of

MSC FISHERY ASSESSMENT REPORT

PI 2.3.3	**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.4.1 - PELAGIC TRAWL

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely 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.
	Met?	Y	Y	Partial
	Justification	Pelagic trawls avoid seabed contact at all cost; to do anything else risks damage that could incur great cost. Consequently, it is universally accepted that pelagic gears are the least likely of all fishing methods to have any adverse effect on seabed habitat structure or function; therefore there has been no direct research. In the absence of specific research, evidence is inferential rather than substantive, hence the partial score.		
References		www.mareano.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.4.2 - PELAGIC TRAWL

PI 2.4.2		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Norway maintains the MAREANO programme to map sensitive habitats and has established 'no fishing zones' to protect sensitive marine habitats (SMH). These regulations apply to all towed gears, although they are primarily aimed at bottom-contact fisheries. The MAREANO mapping programme is ongoing and there are regional seas management plans that include monitoring sensitive habitats. The annual status reports of each of the regional seas are presented to Parliament. Additionally, the Marine Resources Act requires an ecosystem approach to safeguarding biodiversity in addition to managing exploited resources. All vessels that can fish in proximity to SMHs are fitted with VMS to monitor compliance. Operationally, pelagic-vessel strategy is to avoid bottom contact in such areas at all cost; administratively, the strategy is to monitor the distribution of fishing activity in the vicinity of SMHs and enforce the regulations with rigour.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	Y
	Justification	Economic imperatives ensure that skippers avoid bottom contact with pelagic gear in SMH areas. In addition to monitoring the fishery, seabed habitats continue to be monitored and mapped through the MAREANO programme; while this work continues to identify areas that have been affected by bottom-contact towed gears it has not identified any habitat concerns with respect to pelagic fishing gears.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y

MSC FISHERY ASSESSMENT REPORT

PI 2.4.2		**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**		
	Justification	Commercial self- interest encourages pelagic skippers to avoid seabed contact in any area that might be deemed SMH. There is 'clear evidence' in that the authorities record or prosecute the rare instances of incursions into protected areas but without exception, such prosecutions involve the demersal fishing industry, not the pelagic sector.		
d	**Guidepost**			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	The on-going MAREANO and regional seas monitoring programmes provide some evidence that the strategy is providing overall protection to sensitive habitats and therefore achieving its objectives. But more generally, evidence is derived by inference from the established fishing practice and lack of contact between pelagic gears and seabed habitats.		
References		www.mareano.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.4.3 - PELAGIC TRAWL

PI 2.4.3		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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	The MAREANO programme has developed very detailed maps of seabed habitats across many of the principal fishing grounds in Norwegian waters and is ongoing. Critically sensitive habitats are protected from towed gear fishing by closed areas and by a general prohibition on all bottom contact fishing in 'new' areas at depths greater than 1000 meters. This latter restriction does not apply to the pelagic sector as it is recognised that they do not pose a threat to marine habitats.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	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 of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	Y
	Justification	The effect of pelagic gears on sensitive habitats has not been quantified other than by the general observation that such physical impact would entail a penurious financial penalty for the skipper in terms of damaged fishing gear and lost fishing time; this is particularly true for pelagic trawls that come into contact with any seabed, whether rough or smooth. Consequently, it is generally accepted that the quantified effect of pelagic trawls is zero.		
c	**Guidepost**		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).	Changes in habitat distributions over time are measured.
	Met?		Y	N

MSC FISHERY ASSESSMENT REPORT

PI 2.4.3		**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**
	Justification	Habitats continue to be mapped and are monitored through the ongoing MAREANO programme. Although it has now been going for several years, it is still in the process of baseline mapping and has not reached the point where changes in habitat distribution can be measured. Nevertheless, it is recognised that pelagic gear does not pose any risk to habitat abundance or distribution.
References		www.mareano.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.5.1 - PELAGIC TRAWL

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	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.	There is evidence 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.
	Met?	Y	Y	Partial
	Justification	Norway maintains extensive ecosystem monitoring and management programmes that review the role of fisheries and target species' trophic role. A key element of this is the annual assessment, management advice and landing (which have fluctuated by three orders of magnitude in recent decades) for the NSea&SkH fisheryWhile these variations have been linked to the waxing and waning of other stocks, e.g. NE Arctic cod, there has never been any substantive evidence of irreversible harm. The Marine Resources Act makes it an explicit requirement that an ecosystem approach is taken to all aspects of marine resource management and this provides the statutory framework for the regional seas' management plans. It is highly unlikely therefore that the fishery will disrupt ecosystem structure or function. Nevertheless, such conclusions are drawn by inference rather than substantiated facts, hence the reduced score.		
References		www.imr.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.5.2 - PELAGIC TRAWL

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	Y
	Justification	The strategy is to establish a marine environment and sustainable resources to make a full and long-term contribution to the Norwegian economy. The Norwegian Marine Resources Act has an explicit requirement to take an ecosystem approach to resource management and exploitation. The act provides the statutory basis for the suite of regional seas management plans, each aimed at monitoring and safeguarding the status of the marine environment and the resources it supports. It is implicit in the IMR long- term objective for developing a Norwegian ecosystem model that there is a plan to manage Norwegian fisheries, not the least of which is the NS&SH fishery, and maintain the stocks at levels consistent with the Norwegian strategy for rational utilization of all their marine resources.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy 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.	The strategy, which consists of a plan, contains 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. 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.
	Met?	Y	Y	Y

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
	Justification	The Norwegian Marine Resources Act has an explicit requirement to take an ecosystem approach to resource management and exploitation. The act provides the statutory basis for the suite of regional seas management plans, each aimed at monitoring and safeguarding the status of the marine environment and the resources it supports. It is implicit in the IMR long term objective of developing a Norwegian ecosystem model that there is a plan to manage Norwegian fisheries, not the least of which is the NS&SH fishery, and maintain the stocks at levels consistent with the Norwegian strategy for rational utilization of all their marine resources. Measures include the MAREANO mapping programme that monitors, inter alia, anthropogenic interactions with the seabed and informs appropriate management decisions, e.g. coral closed areas. There are fishery biological and technical conservation measures for safeguarding stocks and managing fisheries and the interactions with other animals. In addition, IMR and other Norwegian research institutions are actively engaged in developing and refining comprehensive ecosystem–resource models to underpin their environmental and resource management. All management measures are backed up by a vigorous and rigorous enforcement regime.		
c	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	Y
	Justification	Prior experience from Norwegian waters (e.g. cod stock recovery; MAREANO mapping and closed areas; biological and technical measures) and elsewhere in the north Atlantic suggests that the Norwegian government's approach is not only a plausible and acceptable approach to fishery-ecosystem management but is one that is likely to yield a positive long-term contribution to sustainability.		
d	**Guidepost**		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	Y
	Justification	Fishery enforcement is robust and demonstrates its effectiveness through warnings, administrative penalties and court action where appropriate. IMR – ICES stock assessments have shown, and continue to show that the fishery management measures are effective at rebuilding stocks and maintaining them at high levels of productivity. The MAREANO programme continues to build a database of Norwegian seabed habitats and anthropogenic effects.		

MSC FISHERY ASSESSMENT REPORT

PI 2.5.2	**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**
References	www.imr.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 2.5.3 - PELAGIC TRAWL

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	The individual components of the IMR research and stock assessment programmes (and complementary programmes at other Norwegian institutions) all contribute to the long-term aim of modelling the marine ecosystem. It is understood implicitly, if not explicitly, that each of the fish stocks plays a role within the ecosystem and variations in abundance of stocks, such as NS&SH, can and quite probably do influence the status of both prey and predator populations. Whilst not all these interactions have been investigated in full, they are understood in principle. The research programmes and associated monitoring of the marine environment, primary and secondary production, fish stocks, birds and marine mammals all contribute towards detecting any risk or adverse environmental effects.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Ecosystem modelling is an on-going aspect of IMR (and other Norwegian research institutions) investigations. Even those elements for which there are not yet specific data, many can be inferred, particularly with respect to NS&SH, on the basis of experience gained either empirically over time or elsewhere with comparable stocks and ecosystems. The main predator-prey interactions (e.g. cod, some birds, some cetaceans) around the NS&SH stock have been investigated.		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
	Justification	Not all aspects of fishery–bycatch–ETP interactions have been studied in detail and until fully functioning ecosystem models have been demonstrated to work it would be premature to say that all these components of the ecosystem are *fully* understood. Nevertheless, the principles affecting each of the trophic-level interactions (predator–prey; fish–bird; fish–mammal) are understood in sufficient details to enable meaningful progress in modelling ecosystem based fishery management and make positive progress towards the long-term national objective of a healthy marine environment supporting a full range of sustainable living resources – not only but certainly including NS&SH.		
d	**Guidepost**		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Pelagic species have been subject to fishery research for many decades throughout the north Atlantic, not the least of which has been research into the NS&SH stock. Virtually all of the ecosystem-based research findings from temperate–sub-polar marine environments are directly applicable to Norway and this fishery. Consequently the main consequences of NS&SH exploitation for the Norwegian marine ecosystem can be inferred.		
e	**Guidepost**		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).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	The long-established and long-term research programmes and their associated databases are undoubtedly sufficient to support the development of strategies to manage ecosystem interactions. The Norwegian regional seas management plans are *de facto* examples of such management strategies being developed and implemented.		
References		www.imr.no Skaret, G. and Pitcher, T.J. (2006) An Estimation of Compliance of the Fisheries of Norway with Article 7 (Fisheries Management) of the FAO (UN) Code of Conduct for Responsible Fishing. 19 pages in Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2). ftp://ftp.fisheries.ubc.ca/codeConduct/CountriesCodePDF/Norway-CCRF.pdf		

MSC FISHERY ASSESSMENT REPORT

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.1.1

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	Norway has a well-established system for fisheries management, which has evolved over more than a century and is now codified in the 2008 Marine Resources Act. The Act provides for a formal system of cooperation between regulatory bodies of governance, such as the Ministry of Fisheries and Coastal Affairs, the Directorate of Fisheries and the Coast Guard, and further for cooperation between management authorities and scientific research institutes, primarily the Institute of Marine Research. The 2008 Integrated Management Plan for the Norwegian Sea provides for cooperation between different sector authorities, such as the Ministry of Fisheries and Coastal Affairs and the Ministry of Environment. Norway and the EU concluded an agreement on the management of North Sea and Skagerrak herring in 1998. The agreement was revised first in 2004 and then in 2008. It comprises binding procedures related to the regulation of the fisheries, including the settlement and allocation of quotas. The national and international legal documents refer to and are in compliance with relevant international agreements, such as the 1982 Law of the Sea Convention and the 1995 Fish Stocks Agreement. The system is considered to be effective insofar as it constitutes a coherent set of rule-making practices at national and international level.		
b	**Guidepost**	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
	Met?	Y	Y	N
	Justification	At the national level in Norway, there is an effective, transparent dispute resolution system in place, as fishermen can take their case to court if they do not accept the rationale behind an infringement accusation by enforcement authorities, or the fees levied against them. Verdicts at the lower court levels can be appealed to higher levels. There are instances from recent years that management authorities have lost cases against fishermen and accepted the verdict, which is a clear demonstration that the system works. At the international level, a state can institute proceedings against another state through mechanisms such as the International Court of Justice and the International Tribunal for the Law of the Sea. Disputes between Norway and EU are solved within the frameworks of the 2008 agreement on the regulation of the North Sea and Skagerrak herring fishery, and the annual fisheries consultations. The system is considered to be effective insofar as no major disputes have emerged, although it has not been tested and proven that this is the case.		
d	**Guidepost**	The management system has a mechanism to generally respect 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.	The management system has a mechanism to observe 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.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	N
	Justification	The Norwegian system for fisheries management includes various mechanisms that generally respect and observe the rights of the coastal population along the country's northern, western and southern coast. For the most important species, significantly and proportionately larger quota shares are allotted to coastal fisheries than to the ocean going fleet. Another example is the support provided by the authorities for the transport of fish from vessels in the country's remote areas to statutory landing points. However, this falls short of formal commitments as the mechanisms are not required by law and can be abolished as a result of changes in political priorities. These national arrangements are not in conflict with international obligations. At the international level the historical fishing rights of countries particularly depending on fishing for food and livelihood are generally respected and observed through the appropriate regional fisheries management bodies, e.g. NEAFC and JNRFC.		

MSC FISHERY ASSESSMENT REPORT

PI 3.1.1	**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**
References	Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) Interviews with representatives of the Ministry of Fisheries and Coastal Affairs, Directorate of Fisheries, the Norwegian Fishermen's Association and the Fishermen's Sales Organization for Pelagic Fish during site visit Report to the Storting No. 37 (2012–2013) Integrated Management of the Marine Environment in the North Sea and Skagerrak (Management Plan) Meld.St. 49 (2012-2013) Fiskeriavtalane Noreg har inngått med andre land for 2012 og fisket etter avtalane I 2011 og 2012, Oslo: Ministry of Fisheries and Coastal Affairs. Analyse av Norges avtaler og samarbeid med EU på fiskeriområdet, Rapport # 4, Oslo: Europautredningen, 2011.

OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.1.2

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	Y
	Justification	The most important organizations involved in Norwegian fisheries management are government bodies such as the Ministry of Fisheries and Coastal Affairs, the Directorate of Fisheries and the Coast Guard, sales organizations such as Norwegian Fishermen's Sales Organization for Pelagic Fish (Norges Sildesalgslag), fishermen's organizations such as the Norwegian Fishermen's Association (Norges Fiskarlag) and environmental NGOs such as Greenpeace, WWF and the Norwegian Society for the Conservation of Nature (Norges Naturvernforbund). The roles, functions and responsibilities of the various actors are clearly defined in long-standing practice and are now codified in the Marine Resources Act. According to interviews at site visit, they are well understood by all involved entities in all areas of responsibility and interaction. At the EU level, the Regional Advisory Councils (RACs) are important institutional arrangements in the management of shared stocks in the North Sea and Skagerrak, in this case the pelagic RAC.		
b	**Guidepost**	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	Y

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
	Justification	Norway has a long tradition of corporate policy-and decision-making in the fisheries sector, with continuous consultation and close cooperation between government agencies and user-group organizations, in particular the Norwegian Fishermen's Association but also the more specialized organizations such as the Fishermen's Sales Organization for Pelagic Fish. As these organizations have regional branches, whose representatives are actively involved in policy-making, local knowledge is also taken into consideration in the management process. The Regulatory Meetings organized twice a year are open to all; user-group organizations attend on a regular basis, various NGOs participate regularly. In addition there is regular day-to-day contact by telephone and email between authorities, user-groups and other interested parties. At interviews during the site visit, representatives of both management authorities and user-groups expressed the view that the two work *together* towards the common goal of sustainable fisheries management, not *against* each other. Representatives of the Ministry of Fisheries and Coastal Affairs also stressed the importance of this 'open-door' policy in order to ensure the legitimacy of regulations. User-groups such as the Norwegian Fishermen's Association also participate at the international level, e.g. in the annual negotiations with the EU and Russia. NGOs do not take part in these negotiations, but have since 2001 been given observer status at meetings in the regional fisheries organization in the area, NEAFC. Observers are also welcome at meetings in the OSPAR Commission, whose remit is the protection of the marine environment in the North Sea. Norwegian management authorities actively seek advice from user-groups in preparation for international consultations and negotiations. As an example, a seminar for all interested parties was organized in Svalbard in 2012 in order to discuss upcoming revisions of management plans in Coastal State negotiations. Another example is a recent meeting with user-groups, NGOs and scientific communities to discuss Norwegian policies in the ICES Working Group on Skagerrak. According to interviews at site visit, management authorities often amend their policies to conform to the views of user-groups and other interested parties. They explain how this information is used or not used in the ensuing policy-making process.		
c	**Guidepost**		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	Y

MSC FISHERY ASSESSMENT REPORT

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**
	Justification	All interested parties are given the opportunity to participate in the Regulatory Meetings, which is the most important formal arena for interaction between fisheries management authorities and the public in Norway. Meetings are announced publicly and all relevant stakeholders are well informed about where and when the meetings take place.The situation is similar at the international level, where user-groups participate in Coastal State negotiations, while NGOs may participate as observers at meetings in regional organizations as NEAFC and OSPAR. NGOs are actively invited to the pelagic RAC.
References		Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) Interviews with representatives of the Ministry of Fisheries and Coastal Affairs, Directorate of Fisheries, the Norwegian Fishermen's Association and the Fishermen's Sales Organization for Pelagic Fish during site visit www.pelagic-rac.org
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.1.3

PI 3.1.3		**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**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	Y
	Justification	The 2008 Marine Resources Act, which covers all living marine resources, requires that Norwegian fisheries management be guided by the precautionary approach and by an ecosystem approach that takes into account habitats and biodiversity. The same objectives are found in the most relevant policy documents, such as the integrated management plans for the Barents and Norwegian Seas, and for the North Sea and Skagerrak. At the regional level, the management plan for the North Sea and Skagerrak herring is declared to be consistent with a precautionary approach, intended to constrain harvesting within safe biological limits and designed to provide for sustainable fisheries.		
References		Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) Report to the Storting No. 8 (2005–2006) Integrated Management of the Marine Environment in the Barents Sea and Ocean Areas around Lofoten (management plan). Report to the Storting No. 37 (2008–2009) Integrated Management of the Marine Environment in the Norwegian Sea (management plan) Report to the Storting No. 37 (2012–2013) Integrated Management of the Marine Environment in the North Sea and Skagerrak (Management Plan)		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.1.4

PI 3.1.4		**The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	Y
	Justification	The management system provides for negative incentives designed to prevent fishers from violating regulations (see 3.2.3 on the enforcement system for details), designed to meet the outcomes expressed by MSC Principles 1 and 2 (see 3.1.3 and 3.2.1 on the objectives of the general and fishery-specific management systems, respectively). These incentives are subject to regular internal review of enforcement policies. A risk-based framework aimed at utilizing resources to optimize compliance at any given moment is applied, implying that priorities are regularly amended. Positive incentives include support for research on e.g. gear improvements (the CRISP programme) and for the transport of fish from vessels in the country's remote areas to statutory landing points. The management system does not include any subsidies that contribute to unsustainable fishing or ecosystem degradation. Subsidies to the fishing fleet were terminated in 1990 following the agreement between the European Free Trade Area signatories, negotiated in preparation of the European Economic Area Agreement.		
References		Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) Interviews with representatives of the Ministry of Fisheries and Coastal Affairs, Directorate of Fisheries, the Norwegian Fishermen's Association and the Fishermen's Sales Organization for Pelagic Fish during site visit		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
	Met?	Y	Y	Partial
	Justification	Long-term objectives for the fishery are defined in Norwegian legislation and policy documents (see 3.1.3), as well as in the management plan for the North Sea and Skagerrak herring fishery: fisheries management consistent with the precautionary approach intended to constrain harvesting within safe biological limits and designed to provide for sustainable fisheries. The management plan further provides for specific reference points for spawning stock biomass and fishing mortality. Short-term objectives explicitly addressed in Norwegian fishery legislation include avoiding that TACs are exceeded, that discard does not take place and that catch of non-target species is minimized, which is demonstrably consistent with achieving the outcomes expressed by MSC Principles 1 and 2. These short-term objectives are well defined and measurable, in the sense that performance against them can be measured through the enforcement bodies' recording and inspection routines (see 3.2.3). Well defined and measurable long-term objectives consistent with achieving the outcomes of MSC Principle 1 are explicit within the fishery's management system, reflected in the management plan's ambition to maintain fishery at a level consistent with defined biological reference levels. However, less well defined and measurable objectives exist for Principle 2, warranting a partial score on the SG100.		
References		Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) Agreement on the Long-term Management of the North Sea and Skagerrak Herring Stocks Report to the Storting No. 37 (2008–2009) Integrated Management of the Marine Environment in the Norwegian Sea (management plan)		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.2.2

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	Established decision-making procedures at national level in Norway – evolved over several decades and now codified in the 2008 Marine Resources Act – ensure that strategies are produced and measures taken to achieve the fishery-specific objectives. The Ministry of Fisheries and Coastal Affairs decides on policy and regulatory schemes, while the Directorate of Fisheries acts as a technical body with a main responsibility for secondary legislation. The Directorate and the Coast Guard perform compliance control, on shore and at sea respectively. The decision-making processes include the allocation of national quotas to fleet groups according to an elaborate distributional scheme based on vessel groups defined by gear and length of the vessels. Further, technical regulations are defined by the Directorate of Fisheries, after consultations with user-groups and other stakeholders, as well as with other nations for shared stocks. The enforcement system is further described in 3.2.3. At the international level, management plans are produced and reviewed and TAC agreed and shared between the EU and Norway, according to an agreement on cooperation on fisheries management from 1998, revised in 2004 and 2008. The established decision-making processes have resulted in measures that contribute to achieving the objectives of the management plan.		
b	**Guidepost**	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues 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 respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	Y

PI 3.2.2		**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**		
	Justification	According to our interviews during the site visit, the established decision-making procedures at national level in Norway respond to all issues identified in research, monitoring, evaluation or by groups with an interest in the fishery. This is ensured through the arenas for regular consultations between governmental agencies and the public, first and foremost the Regulatory Meetings, further through ad hoc consultation with the industry and other stakeholders. In addition, there is close contact between authorities and scientific research institutions, primarily between the Directorate of Fisheries and the Institute of Marine Research. Both scientists and user-group representatives claim that the relevant government agencies are open to any kind of input at any time. They feel that the authorities' response is transparent and timely and that the ensuing policy options take adequate account of their advice. From the authorities' point of view, these consultations contribute to enhanced quality of decision-making and also to the legitimacy of the regulations. At the international level, the management system also responds to issues raised on the basis of knowledge from science, review and evaluation, through the EU–Norway and RAC frameworks.		
c	**Guidepost**		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	Decision-making processes are based on relevant ICES assessments and the management plan that has been assessed by ICES and confirmed to be consistent with the precautionary principle.		
d	**Guidepost**	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	N

MSC FISHERY ASSESSMENT REPORT

PI 3.2.2		**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**		
	Justification	The Ministry of Fisheries and Coastal Affairs submits annual reports to the Parliament on behalf of the entire system for fisheries management. Other involved agencies, such as the Institute of Marine Research, the Directorate of Fisheries and the Coast Guard, produce annual reports that are available to the public on request. In these reports, actions taken or not taken by the relevant authority are accounted for, including those proposed on the basis of information from research, monitoring, evaluation and review activity. However, no formal reporting to all interested stakeholders takes place.		
e	**Guidepost**	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.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	Y
	Justification	The management authority is not subject to continuing court challenges. When occasionally taken to court by fishing companies, the management authority complies with the judicial decision in a timely manner. There are, for instance, recent examples of authorities losing court cases and immediately accepting the verdict. However, the management authority works proactively to avoid legal disputes. This is done partly through the tight cooperation with user-groups at the regulatory level, ensuring as high legitimacy as possible for regulations and other management decisions. Regulatory and enforcement authorities offer advice to the fleet on how to avoid infringements, on request but often on their own initiative. For example, Coast Guard inspectors work in a dedicated manner to communicate with fishers on the fishing grounds, keeping them updated on changes in regulations and explaining the rationale of the rules in an attempt to increase their legitimacy. In 2012, the enforcement agencies were given the authority to issue administrative penalties for minor infringements (serious enough to be met by a reaction above a written warning though; see 3.2.3), thus referring only the most serious cases to prosecution by the police and possible transfer to the court system.		
References		Agreement between EU and Norway on the Management of Fish Stocks in the North Sea and Skagerrak, 1998 Interviews with representatives of the Ministry of Fisheries and Coastal Affairs, Directorate of Fisheries, the Norwegian Fishermen's Association and the Fishermen's Sales Organization for Pelagic Fish during site visit		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**

MSC FISHERY ASSESSMENT REPORT

PI 3.2.2	**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**
CONDITION NUMBER (if relevant):	

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.2.3

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive 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.
	Met?	Y	Y	Y

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**		
	Justification	Monitoring, control and surveillance is taken care of thorough shared responsibility and close collaboration between the Directorate of Fisheries, the Coast Guard and the regional sales organizations. The Directorate of Fisheries keeps track of how much fish is taken of the quotas of different vessels, vessel groups or other states at any given time, based on reports from the fishing fleet. Norwegian vessels are required to have electronic logbooks, where real-time catch data are forwarded to the Directorate of Fisheries. The self-reported catch data can be checked at sales operations through the sales organizations, which have monopoly on first-hand sale of fish in Norway, and through physical checks performed by the sales organizations, the Directorate of Fisheries and the Coast Guard. The sales organizations are required to record all landings of fish in Norway and keep track of how much remains of a vessel's quota at any given time, on the basis of the landings data. This information is compared to the figures provided by the vessels to the Directorate of Fisheries through the electronic logbook. The value of any catch delivered above a vessel's quota is retained by the sales organization and used for control purposes. The sales organizations have their own inspectors who carry out physical controls of landings. For instance, the Fishermen's Sales Organization for Pelagic Fish has five inspectors scattered along the Norwegian coastline. The Directorate has seven regional offices along the coast, staffed with inspectors that carry out independent physical control of the fish at the point of landing, including total volume, species and fish size. The landed volumes are then compared to the volumes reported to the Directorate through the logbooks. The Coast Guard is administratively part of the Norwegian Navy but performs tasks on behalf of several ministries, including the Ministry of Fisheries and Coastal Affairs. Its most important field of work, in practice, is fishery inspections. Coast Guard inspectors board fishing vessels and control the catch (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds. Using the established conversion factors for the relevant fish product, the inspectors calculated the volume of the fish in round weight and compare this with the catches reported to the Directorate through the logbooks. Hence there are a number of possibilities for enforcement authorities to physically check whether the data provided by fishers through self-reporting are indeed correct. In addition, VMS data enables control of whether area restrictions are observed, among other things. A study of the implementation by the world's fishery nations of the FAO Code of Conduct for Responsible Fisheries gives Norway a top score on the monitoring, control and surveillance indicator.		
b	**Guidepost**	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	Y

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**		
	Justification	The Norwegian enforcement agencies use a graded sanctioning system, with sanctions ranging from oral warnings, written warnings and administrative fines to formal prosecution. If the fishers do not accept the fines issued by the enforcement or prosecution authority, the case goes to court. The decision of a lower-level court can then be appealed to higher-level courts. The Coast Guard carried out 1713 at-sea inspections in 2012. In the vast majority of these inspections, no infringements were discovered. 40 inspections (2 %) resulted in a fine or prosecution. The share of infringements relative to the total number of inspections has remained at this level in recent years. In the Directorate of Fisheries' inspections of vessels engaged in the fishing for Norwegian spring-spawning herring in 2012 (141 inspections), no fines were issued and only 3 warnings (2 % of inspections). (No figures are provided in the annual report of inspections of vessels engaged in the fishery of North Sea and Skagerrak herring.) The Fishermen's Sales Organization for Pelagic Fish carried out 625 physical inspections in 2012, during which 9 infringements (1 % of inspections) were revealed. The comprehensive enforcement system combined with the high level of compliance makes it reasonable to assume that the system provides effective deterrence.		
c	**Guidepost**	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	Y

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**		
	Justification	As noted under SI 3.2.3 b) above, inspection statistics indicate that the level of compliance in Norwegian fisheries is high. There is a high degree of confidence that this is indeed so, given the many opportunities to cross-check information between the different enforcement authorities. Taking together the high compliance level and the comprehensiveness of the enforcement system, it is reasonable to conclude that the system provides for effective deterrence. In addition, there is evidence that other factors contribute to the high compliance levels in Norwegian fisheries: - the legitimacy of regulations - the close contact between enforcement bodies/inspectors and the fishing fleet - the general respect for the law in Norway Sociological investigations indicate that the close collaboration between user-groups and management authorities has ensured regulations a high degree of legitimacy among Norwegian fishers. Adding to this, relations with the Coast Guard inspectors are generally reported by fishers to be very good. Inspectors spend considerable time on board fishing vessels explaining the rationale behind different regulations and advising fishers on how to avoid unintentional infringements. At the same time, Coast Guard inspectors do not adopt a top-down attitude towards the fishers but actively seek their views on the situation, which creates a mutual respect between the two groups. Finally, investigations indicate that the trust in the management system and more widely the general respect for the law is high in Norway, contributing to a high degree of compliance in fisheries, as in other sectors of society.		
d	**Guidepost**		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	As demonstrated in SI 3.2.3 b) and c) above, the level of compliance in Norwegian fisheries is generally high. Interviews during the site visit indicate that among the relatively few cases of detected infringements, there is no evidence of systematic non-compliance.		
References		Annual Report of the Coast Guard 2012 Gezelius, Stig S. (2002), 'Do norms count? State regulation and compliance in a Norwegian fishing community', Acta Sociologica, 45, 305–314. Hønneland, Geir (2000/2013), Coercive and Discursive Compliance Mechanisms in the Management of Natural Resources: The Case of the Barents Sea Fisheries, Dordrecht: Springer Hønneland, Geir (2012), Making Fishery Agreements Work: Post-Agreement Bargaining in the Barents Sea, Cheltenham: Edward Elgar Inspection records of the Directorate of Fisheries 2010–2012 Interviews with representatives of the Ministry of Fisheries and Coastal Affairs, Directorate of Fisheries, the Norwegian Fishermen's Association and the		

MSC FISHERY ASSESSMENT REPORT

PI 3.2.3	**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**	
	Fishermen's Sales Organization for Pelagic Fish during site visit Jentoft & McCay: Jentoft, Svein and Bonnie J. McCay (1995), 'User participation in fisheries management', Marine Policy, 19, 227–246. Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) (2006), Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries, Fisheries Centre Research Report Vol. 14 No. 2, Vancouver: University of British Columbia	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	Norway has a research plan embodied in the objectives of the Marine Resource Act, the integrated management plans for the Barents Sea, the Norwegian Sea, the North Sea and Skagerrak, as well as in the statutory documents of the Institute of Marine Research. CRISP and MAREANO are more dedicated research plans. A coherent and strategic approach to research across all three MSC principles is primarily found in the integrated management plans, where economic and social viability are emphasized along with precautionary and ecosystem-based resource management. The various national plans feed into plans affecting the North East Atlantic at the international level, primarily in the ICES and OSPAR research and management systems, as well as the North Sea Conferences. Further at the international level research plans exist in the Coastal State management plans. The primary objective of the research plans is to ensure scientific data necessary to conduct fisheries management according to the precautionary and ecosystem approaches. The various research plans are peer reviewed (e.g. by ICES) and the integrated management plan subject to regular revisions and update. Hence the information covered in these documents can be considered to be reliable and timely, and adequate to achieve the objectives consistent with the MSC principles.		
b	**Guidepost**	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	Y
	Justification	Research plans and results are published on websites, e.g. on the websites of ICES and the Institute of Marine Research, as publicly available research reports and as journal articles. They are also actively disseminated to all interested parties, primarily through emailing lists.		
References		Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) Agreement on the Long-term Management of the North Sea and Skagerrak Herring Stocks		

MSC FISHERY ASSESSMENT REPORT

PI 3.2.4	**The fishery has a research plan that addresses the information needs of management**	
	Report to the Storting No. 37 (2012–2013) Integrated Management of the Marine Environment in the North Sea and Skagerrak (Management Plan)	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

MSC FISHERY ASSESSMENT REPORT

Evaluation Table for PI 3.2.5

PI 3.2.5		There is a system of 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		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	Y
	Justification	All parts of the management system are subject to evaluation. The Norwegian management system at large is reviewed by the Parliament upon submission by the Government (through the Ministry of Fisheries and Coastal Affairs) of annual reports on the state of affairs in Norwegian fisheries management. At the Regulatory Meetings that take place twice a year management authorities received feedback on management practices from the industry and other interested stakeholders, including NGOs. The scientific research component of the fisheries management system is regularly reviewed in ICES reports and advice. The enforcement component is subject to continuous evaluation at meetings between the various bodies involved in enforcement activities, where priorities are hammered out on the basis of risk-based monitoring of past experience.		
b	**Guidepost**	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	Y
	Justification	The fishery-specific management system is subject to internal review at regular internal self-evaluation meeting within the Norwegian bodies of governance. It is also subject to a number of mechanisms for regular external review. It is annually reviewed by Parliament following the submission of status reports by the Ministry of Fisheries and Coastal Affairs, and by the industry and other interested stakeholders at the Regulatory Meetings (see 3.2.5 b)). The Auditor General conducted comprehensive evaluations of the entire Norwegian system for fisheries management in 2003–2004 and in 2007–2008 – a new one is currently underway. In addition, Norwegian authorities present information on the national system for fisheries management for review by a number of international organizations at regular intervals, e.g. to the FAO Committee of Fisheries, the UN Resolution on Sustainable Fisheries and the OECD. The international fishery-specific management system is evaluated through regular internal and external reviews of management plans.		
References		Auditor General's Report No. 3:13 (2003–2004) on the Management of the Fish Resources Auditor General's Report No. 3:2 (2007–2008) on the Management and Enforcement of the Fish Resources of the Barents Sea and the Norwegian Sea		

MSC FISHERY ASSESSMENT REPORT

PI 3.2.5	**There is a system of 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**	
	Interviews with representatives of the Ministry of Fisheries and Coastal Affairs and the Directorate of Fisheries during site visit Report to the Storting No. 40 (2012–2013) On the Fishery Agreements that Norway has Concluded with Other States for 2013 and Fishery According to the Agreements in 2011 and 2012	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

Appendix 2. Peer Review Reports

The report includes the unattributed reports of the peer reviewers in full using the 'MSC peer review template' available on the MSC website forms and templates page (http://www.msc.org/documents/scheme-documents/forms-and-templates) and responses of the assessment team (*blue text, italic*).

Peer reviewer 1

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**Conformity Assessment Body Response**
Justification: I have examined the report and the evaluation table in detail and made appropriate comments below. I concur with all but a small number of the scores which, if amended as suggested, will not significantly affect the overall scores and the recommendation to certify this fishery.		

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**Yes/No**	**Conformity Assessment Body Response**
Justification: No conditions raised.		

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**Yes/No**	**Conformity Assessment Body Response**
Justification: ***NA.***		

General Comments on the Assessment Report (optional)

My review is based on a reading of the Peer Review Report. I have made no attempt to access or peruse the extensive list of publications cited by the assessment team.

This is a very competent and comprehensive assessment of the Norway North Sea & Skagerrak Herring Fishery against the MSC Principles and Criteria for Sustainable Fisheries. The Report is well presented and provides an authoritative overview of the fishery and the issues that relate to the three MSC Principles. I was particularly impressed with the large number of references quoted, and consequently the high standard of detail throughout the report. I concur with the majority of comments and scoring in the Report. Any modifications to the scoring as a result of my review will not affect the overall conclusion to certify this fishery, which I fully support.

Report issues and concerns and major text edits requiring attention.

[The issues and concerns are high-lighted and numbered (Comment DBxx) in a digital copy to help the assessors locate the relevant places in the Report. A digital copy has been sent to Det Norske Veritas AS, together with some minor edits not listed here.]

1. Herring landings nearly doubled in 2012 (Figure 2). This was the result of an increase in the TAC from 200,000t in 2011 to 405,000t in 2012 (Table 2). There needs to be an explanation for this increase, as recommended by ICES. It seems to be at variance with the stock trends, in particular, the relatively low recruitment in recent years (Figure 11). Was this increase a result of the change in assessment model in 2012, and the change in the perception of the spawning stock biomass (SSB) in 2012 and 2013 (Figure 6)? Some further explanation is required. (Comments DB9, DB10, & DB27)

   I am confused as to how this >15% increase in the 2012 TAC was permitted when any revision of the management plan had not been made and the 2008 MP is in use with its 15% TAC rule (see 3.3.3.2 and 3.3.3.6) An explanation is required. (Comments DB27, DB29 & DB34)

   This was an issue of great concern to CABs and was addressed by a harmonised Condition at the subsequent surveillance audits. The TAC for 2012 was agreed at the EU/Norway management meeting which deals with the management of this shared stock. The increase was related to the changed perception of SSB with the new model used in 2012 for the assessment of stock status in 2011. That changed perception resulted in average increases of 31% in the SSB with the highest value of 54% in 2010. This is all clearly explained in the report at section 3.3.2.2 and in Figure 6.
   The eventual agreed TAC for 2012 was based on the EU/Norway Harvest control rules implemented within the management plan but ignoring the 15% +/- TAC annual change. This could have resulted in a TAC of 478,000t against the management plan level of 230,000t.

2. It is not made clear why the B_{pa} was revised down in 2013, but B_{lim} remained the same. (Comments DB20 & DB25)

   It is clearly explained and referenced in section 3.3.3.2, of the report, on the future of the long term management plan. This section explains that it was recognised that the reference points needed to be re-visited in the light of the changed perception of the stock. As a result ICES convened a Workshop, WKHELP, in 2012 to re-evaluate the reference points. The workshop concluded that the biomass limit level should remain the same but that the biomass precautionary level should be revised downwards.

3. There is a need to explain how SSBmp and Fmp relate to other reference points, and avoid the confusion (at least for me) arising. (Comments DB20, DB22, DB23 & DB28)

   All the reference points are fully explained in the Table and text in section 3.3.3.3 and are implicit in the details of the Management Plan in section 3.3.3.1

4. The fact that there is little explanation for the recent poor recruitment, despite the higher SSB since 2008 (Figure 6) and the change in the perception of SSB to well above B_{pa} and B_{lim} since 2007 (Figure 6), must raise concerns about the future sustainability of the North Sea herring stock. (Comments DB19 & DB26)

   Inevitably there are concerns about the unexplained sequence of below average recruitment. However the stock is being managed relative to this issue and ICES currently considers the fishing mortality to be appropriate and below the management plan level for adults and juveniles. In terms of the SSB it is currently well above the precautionary level above the management plan level and is considered to have full reproductive capacity.

5. Haddock eat herring eggs (See 3.4.2.1.9). Do any other species eat herring eggs, and could predator population increases account for the recent reduction in herring recruitment? (Comment DB46)

   Appropirate comment is added to text

6. Herring spawning grounds are susceptible to bottom trawling, sand and gravel dredging, and seismic surveying (see 3.3.1). Is there any evidence that scallop dredging has had a detrimental impact on spawning grounds? (Comments DB11, DB33, & DB39)

   The team has neither found nor been presented with any evidence regarding potential detrimental effect on herring spawning grounds from scallop dredging. From our own experiences we believe it likely that scallop fishing areas do not coincide with any of the known herring spawning areas.

7. Has anyone correlated % maturity at age with year class strength or SSB (with time lags) to show if there is a significant statistical relationship (see 3.3.1.3)? If so, quote it. (Comment DB14)

   As far as the assessment team is am aware this has not been done and it is not the role of an assessment team to carry out further investigations of this nature.

8. Figure 5 – SSB / recruitment relationship. Is there a statistically significant relationship? (Comment DB18)

   Yes this is one of the best Stock and recruitment relationships anywhere, mainly because of the very low SSBs in the 1970s. It supports the establishment of a firm biomass limit level of 800,000t which has been an important, fundamental trigger point in the management of the stock since its collapse in the 1970s. Further details can be found in the stock annexes to the ICES assessment working group reports.

9. Quote: “The ‘0’ and ‘1’ winter ring fish comprised 32% of the total catch in numbers in 2012. Most of these are taken by the ‘B’ fleet in Division IVb where they comprised 57% of the total catch. Some are also taken in the mixed clupeoid fishery, ‘D’ fleet in Division IIIa.” (See 3.3.2.2, text after Figure 9, and Figure 10.) Quote: “The age of first maturity in the North Sea is 3 years old (2 winter ringers, wrs)”.

Is this not a worryingly heavy exploitation of juvenile herring? With 32% (57% in IVb) of the catch by numbers, this is a lot of juvenile herring! Why is this poor exploitation pattern permitted? It appears to be mainly in the small meshed fisheries (<32mm mesh), presumably in the sprat and sandeel fisheries. How do these catch numbers square with the quite low Fmp juv 0.05 target and the 2012 estimate of Fjuv=0.035? What effect is this having on recruitment to mature age classes and SSB? Have you taken sufficient account of this juvenile mortality in assessing sustainability with the current below average recruitment? Is there not a lesson to be learnt from the collapse in the last century of the Norway Spring Spawning Herring fishery due to high fishing mortality on juvenile herring?(Comment DB24)

The regulations introduced in the late 1990s to reduce the fishing mortality on young herring in by catch fisheries and the targeted sprat fisheries and to ban small meshed fisheries targeting herring has been one of the success stories in relation to North Sea herring management. Details of these historical management issues related to curbing juvenile fishing mortality can be found in Nichols 2001 referenced in the report.
Yes it would be good to eliminate juvenile catches altogether but that is a practical impossibility. Although the numbers of fish are high the actual juvenile F is very low and considered to under very strict enforcement control.

10. If the fleet definitions given after Table 8 also apply to Table 2 they need to be inserted after Table 2 to explain the various fleets. (Comment DB32)

    Addressed in the comments on the text of the report

11. Is there any evidence that the discard ban in Norway led to a significant reduction in the food supply for birds and consequential reductions in some bird populations? Are there any predictions of the impact of the EU discard ban when implemented? (See 3.4.1.7) (Comment DB41)

    The assessment team is not aware that this has been looked at specifically and it as not been raised hitherto by any of the NGOs.

12. Table 11. Should MR and R appear somewhere in the table? See also 3.4.2.1.2-12 where these definitions are used, but not identifiable in this table. (Comment DB45)

    Text is amended.

13. Tables 19 & 20. The species listed here as “retained species” or “bycatch” are not the same as those given above in section 3.4.2.1 *et seq*. (Comments DB47 & DB48)

    Text is amended

14. 4.1 Harmonised Fishery Assessment. In this section the various scoring comments from other fisheries are presented, but there is very little direct comparison made that justifies the different scoring. Draw attention to the specific differences with a comment that justifies the NNS&SH scores. (Comment DB50)

The main example PI 1.2.2. SPSG(75) has a note (italics) that justifies the Norway North Sea & Skagerrak herring score of 80, rather than the lower <80 scores for the other assessments. A paragraph making direct comparisons across all the given harmonisation fisheries would have made a stronger case for the NNS&SH score. (Comment DB51)

PI 2.5.2 & PI 3.1.4. The same comments apply. (Comment DB52).

Text is amended

15. Table 26. There is no explanation as to why this table appears, and what significance it has. (Comment DB59)

    Information provided in table 26 is a mandatory part of the report template. An introduction text is provided in the section above the table.

16. 6.2 Summary of Scores – Text Table titled Fishery Assessment Scoring Worksheet……. The scores (highlighted in green) are correct when compared to the table in Appendix 12, but there seems to be a spurious score of 79.6 against "PI Stock rebuilding PI scored".

    As stock rebuilding PI is not scored, the applicable overall weighted score for P1 is 96.3.

17. Evaluation Tables, e.g. PI 1.1.2. For PI 1.1.2 an overall score of 100 is given, despite a score for 1.1.2.a of only 80, as there was no 100 scoring guidepost available. I do find this latest system with missing guideposts rather strange! Someone has pre-judged the possible score. (Comments DB60, DB61, DB64 & DB65) Maybe more use should have been made of P (Partial) scores. (Comment DB76)

    Scoring of PI 1.1.2 is in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative", and as all 60, 80 and 100 issues are met the overall score should be 100.

18. What is 1.2.1.e shark finning doing here? I assume it is "standard" but incongruous procedure. (Comment DB62)

    If the target species is a shark, the team shall score scoring issue (e) to ensure that shark finning is not being undertaken in the fishery. Not relevant for this fishery.

19. Evaluation Table. PI 1.2.2.b. Should the uncertainty over the reasons for the current poor recruitment be listed here? (Comment DB63)

    The assessment team has already addressed this point in the report. This is not a harvest control rules and tools issue.

20. Evaluation Table PI 2.1.1. How do scores of 80/100/NA/60 come to an overall score of 90? Is 2.1.1.b heavily weighted? (Comment DB65)

PI 2.1.2 seems to have a, b, c, and d equally weighted to give a score of 90. (Comment DB67)

Scoring of PI 2.1.1 and PI 2.1.2 are in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative". 27.10.5.3: All SG80 scoring issues are met, and as 50% of the SG100 scoring issues are met an overall score of 90 is appropriate.

21. Evaluation Table PI 2.1.3.d. Guidepost 100 says "Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.", but what about the poor knowledge of mortalities in WBSSH? Rather than a "Y" for the "Met" at 100, a P (Partial) score would be more appropriate. Re-assess the 2.1.3 overall score and modify scoring summary tables (6.2 & Appendix 12) as necessary, where ever scores are changed. (Comments DB68-70)

    Text has been amended to justify SG 100 score.

22. Evaluation Table PI 2.2.1. If a=100, b=80, and c=60, then overall score = 80, not 100. (Comment DB72)

    Scoring of PI 2.2.1 is in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative", and as all 60, 80 and 100 issues are met the overall score should be 100.

23. Evaluation Table PI 2.3.1.a. Quote: "The absence of such evidence supports the industry's contention……". Cannot the reference-fleet observers provide definitive negative evidence re birds? The absence of evidence is hardly reassuring. (Comment DB74)

    Text is amended.

24. Evaluation Table PI 2.4.3.b. Score should be P (Partial) at 100, bearing in mind impacts have not actually been quantified – only concluded by inference. (Comment DB77)

    Text has been amended to justify a 2.4.3 b SG 100 "N" for purse seine and "Y" for pelagic trawl.

25. Evaluation Table PI 2.5.3c. A P score as "Not all aspects….." Overall score reduced. (Comments DB79 & DB80)

    Text has been amended to justify SG 100 score.

26. Evaluation Table PI 2 – Pelagic Trawl. I could only find a few minor differences (unless I missed something significant) compared to the PI 2 Purse Seine table. The scores are identical (see 6.2 Summary of Scores in Report). The only differences were in 2.1.1.a where pelagic trawl had some text differences, and 2.4.1.a with small text changes. I see no need to repeat all the PI scorings for Pelagic Trawl. PI 1 and 3 were Purse Seine and Pelagic Trawl combined. Combine PI 2, which would only require a few small text changes in 2.1.1 and 2.4.1, and delete the separate Pelagic Trawl table.

According to instructions in the MSC Full Assessment reporting template v1.3, for reports covering multiple units of certification where there are multiple gear types and one target species, multiple tables might be appropriate for Principle 2 to account for the different gear types. Even if there are small differences for the two gear types, the assessment team prefers to keep these separate.

27. Evaluation Table P3 3.2.3.d scores 80, therefore overall score <100. (Comment DB94)

Scoring of PI 3.2.3 is in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative", and as all 60, 80 and 100 issues are met the overall score should be 100.

28. I have marked the Performance Indicator Review Table for P2 for Purse Seine and Pelagic Trawl combined (as in 6.2 Summary of Scores in Report).

The assessment team chooses to keep PI scoring tables separated per gear for P2.

MSC FISHERY ASSESSMENT REPORT

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
Example:1.1.2	*No*	*No*	*NA*	*The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks for a target reference point that is consistent with maintaining the stock at Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.*	
1.1.1	Yes	Yes	NA	The PI comments given support this score	
1.1.2	Yes	No	NA	1.1.2.a scored 80, therefore overall score should be <100	Scoring of PI 1.1.2 is in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative", and as all 60, 80 and 100 issues are met the overall score should be 100.
1.1.3	NA	NA	NA		

MSC FISHERY ASSESSMENT REPORT

DNV·GL

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.1	Yes	Yes	NA	The PI comments given support this score	
1.2.2	Yes	Yes	NA	The PI comments given support this score	
1.2.3	Yes	Yes	NA	The PI comments given support this score	
1.2.4	Yes	Yes	NA	The PI comments given support this score	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Yes	No	NA	How do scores of 80/100/NA/60 come to an overall score of 90? Is 2.1.1.b heavily weighted? Re-assess overall score.	Scoring of PI 2.1.1 is in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative". 27.10.5.3: All SG80 scoring issues are met, and as 50% of the SG100 scoring issues are met an overall score of 90 is appropriate.
2.1.2	Yes	Yes	NA	The PI comments given support this score	
2.1.3	Yes	No	NA	2.1.3.d guidepost 100 says "Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.", but what about the poor knowledge of mortalities in WBSSH? Rather than a "Y" for the "Met" at 100, a P (Partial) score would be more appropriate. Re-assess overall score.	See text above

MSC FISHERY ASSESSMENT REPORT

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.1	Yes	No	NA	If a=100, b=80, and c=60, then overall score = 80, not 100	Scoring of PI 2.2.1 is in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative", and as all 60, 80 and 100 issues are met the overall score should be 100.
2.2.2	Yes	Yes	NA	The PI comments given support this score	
2.2.3	Yes	Yes	NA	The PI comments given support this score	
2.3.1	Yes	Yes	NA	The PI comments given support this score	
2.3.2	Yes	Yes	NA	The PI comments given support this score	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	Yes	Yes	NA	The PI comments given support this score	
2.4.1	Yes	Yes	NA	The PI comments given support this score	
2.4.2	Yes	Yes	NA	The PI comments given support this score	
2.4.3	Yes	Yes (but see justification)	NA	2.4.3.b. Score should be P (Partial) at 100, bearing in mind impacts have not actually been quantified – only concluded by inference.	See text above
2.5.1	Yes	Yes	NA	The PI comments given support this score	
2.5.2	Yes	Yes	NA	The PI comments given support this score	

MSC FISHERY ASSESSMENT REPORT

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.3	Yes	No	NA	2.5.3.c should be a P score as "Not all aspects….." Re-assess overall score.	See text above
3.1.1	Yes	Yes	NA	The PI comments given support this score	
3.1.2	Yes	Yes	NA	The PI comments given support this score	
3.1.3	Yes	Yes	NA	The PI comments given support this score	
3.1.4	Yes	Yes	NA	The PI comments given support this score	
3.2.1	Yes	Yes	NA	The PI comments given support this score	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes	Yes	NA	The PI comments given support this score	
3.2.3	Yes	No	NA	3.2.3.d scores 80, therefore overall score <100.	Scoring of PI 3.2.3 is in accordance with MSC CR v1.3 27.10; scoring is regarded as "cumulative", and as all 60, 80 and 100 issues are met the overall score should be 100.
3.2.4	Yes	Yes	NA	The PI comments given support this score	
3.2.5	Yes	Yes	NA	The PI comments given support this score	

MSC FISHERY ASSESSMENT REPORT

Comments	Conformity Assessment Body Response
A very competent report. My extensive list (1 to 28) of issues and the scoring queries in the Performance Indicator Review are in essence quite minor. I endorse certification of this fishery.	

Peer reviewer 2

General Comments on the Assessment Report (optional)

The assessment is generally inclusive, satisfactorily structured and applies the MSC FAM rather strictly. The application of the scoring guidelines and justification is comprehensive although I have several queries on the scoring. There are also minor editing issues, which should be corrected and which I have listed separately. With regard to the preface to the assessment and information provided, the description of the fishery related to each MSC Principle is generally informative and adequate for the purposes of this review although some statement are not supported by facts or are erroneously reported and thus need to be edited accordingly. Throughout, I have identified the section(s) of the report at which my comments are aimed, and have not commented where I am content with the information provided or the conclusions reached.

Page 44: the following sentence is only partially supported by data and it should be edited accordingly: "*Large annual variations in species composition **might** occur as a consequence of natural fluctuations in recruitment ~~success~~ of the individual species **and because of the effect of the fisheries exploitation***".

Text is amended.

Page 44: the following sentence is not supported by data and it should be edited accordingly: "*Absolute numbers of small fish belonging to all species and of demersal species with a low maximum length have steadily and significantly increased over large parts of the area during the last 30 years, while the abundance of large fish has decreased. The most plausible explanation for this is the reduction of the predation pressure on juvenile fish and on species that remain small. This is as an indirect effect of overexploitation of the large predatory (demersal) fish species*".

I suggest to eliminate the last paragraph or to include the reference from which the statement is derived. Another solution would be to add more explanations to the current text as for example that change in size structure of the fish community is due to variation in growth rate, climate or density-dependent effects, interspecies trophic interactions, etc.

Reference is cited.

Page 45: the following sentence is not supported by recent assessment and it should be edited accordingly: "*Recently, species like hake Merluccius merluccius and pollock Pollachius pollachius are decreasing in the Skagerrak and Kattegat*".

Northern hake, which also includes North Sea, Skagerrak and Kattegat, is estimated to be at its all time high level in 2012, while no assessment is available for *Pollachius pollachius. Also, Pollachius pollachius in English is pollack and not pollock (Pollachius virens) as stated in the report*.

Text is amended.

Page 45: the following sentence should be edited accordingly: "*Local breeding success of some species has been low in some recent years, possibly due to a local shortage of forage fish **or other causes***". **I also suggest including the reference from which the statement is derived.**

The assessment team has not included any reference on this as the comment is clearly speculative.

Page 47: Table 11 should also contain a column with the % of each bycatch species and gear compared to the total TAC of that species and to the total catch of the fleet.

The assessment team does not find such an additional column necessary as it is clear that with the exception of blue whiting & saithe, catches of non-target species are trivial.

Page 47: The MSC threshold criterion for being termed main retained species is >5% the total catch of all species and/or if the species are considered vulnerable. The species in Table 19 are landed in very small quantity and also cannot be considered vulnerable. However, the table is confusing at it mentions MR, main retained species, and R, other retained species, in the table caption but then it does not report which is actually an MR and which is an R species.

Correction is made.

Page 57: Table 19 should also include a column with the total weight of the fish caught and not only the numbers.

The original paper from which these data are taken does not include weights. If one divides the number of fish recorded by the number of positive samples, one can see that the numbers per haul are truly trivial and even for a larger and numerous fish such as greater argentine the total weight recorded would be small (<1 t).

Page 78: In Table 29, by catch species are defined as non main retained species while in the introductory text at page 47 these are defined as “main retained species”, which is clearly inconsistent and also incorrect.

Introductory text to table 19 is amended.

Scoring

General issues
The major concern I have is with the way the text under justification is linked to the reference list under each guidepost evaluation. There are generally several references, which are in most of the case pertinent to the scoring. However, they are not cited in the justification text, which makes impossible for the reader to evaluate each of the statement used for justifying the scoring. I suggest that all references listed in the reference list under each of the Evaluation Table are also cited in the justification text.

The accepted practice for these reports is to put the references relating to the scoring comments in the reference box which is an integral part of the standard sheet format. All the information in the scoring comments is well documented in the text of the report and referenced there in the normal way.

PI 1.2.2b,c: I disagree with the scoring here. Catches of WBH in the North Sea and Skagerrak are taken into account in the assessment and thus used to estimate F. Moreover, the EU DCF does cover WBH in a satisfactory way. Thus, the design of the harvest control rules takes into account a wide range of uncertainties and it should have scored **yes** here.

The current harvest control rules for WBH are based on ICES the MSY framework and thus they are delivering the overarching objective of the CFP, i.e. MSY, also considering the fast that the TAC has been recently set in line with the scientific advice. According to the ICES short term forecast, the stock is estimated to be in 2014 above B_{lim}, with F below F_{msy}. Thus, the tools in use are effective in achieving the exploitation levels required under the current harvest control rules. I might tend to agree that a forecast cannot be accounted as "clearly show" in the strict sense but then, for example, all ecosystem modeling, which are based on simulations, would be discarded for evaluating P2. I therefore think that **PI 1.2.2** should have at least scored 95 and not 80.

The scoring comments do clearly support a failure to meet either of the rigorous requirements of SG100. There has been a long history of major problems in relation to the rules and tools which control this fishery, problems of misreporting, under reporting, slippage and discarding. These have all resulted in Conditions on the certifications in the past. Although most of these have been addressed through rigorous enforcement measures it would be premature to conclude, at this early stage, that everything is now totally satisfactory. We feel that the score of 80 is right at this time and suitably flags up an issue which needs to be monitored very carefully.

PI 1.2.3b,c: See explanation above. Moreover, the rationale of using WBH for scoring 90 is flawed as the level of uncertainty in stock assessment of this stock is not much dissimilar to that estimated for NSH.

See explanation above. It is the same issue and the same rationale for the score applies, The fishery clearly fails to meet the rigorous requirements at SG 100 scoring issue b where 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 inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
The high degree of certainty requires a probability of 95% at Principle 1 and the team are of the firm opinion that the fishery does not meet the requirements of this scoring issue at that level of certainty. Scoring issue c only has to meet SG 80 and scoring issue a meets 100. Therefore according the scoring protocol MSC CR v1.3: 27.10, this PI scores 90.

PI 2.1.1b: See explanation at **PI 1.2.2** and **PI 1.2.3**. The strategy in place works, based on information directly about the fishery and/or species involved, as the WBH stock is estimated to be in 2014 above B_{lim}, with F below F_{msy}. Thus the score should have been at least 95 here.

The assessment team accepts the point made, but chooses to maintain a score of 90.

PI 2.1.3: It is not possible to distinguish between NSH and WBH herring if not with rather complicated otolith analysis technique, thus part of the justification text is not relevant. Anyhow, the evaluator is also contradicting himself: First it is written: *"The post hoc biological sampling and analysis upon which estimates of WBSSH catches are based is sufficient to estimate outcome status with respect to biologically based limits but not with a high degree of confidence"* and then again: "*The total herring catch data and the post hoc biological sampling and analysis that provides the estimate of WBSSH catches in the NS&SH fishery are adequate to support a strategy to manage retained species, and evaluate whether the strategy is achieving its objective but it is too early to say with a high degree of certainty that the strategy is meeting its objectives*". This is not correct as the uncertainty in the assessment (which encapsulates all sources of uncertainty) is small for

WBH as shown by the 95% CI of the SAM models results. Also, as WBH is estimated to be above B_{lim}, with F below F_{msy} in 2014, the information is clearly adequate. Again, the rationale of not scoring 100 is flawed.

The status of the WBSS stock in 2013 is not yet in the public domain and will not be availalable until after the ICES assessment WG report is published, together with the ICES advice, in May 2014. The situation with Western Baltic Spring spawners at the time of the site visit and scoring meeting is not as the Peer reviewer claims in his last paragraph. The ICES advice, May 2013, clearly states that the fishing mortality in 2012 was above MSY target, SSB was below MSY B trigger and close to Blim and that the stock was at increased risk in terms of the precautionary approach to Bpa and Blim. Recruitment remains well below the long term mean. Furthermore there are no specific management objectives currently in place for this stock. We rest our case for the score of 85 for this PI.

P 2.3.3: The justification for not scoring 100 here is rather ambiguous. In the introductory text is stated: "*The observers collect information on the quantities of all fish species caught plus records of the numbers of birds and marine mammals caught. Such data are collected by observers aboard Norwegian reference-fleet vessels, which include both pelagic trawlers and purse seiners (IMR, 2010)*". From the report, it is apparent that the recorded number of birds and mammals caught by the gear is 0 (as reported in Bowering et al. 2011). I recognize the fact that this is only based on data from the reference fleet, but indeed I do not interpret the word "comprehensive" as equal to 100% fleet coverage as I don't think this is in the spirit of the MSC. If we accept the reference fleet as representative of the fleet itself (and I guess you did as it is evinced by the text), then I have some issue to understand why **P 2.3.3** did not achieve at least the 95 scoring. It would be ideal to provide the confidence interval of the 0 estimates to evaluate their level of precision.

In principle, the assessment team would not disagree with the PR's comments but as this is an area of great concern to many NGOs we have opted to take a more conservative approach to interpreting and scoring the criteria. Specifically, the limited data available fall short of being sufficient to "evaluate with a high degree of certainty whether a strategy is achieving its objectives".

PI 2.4.1 and 2.4.2: I interpret here the habitat structure as the bottom habitat (although it might be interpreted in a completely different way, i.e. the structure of the pelagic habitat). In this case, why the data on the eventual interaction of the gear with the bottom habitat collected by the observers on board the reference fleet have not been used? These data should have been crucial to evaluate the scoring of this guidepost, assuming again that the reference fleet is representative of the entire fleet. If no contact with the bottom has been recorded by observers, then the scoring is not correct. At least, the evaluator should mention the existence of these data and their importance for scoring. Also, the scoring at **PI 2.4.1** is inconsistent with the scoring and justification given at **PI 2.4.2**. If purse seines and pelagic trawls do not have any contact with the seabed habitats, as implicitly stated in **PI 2.4.2**, then scoring in **PI 2.4.1** is not correct.

The assessment team doesn't accept that there is any inconsistency or contradiction in the approach to scoring. The comments in 2.4.1 set the general scene with respect to pelagic fishing while 2.4.2 deals with habitat protection with respect to all fishing, including pelagic, even though it is recognized that for all practical purposes pelagic fishing has no adverse effects.

PI 2.4.3: As for **PI 2.4.1** and **PI 2.4.2**, data on the eventual interaction of the gear with the bottom habitat collected by the observers on board the reference fleet should have been used. Thus, even if the scoring might be adequate, the justification is not relevant and flawed. On the other hand, if these data are not available or have not been collected (which it does not seems the case here), scoring of **PI 2.4.3b** is not correct and should be reduced at least to 80.

This is a disputable point. The assessment team understands the PR's comment but are not conviced to change the scoring.

PI 2.5.1: Although I might agree with the scoring here (again if seen solely under the very strict application of the guidepost text), it would be important for the reader to know what kind of evidence is needed to score 100. I suspect that the evaluator implicitly refers to "ecosystem modeling of fisheries effect". I consider that it is extremely complex to disentangle fisheries from other effects on the ecosystem, unless clear cut scenario has been historically experienced by the ecosystem itself (e.g. collapse of a species, which lead to detectable consequences for the ecosystem). For NSH, this actually occurred in the 1970s, but they were no measurable consequences at the ecosystem level. Also, if all stocks are managed according to $F_{MSY,}$ herring is not a key species and the gear has no habitat impact, then it is very difficult to advocate that the fisheries has "a serious or irreversible harm" on the ecosystem.

Text is amended.

PI 2.5.2 a: Again, I think the justification here is in part inconsistent with what reported in the scoring of previous points. The only theoretically serious or irreversible harm to the key elements of ecosystem structure and function is through the overfishing of the NSH stock itself and this should be clearly stated in the text. The scoring is justified as the NSH stock is managed according to MSY, but the text in the justification is partially not in line with what requested under **PI 2.5.2a**.

Text is amended.

In general **PI 2.4** and **PI 2.5** are only partially substantiated by scientific literature. The main interaction between the fishery and the different parts of the ecosystem is through the direct removal of herring. There are several papers which investigate the relationship between fisheries and ecosystem in the North Sea but these are not included in the reference list. These would have been a valuable addition in the text used for the justification of the scoring. For example, the role of herring as a prey species has been investigated using multispecies models, such as multispecies virtual population analysis (Vinther, 2001; Kempf et al., 2006), stochastic multispecies (SMS) model (Lewy and Vinther, 2004), and Ecopath with Ecosim (Mackinson and Daskalov, 2007). There are also numerous studies (the list is not meant to be exhaustive) on herring and its function in the ecosystem (see Dickey-Collas et al., 2010 and several ICES working groups reports and references therein for a comprehensive review).

The assessment team is grateful for the PR for drawing these references to our attention; they have now been cited in the appropriate places.

References

Dickey-Collas et al., 2010. Lessons learned from stock collapse and recovery of North Sea herring: a review. ICES Journal of Marine Science, 67: 1875–1886.

ICES, 2008c. Report of the Working Group for Regional Ecosystem Description (WGRED), 25–29 February 2008, ICES, Copenhagen, Denmark. ICES CM 2008/ACOM:47. 203 pp.
ICES, 2011. Report of the Working Group on Multispecies Assessment Methods (WGSAM), 10–14 October 2011, Woods Hole, USA. ICES CM 2011/SSGSUE:10. 229 pp.

ICES, 2012. Report of the Working Group on the Ecosystem Effects of Fishing Activities (WGECO), 11–18 April 2012, Copenhagen, Denmark. ICES CM 2012/ACOM:26. 192 pp.

ICES, 2012. Report of the Herring Assessment Working Group for the Area South of 62 N (HAWG), 13 - 22 March 2012, Copenhagen, Denmark. ICES CM 2012/ACOM:06. 835 pp.

Kempf, A., Floeter, J., and Temming, A. 2006. Decadal changes in the North Sea food web between 1981 and 1991—implications for fish stock assessment. Canadian Journal of Fisheries and Aquatic Sciences, 63: 2586–2602.

Lewy, P., and Vinther, M. 2004. A stochastic age–length-structured multispecies model applied to North Sea stocks. ICES Document CM 2004/FF: 20. 33 pp.

Mackinson, S., and Daskalov, G. 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Science Series Technical Report, Cefas Lowestoft, 142. 196 pp.

Vinther, M. 2001. Ad hoc multispecies VPA tuning applied for the Baltic and North Sea fish stocks. ICES Journal of Marine Science, 58: 311–320.

PI 3.1.1: It is not clear which is the status of the Norwegian system for fisheries management in the case of human coastal populations. For the most important species, significantly and proportionately larger quota shares are allotted to coastal fisheries than to the ocean going fleet, which might make the reader thinking that some sort of agreement is actually in place. However, from the text, it is not clear if a formal law exists or what kind of agreement regulates the quota allocation of marine fish to the human coastal populations.

There is no formal law, but firm practice over several decades and agreement about the division between the coastal and ocean-going fleet in the Norwegian Fishermen's Association, which incorporates both groups.

PI 3.1.1: The scoring here is inconsistent with what reported for Norwegian spring spawning herring. There are currently no binding dispute resolution mechanisms within the Coastal States agreement, which can effectively and legally resolve eventual disputes. Thus, there is no guarantee that the case of the national TAC setting of Norwegian spring spawning herring by Faroe Islands in 2013 would not materialize also for North Sea herring in the future or for any other shared stock. Thus, if the rationale for the Faroe Islands case is correctly made, it should apply here as well and a condition should be raised.

Disputes between Norway and EU are solved within the frameworks of the 2008 agreement on the regulation of the North Sea and Skagerrak herring fishery, and the annual fisheries consultations. There is no requirement that these procedures are formalized as a binding agreement. The system is considered to be effective, unlike the case with Norwegian spring spawning herrig, insofar as no major disputes have emerged.

PI 3.1.4: from the justification text, it seems as all kind of subsidies have been eliminated for the Norwegian pelagic fleet, is this the case also for the fuel subsides?

Direct subsidies to the Norwegian fishing fleet were terminated in 1990 following the agreement between the European Free Trade Area signatories, negotiated in preparation of the European Economic Area Agreement. Excemption from CO2 tax remains. However, there is currently no overcapacity in Norwegian fisheries, and this excemption cannot by itself lead to such overcapacity or any any other way be an incentive for fisherers to fish unsustainably. GCB4.5.1 understands 'subsidies' as 'subsidies that obviously contribute to unsustainable fishing'.

PI 3.2.4: I am not aware of the existence of a comprehensive research plan providing the management system with a coherent and strategic approach to research across P1, P2 and P3. Research exists but it is not formalized in a plan. Especially for P2, this is not the case and thus the scoring should be reduced to 80.

GCB4.10.2 states that while P1 and P2 concerns 'specific information or research programs to deliver them', PI 3.2.4 'is concerned with the presence or otherwise of overall strategic research planning'.

MSC FISHERY ASSESSMENT REPORT

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**Conformity Assessment Body Response**
Justification: **See comments above.**		

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**NA**	**Conformity Assessment Body Response**
Justification:		

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**NA**	**Conformity Assessment Body Response**
Justification:		

MSC FISHERY ASSESSMENT REPORT

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	NA	NA	
1.1.2	Yes	Yes	NA	NA	
1.1.3	Yes	Yes	NA	NA	
1.2.1	Yes	Yes	NA	NA	
1.2.2	Yes	No	NA	See text above	See text above
1.2.3	Yes	No	NA	See text above	See text above
1.2.4	Yes	Yes	NA	NA	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Yes	No	NA	See text above	See text above
2.1.2	Yes	Yes	NA	NA	
2.1.3	Yes	No	NA	See text above	See text above
2.2.1	Yes	Yes	NA	NA	
2.2.2	Yes	Yes	NA	NA	
2.2.3	Yes	Yes	NA	NA	
2.3.1	Yes	Yes	NA	NA	
2.3.2	Yes	Yes	NA	NA	
2.3.3	Yes	No	NA	See text above	See text above

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.1	Yes	No	NA	See text above	See text above
2.4.2	Yes	No	NA	See text above	See text above
2.4.3	Yes	No	NA	See text above	See text above
2.5.1	Yes	No	NA	See text above	See text above
2.5.2	Yes	No	NA	See text above	See text above
2.5.3	Yes	Yes	NA	NA	
3.1.1	Yes	No	Yes	See text above	See text above

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.2	Yes	Yes	NA	NA	
3.1.3	Yes	Yes	NA	NA	
3.1.4	Yes	Yes	NA	See text above	See text above
3.2.1	Yes	Yes	NA	NA	
3.2.2	Yes	Yes	NA	NA	
3.2.3	Yes	Yes	NA	NA	
3.2.4	Yes	No	NA	See text above	See text above
3.2.5	Yes	Yes	NA	NA	

Any Other Comments

Comments	Conformity Assessment Body Response

Appendix 3. Stakeholder submissions

No written submissions were made by stakeholders during consultation opportunities on:

- The announcement of reassessment
- Proposed assessment team or revised assessment team
- Proposed peer reviewers or revised peer reviewers
- Proposed assessment tree

Appendix 3.1: Stakeholder submissions to Public comment draft report

25.4.2014 the assessment team received a submission from MSC, MSC Review and Report on Compliance with the scheme requirements. The report was provided for action by the CAB and ASI in order to improve consistency with the MSC scheme requirements. Results of the MSC's review in full and responses of the assessment team are presented in the table below.

Ref	Type	Page	Requirement	Reference	Details	PI	Assessment team response
4018	Major	104	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's Conclusion	For scoring Key low trophic species in 1.1.2, d). The rationale provided does not support the format outlined in CB2.3.13, detailing how the species explicitly meets or does not meet the 3 sub-criteria listed. For reference in this regard, the paper by Essington and Plagayani, 2013 listed in the GCR may be helpful. Recent assessments for other fisheries targeting NS herring have also been completed (Scottish Pelagic Sustainability Group Ltd (SPSG) North Sea herring and SPFPO Swedish NS herring), which followed the correct format and could be useful as an example.		Text in rationale for PI 1.1.2 is modified to refer directly to the sub-criteria in CB 2.3.13 and evidence is provided in support of a failure to meet the requirements for a key LTL species.
4023	Guidance	17			In the section on IPI stocks, the statement on the catches of WBSSH being less than 15% is correct, but could be expanded here to clarify that cathces are in fact below 2% as written in the scoring rationale and clarified in the variation request submitted to this effect and available on the website.		Section 3.1.4 is amended to clarify that the proportion of WBSSH is less than 1.5% (average 2010-2012).

4025	Guidance	87	CR-27.12.2.1 v.1.3	27.12.2 If the CAB determines the systems are sufficient, fish and fish products from the fishery may enter into further certified chains of custody and be eligible to carry the MSC ecolabel. The CAB shall determine:27.12.2.1 The scope of the fishery certificate, including the parties and categories of parties eligible to use the certificate and the point(s) at which chain of custody is needed. a. Chain of custody certification shall always be required following a change of ownership of the product to any party not covered by the fishery certificate. b. Chain of custody certification may be required at an earlier stage than change of ownership if the team determines that the systems within the fishery are not sufficient to make sure all fish and fish products identified as such by the fishery originate from the certified fishery. c. If the point where chain of custody certification is required is covered by the fishery certificate, the team shall determine the parties or category of parties covered by the fishery certificate that require chain of custody certification.	The report is unclear if the "current list of approved buyers" restricts the eligibility of the products sold.		Section 5.2 “Traceability within the Fishery” is amended to clarify that eligible buyers outside of Norway also are permitted to buy the certified product.

4027	Guidance	86	CR-27.12.1.3 v.1.3	27.12.1 The CAB shall determine if the systems of tracking and tracing in the fishery are sufficient to make sure all fish and fish products identified and sold as certified by the fishery originate from the certified fishery. The CAB shall consider the following points and their associated risk for the integrity of certified products: 27.12.1.3 The opportunity of substitution of certified with noncertified fish prior to or at landing fraudulent claims from within and outside ther certified fishery.	The report does not contain a description of how products from the certified fishery are segregated from the non-certified products if vessels fish in different areas on the same trip.		Section 5.2 amended to clarify how catch is reported per area and there is no mixing with non-certified fish.

This report is provided for action by the CAB and ASI in order to improve consistency with the MSC scheme requirements; MSC does not review all work products submitted by Conformity Assessment Bodies and this review should not be considered a checking service. If any clarification is required, please contact Robert Lefebure on +44 (0)207 246 8900 for more information."

Best regards,
Fisheries Oversight Director
Dan Hoggarth
Marine Stewardship Council

cc: Accreditation Services International

Appendix 4. Surveillance Frequency

(REQUIRED FOR THE PCR ONLY)

1. The report shall include a rationale for determining the surveillance score.

2. The report shall include a completed fishery surveillance plan table using the results from assessments described in CR 27.22.1

Table A4: Fishery Surveillance Plan

Score from CR Table C3	Surveillance Category	Year 1	Year 2	Year 3	Year 4
[e.g. 2 or more]	[e.g. Normal Surveillance]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit & re-certification site visit]

Appendix 5. Client Agreement

(REQUIRED FOR PCR)

The report shall include confirmation from the CAB that the Client has accepted the PCR. This may be a statement from the CAB, or a signature or statement from the client.

(Reference: CR: 27.19.2)

Appendix 5.1 Objections Process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)

The report shall include all written decisions arising from an objection. *(Reference: CR 27.19.1)*

Appendix 6: List of vessels in the coastal group engaged in the Skagerrak Herring fishery in 2012[67]

Boatname	Registration N
Ponny	Ø -0071-H
Spjæril	Ø -0128-H
Spjæringen	Ø -0083-H
Tenholmskjær	Ø -0009-H
Vestervik	H -0010-K

[67] Reservation: The Norwegian Fishermen's` sales organisation for pelagic fish publishes this information with reservations for any errors or defects in the information caused by technical or human error. If you suspect errors or lack of information, please contact Norges Sildesalgslag.

Appendix 7: List of vessels in the coastal group engaged in the North Sea Herring fishery in 2012[68]

Boatname	Registration N
Albacore	SF-0018-F
Anglevik	H -0030-B
Artus	M -0079-HØ
Atløy Viking	SF-0008-A
Bergblom	H -0085-B
Bluefin	SF-0012-F
Bogafisk	H -0011-S
Buefjord	SF-0147-A
Bøen	R -0085-ES
Bømmelfjord	H -0083-B
Columbus	H -0017-O
Dennis	AA-0085-L
Elias	H -0002-O
Fruholmen	H -0178-AV
Frøyabuen	SF-0014-B
Frøybas	SF-0075-B
Gould Dollar	SF-0300-A
Gry Marita	H -0027-B
Harengus	H -0022-B
Harto	M -0061-SØ
Havsula Junior	H -0100-B
Havørn I	H -0121-B
Hosøybuen	H -0055-L
Hovda	R -0006-F
Hovden Viking	SF-0004-S
Hugøybas	H -0032-B
Idsegutt	R -0017-ST
Julie	H -0002-L
Jøkul	M -0108-HØ
Kathrin G	M -0020-MD
Knut Olav	H -0086-B
Krossøy	H -0034-BN
Kystfisk	SF-0003-V

[68] Reservation: The Norwegian Fishermen's` sales organisation for pelagic fish publishes this information with reservations for any errors or defects in the information caused by technical or human error. If you suspect errors or lack of information, please contact Norges Sildesalgslag.

Lyn	R -0162-K
Mokstein	H -0114-AV
Morten	H -0007-R
Nyskjer	M -0072-MD
Nøstbakk	H -0188-B
Ocean	M -0004-A
Olemann	SF-0022-G
Ringbas	SF-0006-V
Rodian	R -0014-SD
Romi	H -0005-R
Sjarmør	SF-0017-SU
Sjohav	H -0004-K
Sjonglør	SF-0051-SU
Sjøbas	R -0129-K
Sklinnabanken	N -0250-BR
Snøgg	H -0134-B
Spjæril	Ø -0128-H
Spjæringen	Ø -0083-H
Stokke Senior	M -0012-U
Staaløy	H -0095-AV
Sulehav	SF-0001-SU
Svanen	R -0006-V
Svebas	SF-0008-SU
Sørvest	H -0022-S
Therese	H -0035-S
Tim	H -0077-T
Tin	H -0306-B
Torino	R -0172-K
Torøy	H -0129-S
Tunfisk	H -0260-K
Vestbris	SF-0050-G
Vestbris I	H -0008-AM
Vestervik	H -0010-K
Vestervon	SF-0011-A

Appendix 8: List of vessels in purse seiner group engaged in the Skagerrak Herring fishery in 2012[69]

Boatname	Registration N
Rav	ST-0008-O
Vea	R -0007-K

[69] Reservation: The Norwegian Fishermen's` sales organisation for pelagic fish publishes this information with reservations for any errors or defects in the information caused by technical or human error. If you suspect errors or lack of information, please contact Norges Sildesalgslag.

Appendix 9: List of vessels in purse seiner group engaged in the North Sea Herring fishery in 2012[70]

Boatname	Registration N
Birkeland	H -0087-AV
Bjarne Nilsen	F -0004-H
Brennholm	H -0001-BN
Christina E	M -0150-HØ
Dyrnesvåg	M -0158-SM
Elisabeth	H -0140-B
Endre Dyrøy	H -0015-F
Eros II	M -0060-HØ
Fiskebas	SF-0208-F
Fiskeskjer	M -0525-H
Fonnes	H -0010-AM
Frantsen Junior	T -0025-I
Gambler	SF-0046-V
Gambler (2)	SF-0046-V
Gardar	H -0011-AV
Gerda Marie	H -0032-AV
Gunnar Langva	M -0139-A
H. Østervold	H -0088-AV
Hardhaus	H -0120-AV
Hargun	H -0001-O
Harmoni	T -0074-T
Harmoni	T -0079-T
Harvest	H -0003-AV
Haugagut	H -0050-AV
Havdrøn	H -0081-BN
Havglans	H -0005-ØN
Havskjer	M -0200-A
Havsnurp	M -0095-MD
Havsnurp	M -0195-MD
Havstål	M -0260-A
Herøy	M -0620-HØ
Herøyhav	M -0520-HØ
Inger Hildur	M -0100-F

[70] Reservation: The Norwegian Fishermen's` sales organisation for pelagic fish publishes this information with reservations for any errors or defects in the information caused by technical or human error. If you suspect errors or lack of information, please contact Norges Sildesalgslag.

Ingrid Majala	F -0184-M
Kanstadfjord	N -0189-LN
Ketlin	N -0119-SO
Kings Bay	M -0021-HØ
Knester	H -0009-AV
Krossfjord	H -0069-S
Kvannøy	N -0400-B
Leinebjørn	M -0006-HØ
Libas	H -0005-F
Ligrunn	H -0001-F
Manon	H -0026-AV
Norafjell	N -0134-LN
Norderveg	H -0179-AV
Nordervon	H -0181-AV
Nordfisk	N -0001-B
Nybo	M -0056-MD
Odd Lundberg	T -0111-G
Ordinat	H -0090-AV
Rav	ST-0008-O
Roaldsen	R -0080-ES
Rogne	M -0004-HØ
Rogne	M -0042-HØ
Rogne	N -0024-LN
Rogne	N -0040-LN
Rødholmen	N -0118-LN
Røttingøy	H -0004-O
Selvåg Senior	N -0024-ME
Senior	N -0200-B
Siglar	H -0035-F
Sjøbris	M -0122-HØ
Slaatterøy	H -0010-AV
Smaragd	M -0064-HØ
Storeknut	H -0380-AV
Stormfuglen	M -0038-AV
Strand Senior	M -0425-H
Straumberg	N -0002-LF
Stålringen	N -0075-DA
Svanaug Elise	ST-0019-F
Sæbjørn	M -0027-VD
Talbor	H -0074-AV
Teigenes	M -0001-HØ
Tromsbas	T -0009-T
Trønderbas	NT-0500-V

MSC FISHERY ASSESSMENT REPORT

Vea	R -0007-K
Vendla	H -0040-AV
Vestfart	SF-0005-B
Vestviking	H -0012-AV
Østerbris	H -0127-AV
Åkerøy	N -0300-DA

Appendix 10: List of vessels in trawl group engaged North Sea Herring fishery in 2012[71]

Boatname	Registration N
Bømmelbas	H -0444-B
Cetus	R -0094-K
Fiskebank	M -0022-SM
Gollenes	M -0031-HØ
Harvest	H -0003-AV
Hellevig	VA-0015-S
Herøyfjord	M -0010-HØ
Håflu	R -0035-B
Johan Feyer	R -0004-ES
K.M Østervold	H -0080-AV
K.M. Østervold	H -0208-AV
Leik	R -0044-K
Lønningen	H -0200-B
Lønnøy	H -0007-B
Morten Einar	H -0005-AV
Mostein	H -0569-B
Piraja	VA-0095-K
Sille Marie	VA-0010-S
Skude Senior	R -0004-K
Svanavåg	R -0003-ES
Sævikson	M -0072-HØ
Trygvason	H -0718-B
Traal	R -0015-K
Østanger	H -0148-AV

[71] Reservation: The Norwegian Fishermen's` sales organisation for pelagic fish publishes this information with reservations for any errors or defects in the information caused by technical or human error. If you suspect errors or lack of information, please contact Norges Sildesalgslag.

Appendix 11: List of vessels in SUK group engaged in North Sea herring fishery in 2012[72]

Boatname	Registration N
Abelone Møgster	H -0015-AV
Einar Erlend	N -0045-ME
Gunnar K	N -0246-Ø
Hepsøhav	ST-0001-O
Hillersøy	SF-0220-A
Julianne III	T -0021-T
Kamøyfisk	H -0180-AV
Paul Senior	M -0174-AV
Radek	H -0008-AV
Sjøglans	SF-0002-A
Skagøysund	T -0023-T
Skarholmen	N -0001-BØ
Skulbaren	T -0111-T
Slettholmen	N -0110-L
Støttfjord	N -0001-ME
Vestbas	M -0116-HØ
Vikanøy	N -0210-BØ

[72] Reservation: The Norwegian Fishermen's` sales organisation for pelagic fish publishes this information with reservations for any errors or defects in the information caused by technical or human error. If you suspect errors or lack of information, please contact Norges Sildesalgslag.

Appendix 12: Variation request and Variation response IPI stock

Marine Stewardship Council
Variation Request Form

This form details the information required from CABs to enable the MSC to consider a request to vary from the Certification Requirements.
Please complete all unshaded fields. Where instructions are included in italics, please delete and replace with the described information.
Once complete, delete this first page of the document, save as a PDF file and send to either:

- The MSC Fishery Assessment Manager assigned to the certified fishery/fishery being assessed, or
- coc@msc.org, if the variation is requested in relation to a CoC requirement.

On receipt, the MSC will consider your request and will usually respond within 14 days.
If your variation request is regarding a fishery requirement, please note that all approved variation request forms and the MSC response to the request will be published on the MSC website with announcements for the fishery.
This does not apply to the optional 'Confidential Information' section on page 3 of this document. If this is not required it can be left blank and deleted from the final completed Variation Request Form sent to the MSC. If used, the information will be used by MSC in considering the variation request but the page with this section will be deleted from the form before it is published.

MSC FISHERY ASSESSMENT REPORT

DNV·GL

Marine Stewardship Council - Variation Request Form V1.3

Date submitted to MSC	*17.07.2013*
Conformity Assessment Body	Det Norske Veritas (DNV)
Fishery Name/CoC Certificate Number	Norway North Sea and Skagerrak herring
Lead Auditor/Programme Manager	Ms. Sandhya Chaudhury
Scheme requirement(s) to vary from	27.4.10: If IPI stocks are identified and are below the level of 15% specified in 27.4.9.1.c), the CAB shall , as early as practicable in the assessment process, and following the variation request procedure set out in Part A, clause 4.12, submit a variation request to the requirements 27.4 to the MSC to either: A27.4.10.1 Allow fish or fish products to be considered as coming from IPI stocks to enter into chains of custody, or **B27.4.10.1 Allow an exemption to requirements for IPI stocks.**
Is this variation sought in order to undertake an expedited P1 assessment (CR annex CL)?	No

Proposed variation
Exemption to requirements for IPI stocks.

Rationale/Justification
The incidental catches of Baltic herring in this fishery is classified as IPI catches, as defined under 27.4.9 ;being a non-target stock that is practically inseparable from the target stock, which furthermore does not exceed more than 15% by weight of the combined catch of the target stock and the IPI stock. The WBSSH migrate into parts of Division IIIa and eastern Division IVa where they mix with North Sea autumn spawners. They cannot be separated in the catches and post hoc estimation of the proportions of each stock component in the catches is made by biological sampling. There are currently no specific management objectives for the stock and there is no agreed management plan in place but ICES advice on the management of the WBSS herring stock is on the basis of a transition to MSY fishing mortality targets. This system has worked well with the agreed TAC in line with the advice. Estimates of the total catch of WBSSH have not exceeded the agreed TAC since 2010. Firm control on the exploitation of the WBSS component has been achieved in part by a management measure, introduced in 2011, that allows the transfer up to 50% of Div IIIa quotas to a transfer area in Division IVa east. Monitoring shows that about 40% of the Div IIIa TAC was taken in the North Sea transfer area in 2011 and 2012. On the assumption that this strategy is maintained, and ICES advice followed, it is anticipated that SSB will continue to grow above MSY Btrigger over the next two years. Target reference points MSY $B_{trigger}$ = 110 kt; F_{MSY} 0.28; B_{lim} 90 kt;

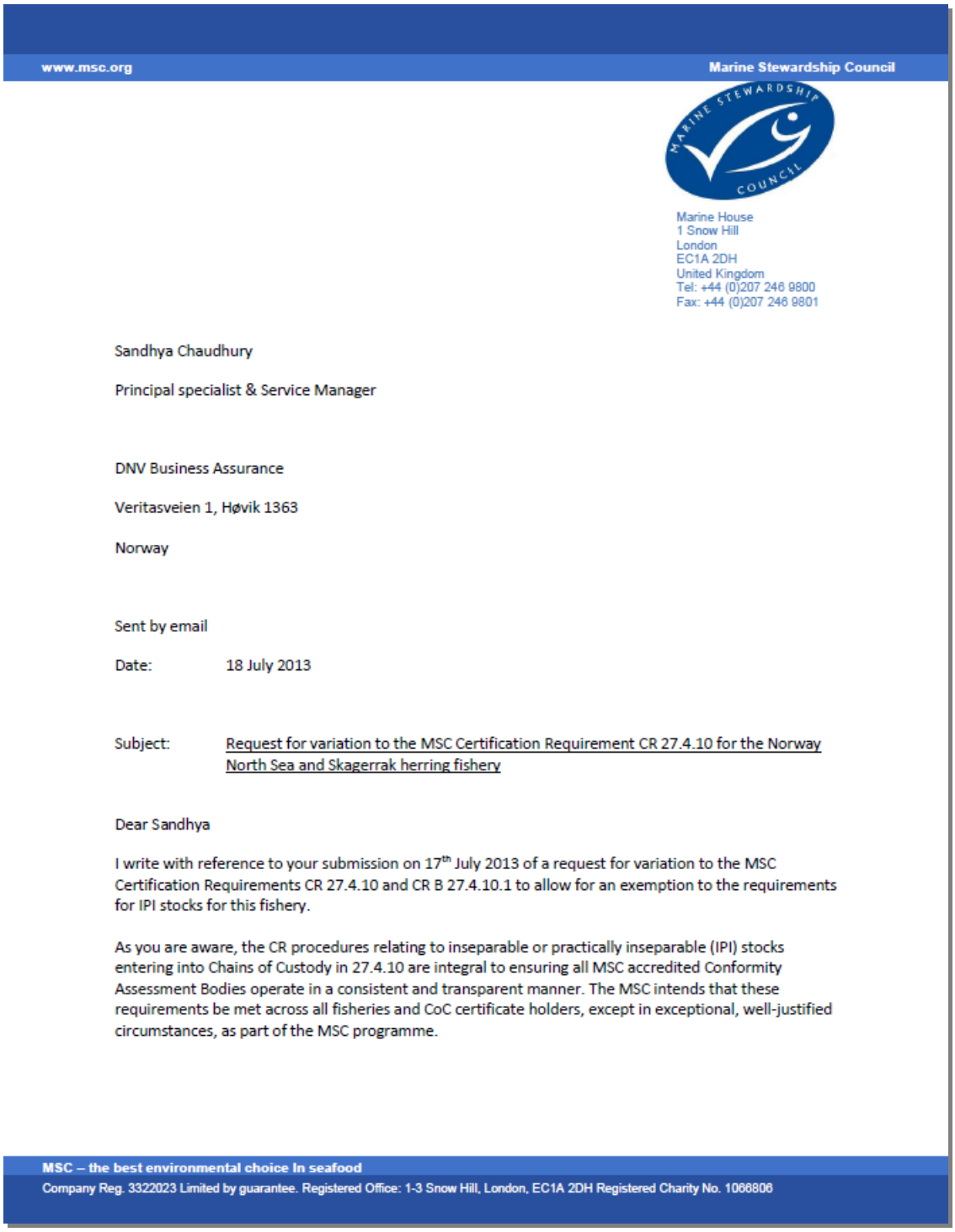
B_{pa} 110 kt.

Catches from this fishery are very small and do not negatively impact the stock overall. WBSSH catches are <1.5 % - i.e. 1103 t of the total Norwegian catch of North Sea herring of 75591 t (Three-year average 2010–12, based on data from "The Wonderful Table" of the ICES Herring Assessment Working Group 2013) and do not qualify as main retained species. SSB is at 87 936 t and F at 0.33; F has shown a steady decline over the past 5-6 years, but is still higher than FMSY; stock has been relatively stable over the same period at or about Blim. Currently there is no internationally agreed management plan or harvest control rule. Nevertheless, the ICES approach to annual assessment of this stock and its provision of advice to fishery management bodies has been basing its advice on precautionary principles. Furthermore, even in the absence of a formally agreed management plan, the ICES precautionary advice has been adopted as the basis for the EU–Norway management of this fish stock.

Implications for assessment (required for fisheries assessment variations only)
The Baltic herring catches will ultimately enter chains of custody along with the NS herring, but the proportion is very low. The Baltic herring catches are scored under the PI 2.1 (Retained species)

Have the stakeholders of this fishery assessment been informed of this request? (required for fisheries assessment variations only	No, the client has been informed is writing and stakeholders will be informed once the variation is granted.

Further Comments
Please include any further relevant information.



www.msc.org Marine Stewardship Council

Marine House
1 Snow Hill
London
EC1A 2DH
United Kingdom
Tel: +44 (0)207 246 9800
Fax: +44 (0)207 246 9801

Sandhya Chaudhury

Principal specialist & Service Manager

DNV Business Assurance

Veritasveien 1, Høvik 1363

Norway

Sent by email

Date: 18 July 2013

Subject: Request for variation to the MSC Certification Requirement CR 27.4.10 for the Norway North Sea and Skagerrak herring fishery

Dear Sandhya

I write with reference to your submission on 17th July 2013 of a request for variation to the MSC Certification Requirements CR 27.4.10 and CR B 27.4.10.1 to allow for an exemption to the requirements for IPI stocks for this fishery.

As you are aware, the CR procedures relating to inseparable or practically inseparable (IPI) stocks entering into Chains of Custody in 27.4.10 are integral to ensuring all MSC accredited Conformity Assessment Bodies operate in a consistent and transparent manner. The MSC intends that these requirements be met across all fisheries and CoC certificate holders, except in exceptional, well-justified circumstances, as part of the MSC programme.

MSC – the best environmental choice in seafood

Company Reg. 3322023 Limited by guarantee. Registered Office: 1-3 Snow Hill, London, EC1A 2DH Registered Charity No. 1066806

MSC notes the factors presented in your letter supporting your request, including:

- That western Baltic spring spawning herring (WBSSH) can be defined as IPI catches, as they are practically inseparable from the target stock of North Sea herring during normal fishing operations, they comprise less than 15% of the overall catch, they are not certified separately and they are not ETP species.

- Post hoc estimation of the proportions of each stock component in the catches is made by biological sampling, which indicates that WBSSH catches are a very small (<1.5% - i.e 1103 t) percentage of the total Norwegian catch of North Sea herring (estimated at 75,591 t – based on a three-year average 2010–12 on data from "The Wonderful Table" of the ICES Herring Assessment Working Group 2013). The very small catches from this fishery means that they do not negatively impact the overall stock. The current SSB for this stock is at 87,936 t and the agreed TAC has not been exceeded since 2010.

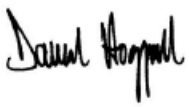
- The status of the WBSSH stock remains stable at or about Blim and although F is higher than Fmsy, it has been declining steadily over the past 5-6 years. Although, there is no formally agreed management plan, the ICES precautionary advice has been adopted as the basis for the EU–Norway management of this fish stock.

Given the rationale provide, the MSC is willing to grant a variation to the CR in this case subject to the following conditions.

- All stakeholders are informed that WBSSH are exempt from the IPI requirements and that they will be entering the Chain of Custody from this fishery, should the fishery pass certification.

If you have any questions regarding this response, please do not hesitate to contact Robert Lefébure, the Fisheries Assessment Manager for this fishery either by email, Robert.lefebure@msc.org or phone +44 (0)20 7246 8935.

Best regards,



Dan Hoggarth

Fisheries Oversight director

Marine Stewardship Council

Appendix 13 Details of scoring for the compared assessments

	Difference in score equal to or below threshold of 15 points						
	difference in score > 15 points, but >50% of other fisheries are alligned; no comment required						
	Difference in score > 15 points, <50% of other fisheries are alligned - see further comment						
	Condition						
	Fishery	**Norway North Sea and Skagerrak herring**	**SPFPO Swedish North Sea herring**	**Danish Pelagic Producers Organisation North Sea herring**	**Pelagic Freezer Trawler Association North Sea herring**	**Scottish Pelagic Sustainability Group Ltd North Sea herring**	**Hastings Fleet Herring Drift Net Fishery**
	Source		Public Certification Report - 14 June 2013	Public certification report - 24th June 2009	Public certification report - 17th May 2011	Final report and determination - 30 April 2013	Public Certification Report - 3 August 2012
	Comment		Reassessment	Rescored at SA2	No rescores in later surveillance reports	Reassessment	Reassessment
PI No.	Performance Indicator (PI)						
1.1.1	Stock status	100	100	90	90	100	90
1.1.2	Reference points	100	80	90	90	80	90
1.1.3	Stock rebuilding						
1.2.1	Harvest strategy	100	95	90	90	85	95
1.2.2	Harvest control rules & tools	80	75	75; rescored to 100 at SA2	70	75	75
1.2.3	Information & monitoring	90	90	90	85	90	90
1.2.4	Assessment of stock status	100	90	90	95	95	95
2.1.1	Outcome	90	100	95	90	90	100
2.1.2	Management	90	95	100	80	90	80
2.1.3	Information	85	100	95	90	95	80
2.2.1	Outcome	100	100	100	100	100	100
2.2.2	Management	100	80	90	100	90	80
2.2.3	Information	95	80	80	95	80	80
2.3.1	Outcome	100	95	100	100	85	100
2.3.2	Management	95	80	100	90	80	80
2.3.3	Information	85	80	95	90	80	80
2.4.1	Outcome	95	100	100	90	100	10
2.4.2	Management	100	95	100	90	95	80
2.4.3	Information	90	95	95	95	95	90
2.5.1	Outcome	95	80	90	80	80	80
2.5.2	Management	100	80	80	90	80	80
2.5.3	Information	100	100	90	95	80	90
3.1.1	Legal & customary framework	85	95	100	95	95	90
3.1.2	Consultation, roles & responsibilities	90	85	90	100	85	90
3.1.3	Long term objectives	100	100	100	100	100	80
3.1.4	Incentives for sustainable fishing	100	80	100	100	80	80
3.2.1	Fishery specific objectives	90	80	80	90	80	80
3.2.2	Decision making processes	90	80	80	95	80	80
3.2.3	Compliance & enforcement	100	95	70 - rescored to 100 at SA2	100	95	85
3.2.4	Research plan	100	80	100	90	80	90
3.2.5	Management performance evaluation	100	80	95	80	80	80