DNV·GL

FULL ASSESSMENT REPORT

Norway Skagerrak and Norwegian Deep cold water prawn fishery

Final report

Norges Fiskarlag

Authors: Julian Addison, Geir Hønneland and Sigrun Bekkevold
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Customer:	Norges Fiskarlag P.b. 1233 Sluppen, 7462 Trondheim, Norway	1322 HØVIK, Norway Tel: +47 67 57 99 00
Contact person:	Tor Bjørkland Larsen	http://www.dnvgl.com
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Julian Addison Independent P1 & P2 expert and team leader	[Name] [title]	
Geir Hønneland Independent P3 expert		
Sigrun Bekkevold Team member		

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0	2015-12-03	Preliminary Draft Report for Client review	Julian Addison, Geir Hønneland, Sigrun Bekkevold		
1	2016-02-02	Peer Review Draft Report	Same as above		
2	2016-02-23	Public Comment Draft Report	Same as above		
3	2016-05-12	Final report	Same as above		

Table of contents

ABBREVIATIONS

ACOM	(ICES) Advisory Committee on Management
AGSE	Joint ICES/OSPAR Ad hoc Group on Seabird Ecology
AIS	Automated Identification System
DTU Aqua	National Institute of Aquatic Resources (Denmark)
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened or protected species
EU	European Union
FAM	Fisheries Assessment Methodology
ICES	International Council for the Exploration of the Sea
LPUE	Landings Per Unit Effort
MSC	Marine Stewardship Council
NEZ	Norwegian Economic Zone
NGO	Non – Governmental Organization
OSPAR	Oslo and Paris Commission for the protection and conservation of the North-East Atlantic and its Resources
PI	Performance Indicator
PISG	Performance Indicator Scoring Guidepost
RAC	Regional Advisory Council
SG	Scoring Guidepost
SLU	Swedish University of Agricultural Sciences
SwAM	Swedish Agency for Marine and Water Management
TAC	Total Allowable Catch
VME	Vulnerable Marine Ecosystems
VPA	Virtual population analysis
WGECO	Working Group on Ecosystem Effects of Fishing Activities
WGMME	(ICES) Working Group on Marine Mammal Ecology
WWF	World Wide Fund for Nature

LIST OF SYMBOLS AND 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}	Fishing mortality rate that is expected to be associated with stock 'collapse' if maintained over a longer time (precautionary 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

LIST OF FISH AND OTHER SPECIES

American plaice	*Hippoglossoides platessoides*
Angel shark	*Squatina squatina*
Angler fish	*Lophius piscatorius*
Basking shark	*Cetorhinus maximus*
Blackmouth cashark	*Galeus melastomus*
Blue whiting	*Micromesistius poutassou*
Bony fish (class of)	*Osteichthyes*
Cod	*Gadus morhua*
Common skate	*Dipturus batis*
Crimson pasiphaeid shrimp	*Pasiphaea tarda*
Giant manta ray	*Manta birostris*
Glass/White shrimp	*Pasiphea multidentata*
Greater argentine	*Argentina silus*
Guitarfishes	*Rhinobatidae*
Haddock	*Melanogrammus aeglefinus*
Harbour porpoise	*Phocoena phocoena*
Lesser argentine	*Argentina sphyraena*
Ling	*Molva molva*

Lumpfish	*Cyclopterus lumpus*
Mobula rays	*Mobula spp.*
Norway pout	*Trisopterus esmarkii*
Norwegian shrimp	*Pontophilus norvegicus*
Pale ray	*Dipturus linteus*
Pink shrimp	*Pandalus montagui*
Porbeagle	*Lamna nasus*
Rabbit fish	*Chimaera monstrosa*
Reef manta ray	*Manta alfredi*
Saithe	*Pollachius virens*
Sawfish	*Pristis spp.*
Shrimp	*Pandalus borealis*
Smooth lanternshark	*Etmopterus pusillus*
Spurdog	*Squalus acanthias*
Squat lobsters	*Munida spp.*
Thornback ray	*Raja clavata*
Thorny skate / Starry ray	*Amblyraja radiata*
Velvet belly	*Etmopterus spinax*
Whiting	*Merlangius merlangus*
White shark	*Carcharodon carcharias*
Witch	*Glyptocephalus cynoglossus*

1 EXECUTIVE SUMMARY

This report provides information on the assessment of the **Norway Skagerrak and Norwegian Deep cold water prawn fishery** for the client Norges Fiskarlag against the Marine Stewardship Council's Principles and Criteria for Sustainable Fishing v1.3. The assessment team used the default assessment tree as defined in the MSC Certification Requirements v1.3. The assessment process began in March 2015. The report is prepared by DNV GL.

1.1 Assessment timeline

Announcement of Initial Assessment:	26 March 2015
Site Visit and Stakeholder Consultation:	26-27 May 2015
Expected Date of Certification:	April 2016
The target Eligibility date:	1 November 2015

1.2 Scores for separate Principles

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species	80.6
Principle 2 – Ecosystem	80.3
Principle 3 – Management System	93.3

1.3 Main strength and weaknesses of the client´s operation

1.3.1 Strength

The attributes of the Norway Skagerrak and Norwegian Deep cold water prawn fishery that are helpful in achieving sustainability and thereby complying with MSC Principles and Criteria for Sustainable Fisheries are:

- Norway maintains a robust and effective control and surveillance regime, which ensures a high degree of compliance
- Assessment of stock status is based on a comprehensive range of fishery-dependent and fishery-independent data and is thoroughly peer-reviewed through a joint NAFO/ICES working group
- The mandatory use of sorting grids outside the 4nm baseline from the Norwegian coast is effective in minimizing the by-catch of all species.

- The fishery does not cause any (significant) mortality of ETP species e.g. whales, seals or birds and the effects on fish species are likely to be within limits of national and international requirements for protection of ETP species.

- The Norwegian authorities and the European Commission consult with all relevant stakeholder groups regarding new fisheries measures prior to their implementation.

1.3.2 Weaknesses

- No well-defined harvest control rules (HCRs) are in place which stipulate what management action will be invoked if the stock biomass declines to levels close to limit reference points.

- Insufficient data continue to be collected to detect any increase in risk to main by-catch species.

- Current regulations are not sufficient to provide a high likelihood that the fishery will not cause serious harm to coral gardens and deep sea sponge aggregations.

- There is insufficient basis for confidence that the strategy for the protection of habitats is achieving its objectives

- There is insufficient information on interactions of fishing operations with VME habitats

1.4 Draft determination with supporting rationale

The Norway Skagerrak and Norwegian Deep cold water prawn 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 Skagerrak and Norwegian Deep cold water prawn fishery for the client Norges Fiskarlag.

1.5 Conditions for certification and time-scale for compliance

The fishery achieved a score of below 80 against 5 performance indicators (PIs) – PI 1.2.2 Harvest control rules, PI 2.2.3 Information on bycatch species, PI 2.4.1 Outcome on habitats, PI 2.4.2 Management of the impact of the fishery on habitats and PI 2.4.3 Information on the risk posed to habitat types by the fishery. The assessment team has therefore set conditions for continuing certification that the client is required to address. The conditions are applicable to improve performance to at least the 80 level within the periods set by the DNV GL assessment team. A summary of conditions is given in paragraph 6.3. Full explanation of these conditions is provided in Appendix **1.2**.

2 AUTHORSHIP AND PEER REVIEWERS

2.1 Assessment team

Name	Role	Qualifications
Julian Addison	P1 and P2 expert, team leader	Julian Addison has 30 years' experience of stock assessment and provision of management advice on shellfish fisheries and scientific research on crustacean biology and population dynamics and inshore fisheries. Until December 2010 when he left the organisation to become an independent consultant, he worked at the Centre for Environment, Fisheries and Aquaculture Science (Cefas) in Lowestoft, England where he was Senior Shellfish Advisor to Government policy makers, which involved working closely with marine managers, legislators and stakeholders, Government Statutory Nature Conservation Organisations and environmental NGOs. He has also worked as a visiting scientist at DFO in Halifax, Nova Scotia and at NMFS in Woods Hole, Massachusetts where he experienced shellfish management approaches in North America. For four years he was a member of the Scientific Committee and the UK delegation to the International Whaling Commission providing scientific advice to the UK Commissioner. He has worked extensively with ICES and most recently was Chair of the Working Group on the Biology and Life History of Crabs, a member of the Working Group on Crangon Fisheries and Life History and a member of the Steering Group on Ecosystems Function. He has extensive experience of the MSC certification process primarily as a P1 team member but also as a P2 team member and team leader undertaking MSC full assessments for the Ireland and Northern Ireland bottom grown mussel fisheries, the Newfoundland and Labrador snow crab fishery, Estonia and Faroe Islands North East Atlantic Cold Water prawn fisheries, Swedish Skagerrak and Norwegian Deep cold water prawn fishery, the Eastern Canada offshore lobster fishery and the Limfjord mussel and cockle fisheries. He has also undertaken MSC pre-assessments, numerous annual surveillance audits and has carried out peer reviews of MSC assessments in both Europe and North America of lobster, cold water prawn, razorfish, cockle and scallop fisheries. Other recent work includes a review of the stock assessment model for blue crabs in Chesapeake Bay, USA, and an assessment of three Alaskan crab fisheries under the FAO-based Responsible Fisheries Management scheme. Julian has completed all requisite training and has signed all relevant forms for assessment team membership on this fishery.
Geir Hønneland	P3 expert	Dr Geir Hønneland is Research Director at the Fridtjof Nansen Institute in Oslo, Norway, and adjunct professor at the University of Tromsø, Norway. He holds a PhD in political science from the University of Oslo and has studied international fisheries management (with main emphasis on compliance issues), international environmental politics and international Arctic politics. Among his recent books are Arctic Politics, the Law of the Sea and Russian Identity (Palgrave, 2014), Making Fishery Agreements Work (Edward Elgar, 2012), International Environmental Agreements (Routledge, 2011), Arctic Politics and International Cooperation (Routledge, 2007) and Law and Politics in Ocean Governance: the UN Fish Stocks Agreement and Regional Fisheries Management Regimes (Martinus

		Nijhoff, 2006). He worked in the Norwegian Coast Guard from 1988 to 1994, where he was certified as a fisheries inspector. Geir also has a wide range of evaluation and consultancy experience, e.g. for the FAO and OECD, relating to responsible fisheries management. He has been involved in MSC assessments since 2009 (covering cod, haddock and herring fisheries in the Northeast Atlantic and krill in the Southern Ocean) and was certified as MSC Team Leader in 2014.
Sigrun Bekkevold	Responsible for Chain of Custody and DNV GL project manager	Sigrun Bekkevold is a principal consultant at DNV GL Business Assurance and holds a Master of Science in industrial chemistry and biochemistry from the Norwegian University of Science and Technology in Trondheim. She has 25 years of experience in leading projects for sustainable development of the marine sector. In the DNV GL she works with the MSC standard for sustainable fisheries as project manager and chain of custody responsible for pre-assessments, initial assessments and surveillance assessments. This includes e.g. Norwegian, Swedish and Danish shrimp fisheries in Skagerrak and the North Sea, Faroese and Estonian shrimps fisheries in the Barents Sea and Norwegian krill fishery in Antarctica. She has also been project manager in developing product certification standard for marine ingredients for Norwegian Food industry and has also working with strategies for sustainability services in the marine sector. Before 2012 her main focus was on research, innovation and business development within total utilization of fish. This includes compiling strategies, action plans, feasibility analysis and market analysis, organizing project teams, performing mass flow analysis, networking with industry, research and authorities, evaluating regulatory issues and communication of results. She held a position as a general manager in RUBIN Foundation, aiming for value adding and better utilization of fish by-products. RUBIN has been owned by the seafood industry in Norway and supported by Ministry of Fishery and Coastal Affairs and the Norwegian Seafood Research Fund. The work has included the whole value chain, from the fishing vessel and all the way to the Marked.

2.2 Peer reviewers

Name	Role	Qualifications
Hans J. Lassen	Peer reviewer 1	Hans Lassen is an independent consultant working with fisheries management, fisheries statistics and fish stock assessments. He started his career as researcher on computer simulations on chemical reactions, but has spent the last forty years focusing on the fishery sector. As a researcher and later principle senior scientist at Danish Institute for Fisheries Research / DTU he focused on fish stock assessment, computer simulations of ecosystems and fisheries statistics. Lassen has been head of ICES Advisory Programme (1998-2010) and Deputy and acting Director of Greenland Institute for Fisheries Research (now Greenland Nature Institute) (1988-1992). An important aspect of his work has been international cooperation. He has been member of numerous ICES assessment groups and chaired some of them, member of ACFM, responsible for interactions with industry and NGOs, and also been teaching fish stock

		assessment techniques internationally. Lassen has been part of the assessment team for two full assessments of fisheries against the MSC Principle and Criteria for sustainable fisheries; the completed assessment of the West Greenland coldwater prawn fishery and the ongoing assessment of the Greenland trawl fishery for cod, haddock and saithe in the Barents Sea.
Andrew Hough	Peer reviewer 2	Andrew Hough is a Marine Environmental Consultant. Andrew has PhD in marine ecology from the University of Wales, Bangor (1987-90). He has been involved in marine, coastal and freshwater environmental management since 1991, including management of fishery impacts on ecosystems and marine conservation biology, principally in European inshore waters. He was manager of the MSC CAB Moody Marine from 1999 to 2011 with particular responsibility for the implementation of MSC Certification procedures and development of MSC methodologies. He has acted as lead assessor on a large proportion of MSC pre assessments and main assessments during this time, and subsequently as team member and/or lead auditor for various assessments. This has involved stock assessment analysis, evaluation of ecosystem effects and management effectiveness of groundfish, pelagic and shellfish fisheries in various administrations around the world. He now works as a freelance environmental/fishery management consultant and auditor, consultancy projects include certification-related policy advice to the Association of Sustainable Fisheries.

3 DESCRIPTION OF THE FISHERY

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

3.1.1 Statement that the fishery is within the MSC scope

The assessment team confirms that the fishery under assessment meets the scope requirements, which are defined in MSC Certification Requirements Version 1.3, 14 January, 2013 (CR 27.4).

Principle 3, Criterion A1: The fishery is not conducted under a controversial unilateral exemption to an international agreement. Principle 3, Criterion B14: The fishery does not use destructive fishing practices such as poisons or dynamite.

3.1.2 Scope of Assessment in Relation to Enhanced Fisheries

This is not an enhanced fishery.

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

Northern shrimp (*Pandalus borealis)* is not an introduced species.

3.1.4 Scope of Assessment in Relation to Risk Based Framework (RBF).

The Risk Based Framework (RBF) is designed for use with the default assessment tree specifically with Principle 1 outcome PIs, but also Principle 2 outcome PIs, and was adopted by the MSC to enable scoring of fisheries in data-deficient situations. There are sufficient data available to estimate stock status for Northern shrimp and the impact of the fishery on ecosystem components (retained species, discarded species, ETP species, habitats and ecosystems). Therefore the Northern shrimp fishery under assessment is not considered a data deficient fishery and the use of the Risk Based Framework is not invoked in this assessment.

3.1.5 Unit of certification

The unit of certification is defined as:

Species:	Northern shrimp (*Pandalus borealis*)
Geographical range of fishing operations:	ICES Divisions IIIa and IVa East (Skagerrak and Norwegian Deep) in Norwegian and EU waters.
Method of capture:	Bottom trawl
Stock:	Northern shrimp in Skagerrak and Norwegian Deep
Management	The stock is managed according to EU-Norway agreement, Norwegian national management systems and advised by ICES.
Client group	All fishing operators targeting Northern shrimp (*Pandalus borealis*) in the ICES Divisions IIIa West and IVa East (Skagerrak and Norwegian Deep) using bottom trawl as harvesting method and operating under quota issued by authorities of Norway.

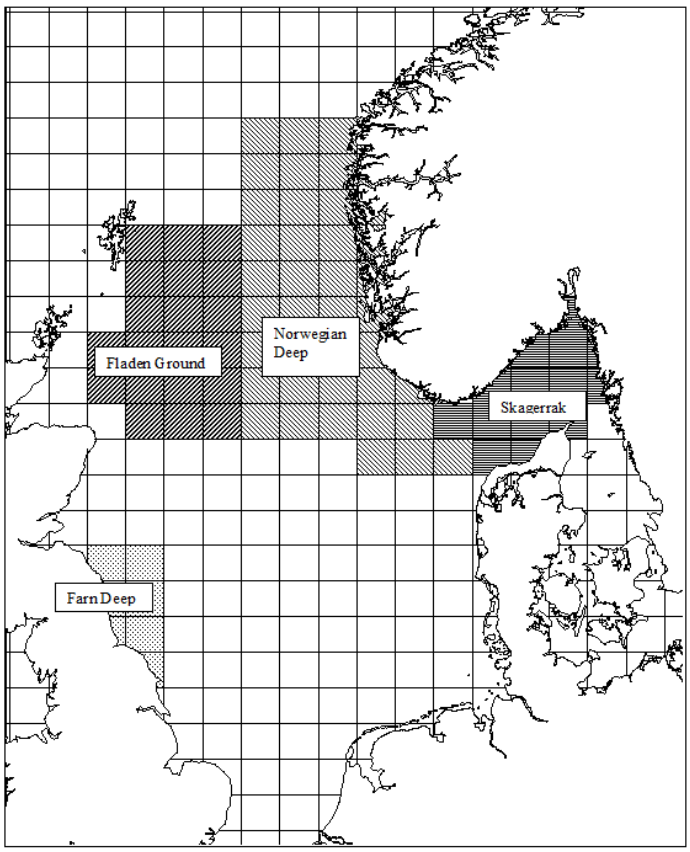


Figure 1. The distribution of *Pandalus borealis* stocks in the North Sea area including Norwegian Deep and Skagerrak assessment areas as defined by ICES squares.

(source: M. Ulmestrand et al. 2014)

3.1.6 Rationale for 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 V1.1 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".*

Rationale for choosing the unit of certification

The UoC covers all fishing operators targeting Northern shrimp (*Pandalus borealis*) in the ICES Divisions IIIa and IVa East (Skagerrak and Norwegian Deep, Figure 1) using bottom trawl as harvesting method and operating under quota issued by authorities of Norway.

3.1.7 Other eligible fishers

UoC covers all Norwegian fishing operators targeting Northern shrimp (*Pandalus borealis*) in the ICES Divisions IIIa and IVa East (Skagerrak and Norwegian Deep) using bottom trawl as harvesting method and operating under quota issued by authorities of Norway.

There are no other Eligible Fishers and the Certificate Sharing Mechanism is not applicable.

3.2 Overview of the fishery

3.2.1 Client name and contact information

Norges Fiskarlag
P.b. 1233 Sluppen
7462 Trondheim
Norway

Contact person:
Tor Bjørklund-Larsen
Mobile phone: +47 980 33 041
E-mail: tor.bjorklund.larsen@fiskarlaget.no

Norges Fiskarlag 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. Norges Fiskarlag'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 Norges Fiskarlag is its Congress, which consists of 69 delegates, elected by the seven county associations and two group organizations which together constitute Norges Fiskarlag. 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.

Norges Fiskarlag 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. Norges Fiskarlag 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
- Skagerrak and Norwegian Deep Cold Water Prawn

3.2.2 Client group

All Norwegian fishing operators targeting Northern shrimp (*Pandalus borealis*) in the ICES Divisions IIIa and IVa East (Skagerrak and Norwegian Deep, Figure 1) using bottom trawl as harvesting method and operating under quota issued by authorities of Norway.

The Norwegian shrimp fleet consists of multi-purpose fishing vessels trawling primarily in waters south of 60° North. A total of 203 vessels participated in the shrimp fishery in 2014 which is less than half of the number of vessels fishing 20 years ago. The majority of the vessels are between 10-14.99m in length. Since the mid-1990s, the number of trawlers less than 10m in length has decreased as has the number of vessels 11-20.99m, whereas there has been an increase in vessels of length 10-10.99m. The Skagerrak area of the fishery is characterised by a high number of small vessels under 15m, whereas the fleet in the Norwegian Deep area is more varied with a higher proportion of larger vessels (Søvik and Thangstad, 2014b).

3.2.3 History and general background of the fishery

The shrimp fishery in the Norwegian Deep and Skagerrak has been exploited by Norwegian and Swedish vessels since the end of the 19th century and by Danish vessels since the 1930s. The fishery expanded in the 1960s and by 1970 landings had reached 5,000 tonnes. In 1981 landings exceeded 10,000 tonnes after which landings fluctuated but steadily increased to a peak of around 16,000 tonnes in 2004 (Figure 2, Table 1). From 2004 to 2010 landings declined significantly, most likely due to poor recruitment, but are now showing signs of increasing particularly in the light of the 2014 recruitment index which is the highest level of recruitment in the recent time series (NAFO/ICES, 2014). Landings and estimated total catches by Norwegian vessels are shown in Table 1. The Norwegian shrimp fleet do not fish in the Kattegat and therefore the UoC is restricted to the Skagerrak and Norwegian Deep. The Danish fleet similarly does not fish in the Kattegat, but for the Swedish fleet, a very small component of the fleet's activity is undertaken in the westernmost area of the Kattegat, and consequently the Kattegat is included within the Unit of Certification for the Swedish fishery.

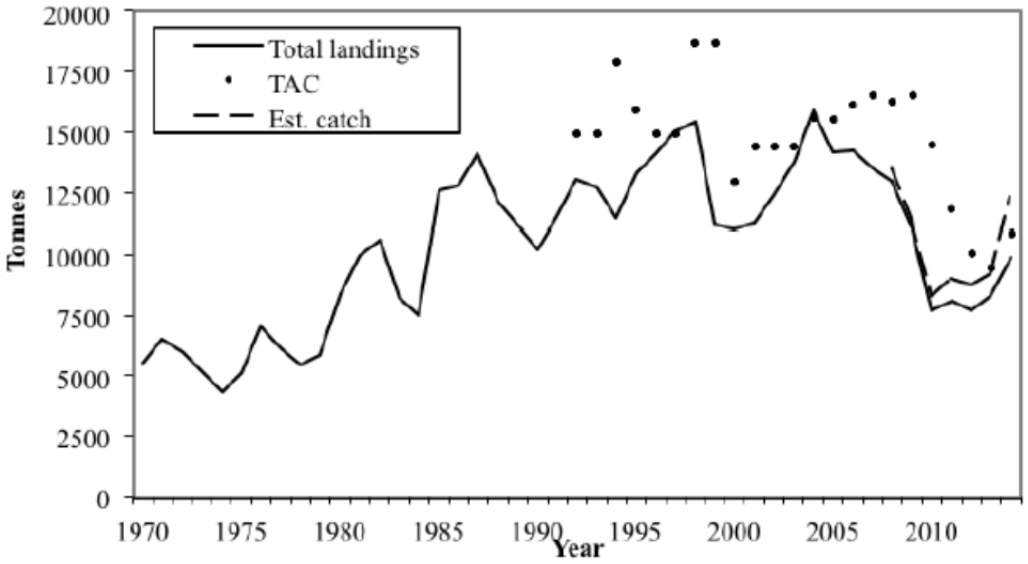


Figure 2. Northern shrimp in Skagerrak and Norwegian Deep: Total landings by all fleets, total catch including discards from 2008 to 2014, and TAC (source NAFO/ICES, 2015)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Recommended TAC	13.000	14.000	14.000	15.000	15.000	13.000	8.800	*	6.500	10.900
Agreed TAC	15.600	16.200	16.600	16.300	16.600	14.558	11.928	10.115	9.500	10.900
Denmark	2.992	3.111	2.422	2.274	2.224	1.301	1.601	1.454	2.026	2.432
Norway	8.959	8.669	8.686	8.260	6.364	4.673	4.800	4.796	5.179	6.124
Sweden	2.257	2.488	2.445	2.479	2.483	1.781	1.768	1.521	1.191	1.397
Total landings	14.208	14.268	13.553	13.013	11.071	7.755	8.168	7.771	8.379	9.953
Est. Swedish discards				540	337	386	504	671	265	572
Est. Norw. Discards					115	75	235	288	450	1.289
Est. Danish discards					36	53	123	92	185	526
Total catch	14.208	14.268	13.553	13.553	11.560	8.269	9.030	8.834	9.279	12.340

***Advice was to reduce catches in 2012**

Table 1. Northern shrimp in the Skagerrak and Norwegian Deep: TACs, landings and estimated catches. (source NAFO/ICES, 2015)

The Norwegian and Danish shrimp fleets have changed significantly over the last 25 years. In Norway the shrimp fleet has declined by more than 50% from 423 vessels in 1995 to 203 vessels in 2014, with more than half of the large vessels using twin trawls (Søvik and Thangstad, 2014b). Unstandardised catch rates (landings per unit effort, LPUE) from the Norwegian shrimp fishery are significantly higher for twin trawls than single trawls (Søvik and Thangstad, 2014b). In Denmark vessel numbers have decreased from 138 in 1987 to only 10 in recent years (Ulmestrand *et al*., 2014). Two vessels have recently left the fishery and in 2015 there are only 8 vessels in the fleet all of which now use twin trawls (Mikkel Knudsen, Launis Fiskekonserves A/S, pers. comm.). Twin trawlers have 40-80% higher catch rate compared with single trawls and trawls have increased in size in recent years in the Danish fishery. The Swedish shrimp fleet (defined as those vessels that catch more than 10 tonnes of shrimp per year) has decreased from more than 60 vessels in 1995-1997 to 33 vessels in 2014 (Ulmestrand *et al*., 2014). There has been little change in trawl design in Sweden, except that the percentage of landings from twin trawlers has increased from 7% to over 50% since 2006 (Ulmestrand *et al*., 2014).

Shrimp landed in the Skagerrak and Norwegian Deep fishery are separated into high value large shrimp boiled on board and smaller low value shrimp landed raw to the industry for further processing. In 2013 in the Norwegian fleet 43% of the landings were boiled shrimp and 57% raw fresh shrimp (Søvik and Thangstad, 2014b). Shrimp lose weight when boiled, and the fraction of the landings consisting of boiled shrimp is corrected using a conversion factor of 1.13 to obtain an estimate of fresh weight caught (Søvik and Thangstad, 2014b). In the Danish fleet, the majority of landings are of fresh raw shrimp, although the proportion of the landings that are boiled has been increasing in recent years (Ulmestrand *et al.*, 2014). In comparison the ratio of boiled to raw shrimp in the Swedish fishery has remained at 1:1 over the last few years (Ulmestrand *et al*., 2014).

The fishery has been managed through a TAC since 1992. The TAC reached 16,600 in 2007-2009, but has since been reduced, and was set at 9,500 for 2013 and 2014 (Figure 2, Table 1) and 10.900 for 2015. The TAC is shared amongst the three countries based on historical landings with Norway, Denmark and Sweden receiving 58-60%, 26-28% and 14% respectively in 2011-2015. The Norwegian annual quota is then sub-divided into three four-month periods January-April, May-August and

September –December with 40%, 30% and 30% respectively of the total annual quota. This allows supply to the market to be controlled and the Norwegian Directorate of Fisheries can close the fishery during any of these 4-monthly periods if the quota is reached. In addition to the overall quota within these 4-monthly periods, in 2014 vessels had an individual quota of 37 tonnes, 28 tonnes and 28 tonnes respectively in the three 4-monthly periods. Danish vessels have an individual vessel quota based on historical catches and may buy and sell quota amongst licence holders, and Swedish vessels have a monthly quota allocation, but this quota is not transferable between months.

ICES provides advice on TACs within a Maximum Sustainable Yield (MSY) framework and on the basis of precautionary considerations. ICES assumes that discard rates will be similar to rates observed in the last few years, and therefore advises on a maximum level of landings in addition to total catch (ICES, 2014; 2015). Discarding of shrimp in the Skagerrak and Norwegian Deep may occur because the shrimp are smaller than the commercial size of 15 mm carapace length (CL) or through high-grading which is the practice of discarding small to medium size low value shrimp and replacing with larger, higher value shrimp. High-grading is most likely to occur in fisheries where the TAC is restricting the activity of the fleet and when the vessel's skipper wishes to avoid the handling costs of low value catch . In Norway the landings (corrected for boiling) have varied between 54% and 97% of the Norwegian TAC over the period 2006 to 2013 (Søvik and Thangstad, 2014b) which would suggest that the TAC is not overly-restrictive of the activity of the fleet. However from time to time within-year landings have reached the 4-monthly TAC and the Directorate of Fisheries has had to close the fishery, suggesting that there is potentially some incentive to high-grade in the Norwegian fishery. Although high-grading may occur within the Norwegian fleet, it is not observed regularly (Modulf Overvik, Directorate of Fisheries, pers. comm.) In Denmark, catches have consistently been under the Danish TAC, and so there is no need for Danish vessels to undertake high-grading. The high proportion of the landings that are lower value fresh raw shrimp rather than higher value large boiled shrimp provides indirect evidence that high-grading is not occurring regularly in the Danish fishery. Ministry inspectors examine catch composition on vessels and have not observed any evidence of high-grading (Jacob Handrup, Danish AgriFish Agency, pers. comm.). In contrast the Swedish quota had previously been limiting the Swedish *Pandalus* fishery and in order to distribute landings over the year the fishers have voluntarily introduced rations per fisher per week. Since 2013, the Swedish Agency for Marine and Water Management (SwAM) took over the ration allocation from the Swedish fishers' organisation and a monthly allocation for each vessel (with permission to fish *Pandalus*) was decided. The monthly rations are based on historical landings (2005-2010) and are not transferable between months. These individual monthly vessel quotas can be smaller than the vessels' fishing opportunities in a given month with the result that smaller shrimp are discarded.

Observer sampling of total catch composition has been carried out by both Danish and Swedish scientists under the European Commission's Data Collection Framework (DCF). Discard rates in the Danish fleet based on observer data were estimated at between 2 and 8% of the total catch in 2008-2013, but increased to 18% in 2014. The discard rate in the Swedish fleet was between 12 and 31% from 2008-2014. There are no observer data for the Norwegian fleet, so Norwegian discards in the Skagerrak are estimated by applying the Danish discards to landings ratio to Norwegian landings, and in the Norwegian Deep where no observer data are available, discarded shrimp are assumed to be primarily shrimp under 15 mm CL and are estimated from length distributions of the catch. The overall estimated discard rate by weight for the three fleets combined was 12% in 2012, 10% in 2013, and 19% in 2014 although the proportion of large boiled shrimp in the Norwegian landings is larger than in the Danish landings (see above) suggesting that there is some uncertainty surrounding the estimate of discard rate in the Norwegian fleet (NAFO/ICES, 2015; Munch-Petersen et al., 2013; Søvik and Thangstad, 2014b). A multi-agency project, the NORDEN project, is currently researching methods of reducing catches of small

shrimp. Initial results from the project are very encouraging; experimental fishing using a mesh size of 47mm instead of the standard 35 mm mesh shows a significant reduction in the capture of small shrimp, particularly in the "lus" (very small) category. Work within the project is currently focussing on the efficiency of different types of grid in reducing the capture of small shrimp (Bengt Gunnarsson, Gothenburg Fish Auction, pers. comm.). In addition, the Norwegian Ministry of Industry and Fisheries introduced new legislation in 2015 to implement real time closures (RTCs) in areas where the catch rates of small shrimps is high and has increased the minimum landing size to 7 cm total length.

The primary management regulation in the fishery has been the TAC. Initially the TACs were based on catch predictions from a cohort-based analytical assessment, but following the discontinuation of that assessment method, the TAC was based on perceived stock development in relation to recent landings until 2013 after which the assessment was based on a stock production model (NAFO/ICES, 2015). Whilst there is no formally agreed harvest control rule (HCR) for this fishery, the TAC is implicitly modified therefore in response to the annual stock assessments undertaken by the NAFO / ICES *Pandalus* assessment group (NIPAG).

In addition to the TAC, management measures include a minimum mesh size of 35mm (although most vessels voluntarily use a larger mesh size to reduce the catch of undersized shrimp), restrictions in the amount of landed by-catch which vary between fleets and the mandatory use of a grid with a maximum bar spacing of 19mm in the fishery in the Skagerrak outside the Norwegian 4nm boundary. In January 2015, the mandatory use of a sorting grid was extended to cover the fishery in the Norwegian Deep, although many vessels were already using the grid in this area. In Denmark and Sweden there is restricted entry licensing, but in Norway the vessels may fish for multiple species and so there is no limit on the number of small (<11m length) vessels entering the fishery as the exploitation rate is limited by individual vessel quotas. In Norway there is also a minimum landing size of 15mm CL (equivalent to 6 cm total length), maximum bycatch limits, and regulation J-128-2011 requires that "collisions" between fishing gear and corals and sponges (defined by 60 kg corals or 800 kg of sponges in a haul) must be recorded and "move-on" rules apply. In the Norwegian fleet, fishing activity is monitored through VMS for larger vessels (>12m length in the Skagerrak and >15m length in the North Sea). Log book coverage in the Norwegian fleet was poor historically, with vessels < 11m length not required to complete log books, but now all vessels fishing in the Norwegian Deep >15m length and all vessels fishing in the Skagerrak >12m length complete electronic log books for each haul of the trawl. In 2013, 73% of the total landings in the North Sea and 54% of total landings in the Skagerrak came from vessels completing log books, and so LPUE data are available for a representative proportion of the fleet. Scientists also collect log book data from four representative small vessels fishing in the Skagerrak, and for vessels between 13 and 15m length fishing in the North Sea, a new regulation was introduced on 1 February 2015 that catches must be recorded using an "app" on their mobile telephones and submitted prior to landing. This method of recording catches will replace the manual recording on log books and will also provide fishing location in a similar way to VMS on the larger vessels. All vessels irrespective of size must declare their landings of all species and produce sales slips, so the information on landings from the fleet is complete. Landings of shrimps recorded on log books or the mobile app must be within 10% of the actual landings recorded at the point of landing. All Danish vessels are >20m in length so all have VMS on board, and all vessels have electronic log books recording position and catch data on a haul-by-haul basis. All vessels in the Swedish fleet have VMS and complete log books.

Whilst there is a series of management measures in place for the shrimp fishery in the Skagerrak and Norwegian Deep, there is currently no formal management plan agreed between the nations that participate in the fishery. The NIPAG meeting held in Nuuk, Greenland in September 2014 reported that

Norway has taken the first steps in developing a management plan for the shrimp stock in Skagerrak and Norwegian Deep, and intends to solicit cooperation from the EU in relation to the Danish and Swedish fleets (NAFO/ICES, 2014). During the Fisheries Consultations between the EU and Norway on the regulation of fisheries in Skagerrak and Kattegat in 2015 held in Ireland in December 2014, the Delegations agreed to continue developing a management strategy for shrimp during the first quarter of 2015. It is being led by Norway working alongside their EU counterparts in Denmark and Sweden and in conjunction with Norwegian scientists at IMR in Bergen. The management plan including a scientific evaluation is likely to be completed in 2015/16, following which it will be signed by the respective delegations from the EU and Norway (Ann Kristin Westberg, Norwegian Ministry of Trade, Industry and Fisheries, pers. comm.). At a meeting in Lofoten Islands, Norway in May 2015, the EU-Norway consultations considered a proposal by Norway to request ICES advice on various components of a joint management plan including a TAC determined by an explicit harvest control rule, in-year revisions of the TAC based on the January stock survey, inter-annual quota flexibility, and the sensitivity of TAC calculations to uncertainty about discard rates. No agreement was reached at the meeting on the request to ICES for advice, and the joint management plan remains therefore under development (Geir Ervik, Norwegian Ministry of Trade, Industry and Fisheries, pers. comm.). However Norway did unilaterally submit a request to ICES for advice on the issues outlined above, and the NIPAG working group provided an initial response in its 2015 report (NAFO/ICES, 2015).

3.2.4 Fishing practices and gear used

A typical Norwegian trawler fishing for shrimps in the Skagerrak is shown in Figure 3. Shrimp trawlers use an otter trawl net, which is held open by trawl doors. An increasing number of Norwegian vessels use twin trawls and in 2011-2014 twin trawls were used by more than half of the trawlers larger than 15m (Søvik and Thangstad, 2014b). Twin trawls use a clump in the middle to keep the net near the bottom. The weight of the doors is between 0.5 and 1.0 tonnes and the weight of the clump is around 1.0 to 2.0 tonnes. The ground rope is prevented from making contact with the sea bottom primarily by plastic bobbins of 20 cm in diameter. The minimum mesh size in this fishery is 35 mm, although many vessels voluntarily use a 40 to 45 mm mesh size in order to avoid catching very small shrimp. Shrimp fishing occurs throughout the year in depths of 100 to 500 m. Most vessels fish both within and outside the 4nm Norwegian baseline.

The standard trawl may have significant by-catch other than *Pandalus borealis*, and all vessels in the UoC use a Nordmore selective grid incorporated into the standard trawl to target shrimps providing a relatively clean catch of shrimp with very little by-catch (Figure 4). The Nordmore grid has a bar spacing of 19mm which excludes the capture of fish that are approximately 20 mm or more and has been shown to reduce by-catch significantly (Richards and Hendrickson, 2006; Isaksen and Solvdal, 1997, SLU observer data for 2011/2012 presented in DNV, 2015). Under the EU–Norway agreement, the selective grid is mandatory for all vessels in the Skagerrak, except within 4nm of the Norwegian coastline. In January 2015, the mandatory use of a sorting grid was extended to cover the fishery in the Norwegian Deep, although many Norwegian vessels were already using the grid in this area and inside the 4nm baseline. If vessels have a fish quota, then within the grid trawl they are permitted to use a fish retention device or “tunnel”, a 120mm square mesh tunnel at the grid’s fish outlet. The tunnel retains larger commercial fish, but may also prevent the escape of non-commercial species.

Fishing gear used in the shrimp fishery and the catch compositions may be the subject of inspection by the Coastguard in each country. The Norwegian Coastguard conducted a total of 41 inspections of vessels fishing for shrimp in the North Sea and Skagerrak, and the regional branch of the Norwegian

Directorate of Fisheries carried out 19 inspections of shrimp vessels between January 2014 and April 2015 (Modulf Overvik, Directorate of Fisheries, pers. comm.) The Danish Coastguard carries out inspection of shrimp vessels, but only a few inspections every year because most Danish fishing activity occurs in Swedish or Norwegian waters. However some Swedish inspections are undertaken as joint operations with Danish fisheries inspectors on board the Swedish inspection vessels (Jacob Handrup, Danish AgriFish Agency, pers. comm.). In Sweden in 2013 and 2014, the Coastguard carried out 28 inspections (target 25) and 40 inspections (target 30) of shrimp vessels respectively (Andreas Jonsson, Swedish Coastguard, pers. comm.). Following a joint Swedish Government commission in 2014 to review the control of the shrimp fishery and to develop a common approach to controls, the Swedish Coastguard issued new instructions on 16 March 2015 for the inspection of shrimp vessels.

Figure 3. Typical Norwegian shrimp trawler fishing in the Skagerrak.

(source: Geir Nordstrand, MarineTraffic.com)

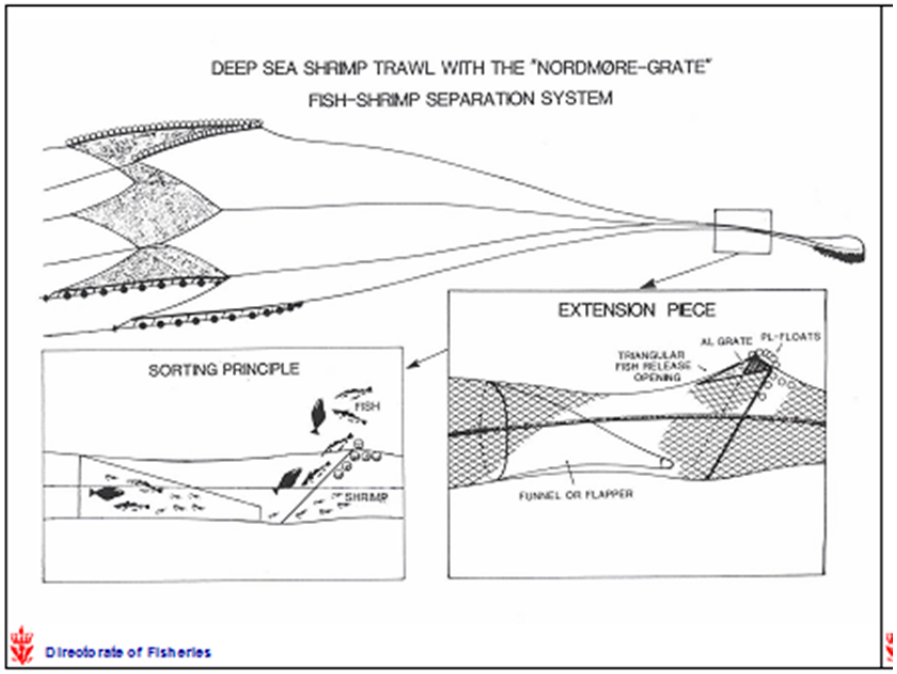


Figure 4. Diagram of sorting grid used in the fishery.

(Source: Norwegian Directorate of Fisheries)

3.3 Principle One: Target Species Background

Principle 1 of the Marine Stewardship Council standard states that:

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.

In the following section the key factors which are relevant to Principle 1 are outlined.

3.3.1 Taxonomy and geographic range

The cold water prawn *Pandalus borealis* (Krøyer, 1838), also known as the pink or northern shrimp, is a caridean shrimp of the family Pandalidae. It is distributed across the North Atlantic around the Barents Sea, Svalbard, Iceland and Greenland and south to the North Sea and Massachusetts, and across the North Pacific from the Bering Sea south to Japan and Oregon (Holthuis, 1980). The Skagerrak represents one of the warmest parts of the species' range. In all these areas there are important commercial fisheries for *Pandalus borealis*.

3.3.2 Stock Structure

As noted above, *Pandalus borealis* is distributed widely across the North East Atlantic, and within the North Sea for management purposes ICES currently considers that shrimps from the Farn Deeps, Fladen Ground and the Norwegian Deep/Skagerrak belong to three separate stocks based on geographic locations and ocean currents and differences in length frequency distributions between the areas. Life history characteristics of *P. borealis* suggest that there is likely to be some connectivity between populations within the main fishing areas. Migration of egg-carrying females into shallower waters in connection with egg-hatching has been observed (Horsted, 1978), juveniles may migrate from shallower to deeper water (Smidt, 1981), and particle tracking models reveal that the larvae of *P. borealis* may be transported as far as 300km during the pelagic phase (Pedersen *et al*. 2003). Studies of genetic structure of *P. borealis* in the North East Atlantic confirm that there is little genetic difference between populations over wide geographical areas. Martinez *et al*. (2006) analysed variation in the genomic DNA by random amplified polymorphic DNA (RAPD) markers, and concluded that the populations of the Barents Sea and Svalbard can be considered to be a single population. A recent study by Knutsen *et a*l. (2014) using microsatellite DNA analyses showed that spatial genetic structure among oceanic samples from the Skagerrak and eastern North Sea was weak and non-significant. However there was some clear genetic differentiation between samples from the Skagerrak fjords and the oceanic samples. Knutsen *et al*. (2014) concluded that the lack of genetic differentiation between oceanic samples coupled with information on 30 years of survey and commercial catch data is consistent with the current management assumption that the shrimp fishery in the Norwegian Deep and Skagerrak is a single stock. Genetic and time-series data together with ocean current information suggests that the Fladen Ground shrimp constitute a separate population from both Norwegian Deep and Skagerrak shrimp (Knutsen *et a*l. 2014).

3.3.3 Biology and Life Histories

Northern shrimp (*Pandalus borealis*) is a cold water species living on soft mud or sand/silt on the continental shelves in the North Atlantic, usually at depths between 50 and 500 m (Shumway et al., 1985). *P. borealis* is a protandric hermaphrodite (Bergstrøm, 2000). Individuals start out as males,

mature as males and mate for two years but, after about 3 to 4 years they change sex and complete their lives as females (NAFO/ICES, 2010), although in the relatively warm waters of the Skagerrak and Norwegian Deep, shrimps will change sex at about 18-20 mm in age group 2 (Sten Munch-Petersen, DTU Aqua, pers. comm.) In Skagerrak and the North Sea, spawning and mating takes place in October/November and females carry the fertilized eggs under the abdomen until hatching takes place in March the following year (Bøhle, 1977). The species has five pelagic larval stages which drift with ocean currents for 45–90 days depending on the ambient sea temperature before settling on the bottom (Aschan and Ingvalsen, 2009; Shumway et al., 1985). Particle tracking models reveal that the larvae of *P. borealis* may be transported as far as 300km during the pelagic phase (Pedersen *et al*. 2003). Shrimp feed both on the ocean floor and in the water column. Their diet will therefore include both benthic and pelagic organisms. Recruitment of one year old shrimp appears to be dependent on spawning stock biomass, but it may also be affected by the timing and duration of the phytoplankton bloom (Aschan and Ingvalsen, 2009). Recruitment to the fishery when the shrimps are greater than 15 mm carapace length (6 cm total length) is influenced by temperature, competition with other species and predation.

Numerous fish and marine mammal species are predators of *P. borealis* (Parsons, 2005) and predation mortality is thought to be an important factor in shrimp stock dynamics (Sten Munch-Petersen, DTU Aqua, pers. comm.), although predator abundance varied little over the last ten years in the Skagerrak and North Sea ecosystem (NAFO / ICES, 2015) and and so it is not possible to ascertain how the shrimp stocks will respond to large variations in predator abundance.

3.3.4 Status of stocks

For management purposes *Pandalus borealis* in the Skagerrak and Norwegian Deep is assumed to constitute a single stock and this assumption is confirmed by recent genetic studies (Knutsen et al., 2014). The shrimp stock in the Skagerrak and Norwegian Deep area (ICES Divisions IIIa and IVa East) is assessed annually along with other Northwest Atlantic Fisheries Organization (NAFO) and International Council for the Exploration of the Sea (ICES) stocks by the joint NAFO/ICES *Pandalus* Assessment Group (NIPAG).

3.3.4.1 Stock assessment methods

The stock assessment of shrimps in the Skagerrak and Norwegian Deep underwent an ICES Benchmark from 2011 to 2013. The aim of benchmarking is to reach a consensus agreement on an assessment methodology that is to be used in future assessments and the process is reviewed by independent experts and is open to stakeholders. The main objectives of the Benchmark were to establish the genetic basis for the unit stock and to select an appropriate assessment method for providing information on the past and present state of the stock, reference points and projections. The benchmark evaluated two assessment models - a stochastic length-based assessment model (Neilson *et al*., 2013) and a Bayesian surplus production model (Hvingel, 2014). Both models were evaluated as capable of delivering a full analytical assessment, but the preferred model was the analytical length-based model as it applies more detailed biological information in the assessment and therefore provides more immediate responses to change (ICES, 2013). Nevertheless the Benchmark advised that the surplus production model should still be used initially to provide verification on the performance of the length-based model. In 2013, the length-based model was not fully operational to produce sufficient output for the ICES advice and in 2014, various inconsistencies were identified in the fitting of the model, and so the advice in 2014 was based on the surplus production model. In 2015 both models produced full assessment outputs and were considered in parallel (NAFO/ICES, 2015). Both models gave similar results in terms of estimating biomass but diverged in estimates of recent F values and in the evaluation of stock status

in relation to reference points and hence in derived advice. Despite substantial development of the length-based model, some inconsistencies were identified still in the fitting of the model, and NIPAG decided to use the stock-production model as the primary basis for advice in 2015 and to use the length-based model for supportive information (NAFO/ICES, 2015).

The stock assessment model used by NIPAG as the basis for advice is a stochastic version of a surplus production model. The model is formulated in a state-space framework and Bayesian methods are used to derive posterior likelihood distributions of the parameters (Hvingel and Kingsley, 2006). The surplus production model synthesises information from input priors including initial biomass ratio, carrying capacity and survey catchability, a series of shrimp catches, and four independent series of shrimp biomasses (Hvingel, 2015).

Total reported catch from all vessels in the fishery from 1970 to 2014 is used as yield data. The four series of shrimp biomasses are two series of standardised annual commercial catch rates from Danish (1987-2014) and Norwegian (2000-2014) vessels and two Norwegian trawl survey biomass indices from 1984-2002 and 2000-2015. ICES has stated that "Making the electronic logbooks introduced in the Norwegian fishery in 2011 compulsory for all vessels, instead of only the larger ones, would improve the data available for the assessment." The assessment team notes however that an increasing proportion of the fishing activity of the Norwegian fishing fleet is covered by log books, and Søvik and Thangstad (2014b) show that in 2013 most of the landings in the Norwegian Deep and about 50% of the landings in the Skagerrak are recorded in log books. These log books are considered to provide representative indices of LPUE even though the whole fleet is not covered. Although log book records on catch and effort are not completed by all Norwegian vessels, all vessels must make landings declarations, so data on landings from the Norwegian fleet are complete.

Standardised LPUE calculated from Danish, Norwegian and Swedish catch and effort data from log books (Søvik and Thangstad, 2014b; Ulmestrand *et al*., 2014) increased from 2000 to 2007, declined until 2012, and all three series have increased since 2013 (Figure 5). (Note that only Danish and Norwegian data are used in the assessment model.) Standardized effort has been fluctuating without trend since the mid-1990s (Figure 6).

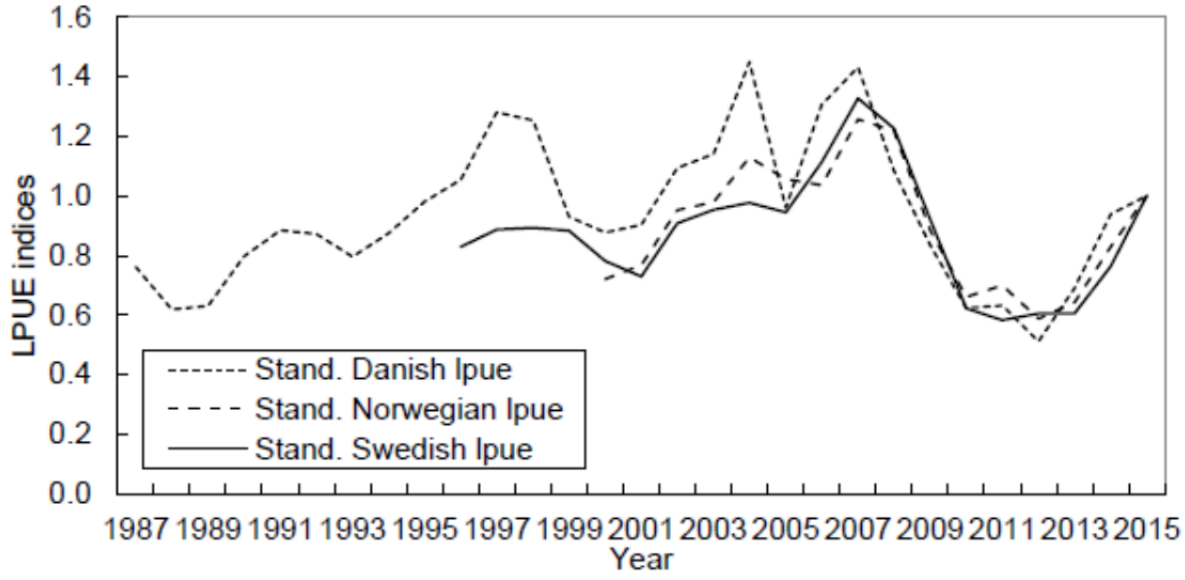


Figure 5. Northern shrimp in Skagerrak and Norwegian Deep: Danish, Norwegian and Swedish standardized LPUE. 2015 data are preliminary. Each data series is standardized to its final year. Source: NAFO/ICES 2015

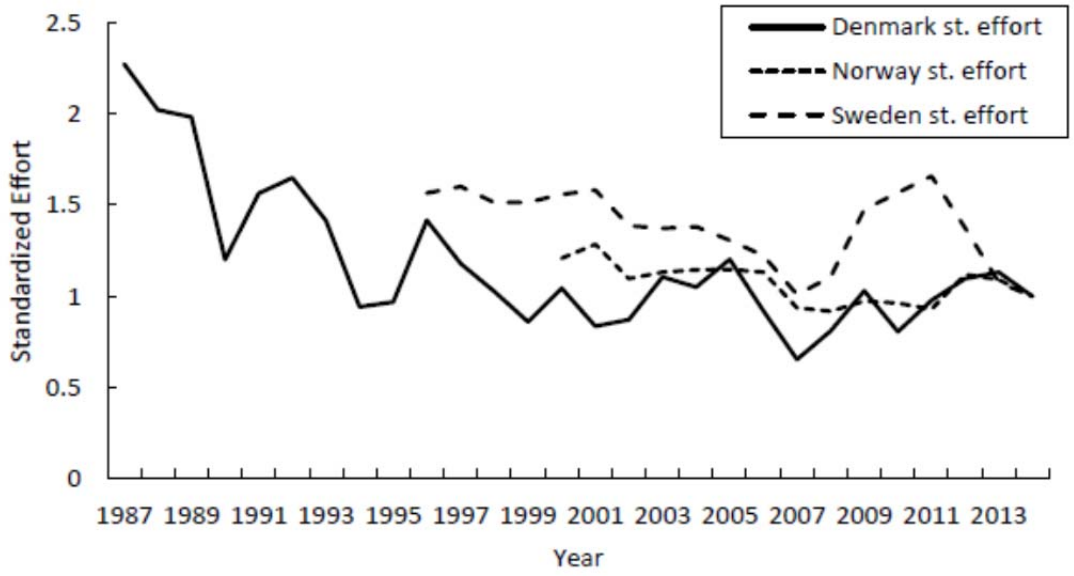


Figure 6. Northern shrimp in Skagerrak and Norwegian Deep: Estimated standardized effort. Each data series is standardized to its final year.

Source: NAFO/ICES 2015

Due to large changes in vessel, gear and timing in 2003-2006, Norwegian survey data provide four indices of biomass (Søvik and Thangstad, 2014b), although series 2 comprises a single point in 2003. Biomass estimates from the survey peaked in 2007, declining to a minimum in 2012, but has since shown an increase (Figure 7).

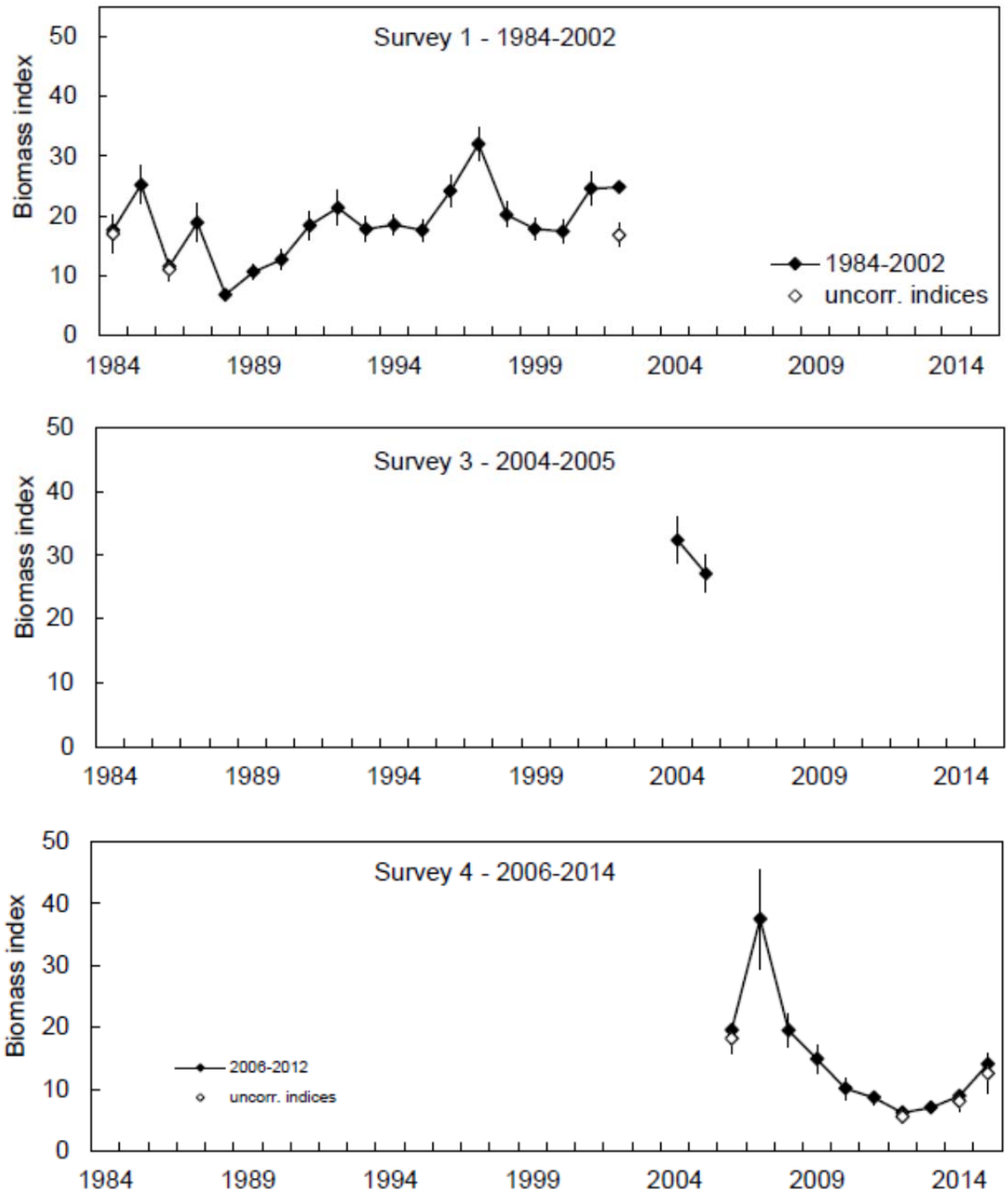


Figure 7. Northern shrimp in Skagerrak and Norwegian Deep: Estimated survey biomass indices in 1984 to 2014. For more details see NAFO/ICES, 2015. Source: NAFO/ICES 2015

The recruitment index (abundance of age 1 shrimp) estimated from the Norwegian stock survey declined from 2007 to 2010, increased in 2011 and 2012, declined slightly in 2013, but was at the highest level in the time series in 2014 (Figure 8). In 2015, the abundance of age 1 shrimp was again low. As there is a good correlation between abundance of age 1 shrimps in year t with age 2 shrimps in year t+1 and age 3 shrimps in year t+2, the high recruitment index in 2014 indicates that the recent observed increase in stock biomass will continue in future years (Søvik and Thangstad, 2014b). The spawning

stock biomass (SSB) index, calculated as the number of berried females, follows the same trend as the total biomass index . There appears to be no relationship between SSB and recruitment (Søvik and Thangstad, 2014b).

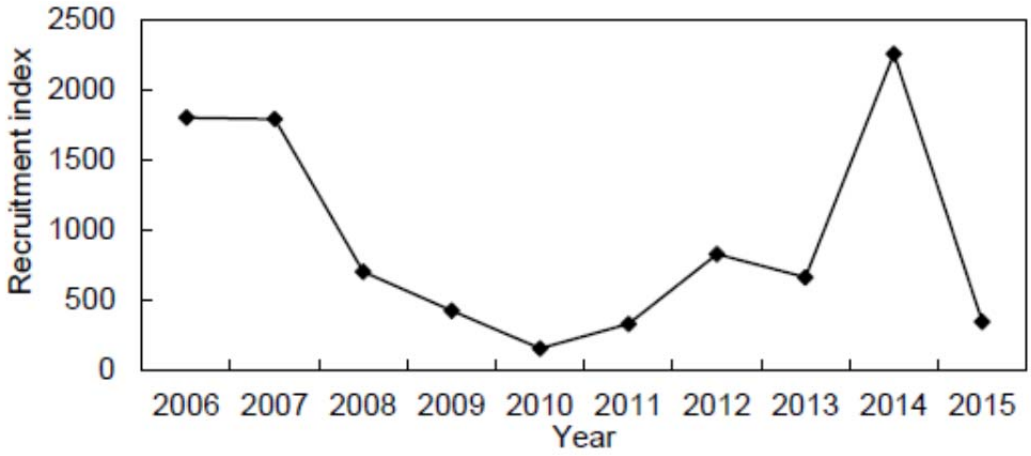


Figure 8. Northern shrimp in Skagerrak and Norwegian Deep: Estimated recruitment index from Norwegian stock surveys from 2006-2015.

Source: NAFO/ICES 2015

Length frequencies of the catches from 1985 to 2014 have been obtained by sampling. The samples also provide information on sex distribution and maturity. Numbers at length are input data to the newly developed length-based analytical assessment model for this stock (NAFO/ICES, 2015).

Although predation is an important source of mortality for shrimp, predator abundance indicators varied little over the last ten years of surveys (NAFO/ICES, 2015) and predator abundance was found not to hold any information regarding shrimp stock dynamics (Hvingel, 2005). As it is not possible to ascertain how the Skagerrak /North Sea shrimp stocks will respond to large variations in predator abundance based on currently available information , predation was not included as an explicit variable in the assessment model (Hvingel, 2015).

3.3.4.2 Reference points

In addition to estimating Bmsy, the biomass that would yield Maximum Sustainable Yield (MSY), and Fmsy, the fishing mortality at MSY, the assessment also considers two other reference points that ICES uses within its MSY framework for providing advice: Btrigger, a biomass encountered with low probability if Fmsy is implemented, and set by NIPAG at 50% of Bmsy corresponding approximately to the 10th percentile of the Bmsy estimate, and Blim (30% of Bmsy), the biomass below which recruitment is expected to be impaired. The assessment also considers Flim (170% of Fmsy), the fishing mortality that would drive the stock to Blim.

3.3.4.3 Results of assessment

The surplus production model was fitted by Bayesian methods using fishery catch and effort data and Norwegian trawl survey data. Absolute biomass estimates have relatively high variances, and therefore to cancel out the uncertainty of the catchability parameters (which scale biomass indices to real biomass), in the assessment model shrimp biomass (B) is measured relative to Bmsy, and the fishing mortality (F) is scaled to Fmsy. The time series of relative biomass estimated from the model shows that the stock biomass has been above MSY Btrigger since the early 1990s (Figure 9). Stock biomass

declined between 2006 and 2011, but has increased from 2011 to 2015, and the 2015 median estimate is well above Bmsy (Table 2). The median estimate of fishing mortality has remained below Fmsy since the early 1990s (Figure 10).

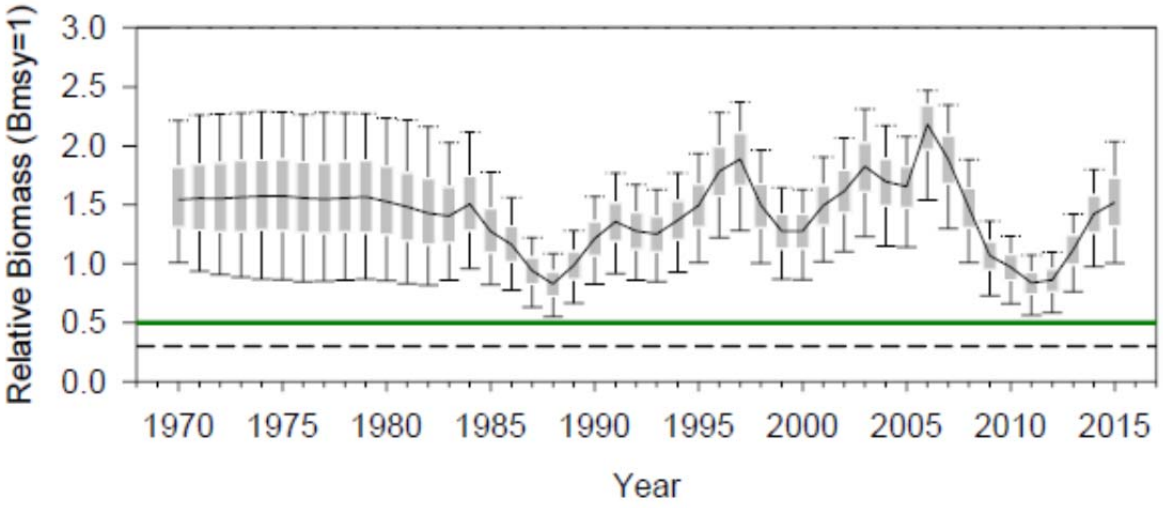


Figure 9. Estimated time series of relative biomass (B/Bmsy). Solid black line is the median estimate, boxes represent quartiles, and the whiskers cover the central 90% of the distribution. Dashed black line represents Blim, and the solid green line represents MSY B trigger (Source: NAFO/ICES 2015)

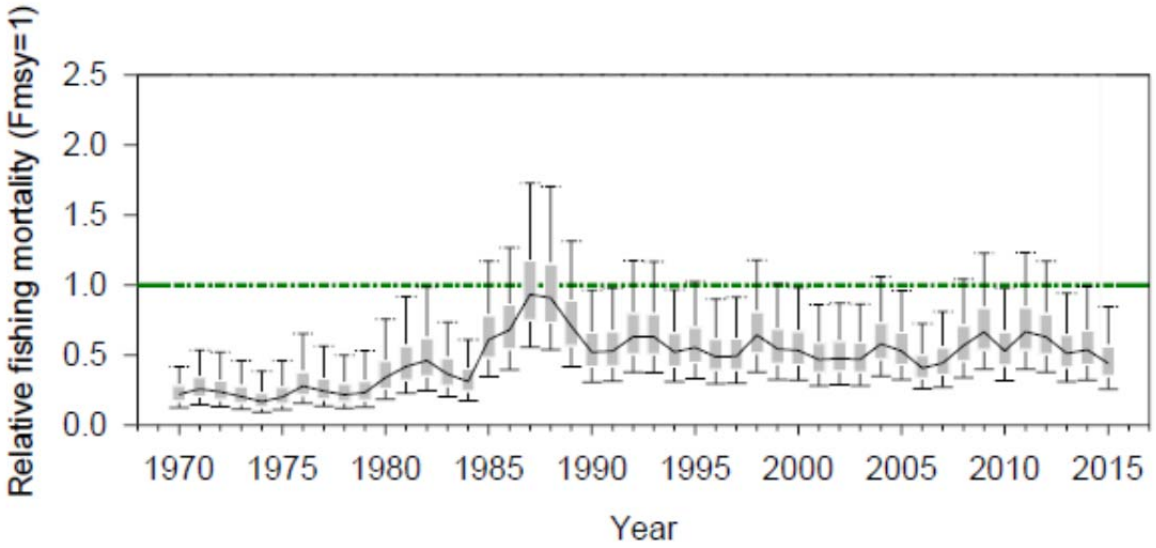


Figure 10. Estimated time series of relative fishing mortality (F/Fmsy). Solid black line is the median, boxes represent quartiles, and the whiskers cover the central 90% of the distribution. Green line represents Fmsy. (Source: NAFO/ICES 2015)

Status	2014	2015*
Risk of falling below B_{lim} ($0.3B_{MSY}$)	0%	0%
Risk of falling below *Btrig* ($0.5B_{MSY}$)	0%	0%
Risk of exceeding F_{MSY}	5%	2%
Stock size (B/Bmsy), median	1.41	1.50
Fishing mortality (F/Fmsy), median	0.54	0.44
Surplus production (% of MSY)	84%	75%

*Predicted catch = TAC

Table 2. Risk analysis of stock and fishing mortality exceeding reference points.
Source: NAFO/ICES 2015

The assessment estimates the risk associated with exceeding the various reference points. In 2015, the risk of stock biomass falling below Btrigger and Blim is 0% and the risk of fishing mortality exceeding Fmsy was 17% (Table 2). Plots of annual relative biomass against annual relative fishing mortality estimated by the model confirm that throughout the history of the fishery, the stock has remained above MSYBtrigger, and that for many of those years the stock has been above Bmsy (Figure 11). Apart from two years, fishing mortality has remained below Fmsy. The assessment also provides model predictions of risk associated with a range of catch levels in 2016 from 14,000 to 24,000 tonnes per annum assuming a catch in 2015 of 10900 tonnes (TAC). For all options, the risk of stock biomass falling below both Blim and Btrigger is 0%. Catch options of up to 20,000 tonnes have a less than 50% risk of exceeding Fmsy.

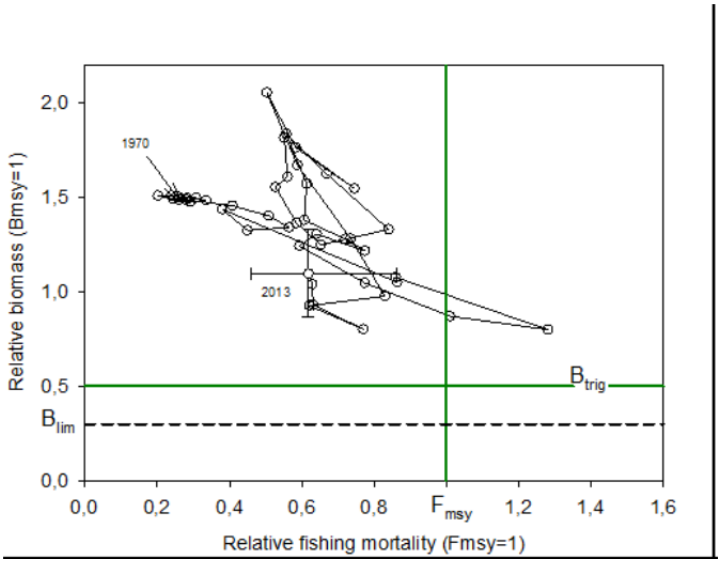


Figure 11. Annual median estimates of relative biomass and relative fishing mortality from 1970 to 2014. Btrigger and Fmsy are denoted by green lines and the dotted line represents Blim. [Authors' note: 2015 update not yet available] (Source: Hvingel, 2014)

The alternative length-based model presented at the NIPAG meeting in 2014 has now undergone further development including the calculation of conventional reference points. The assessment using the length-based model estimates that spawning stock biomass has declined significantly since 2006, reaching its lowest value in the time series in 2014, but increasing significantly in 2015 (Figure 12). Estimates of recruitment are low from 2009 to 2015, with exception of the very high recruitment in 2014. However the uncertainties around the estimate of recruitment in 2015 were very large, because the

model has seen the recruits only in the survey data and not yet in the fishery data (NAFO/ICES, 2015, Figure 12). Estimates of fishing mortality have remained relatively stable from the early 1990s to 2010, but then have increased sharply to a very high level in 2015. Whilst such an increase in fishing mortality is consistent with estimates of harvest rates, it is not consistent with recent trends in fishing effort.

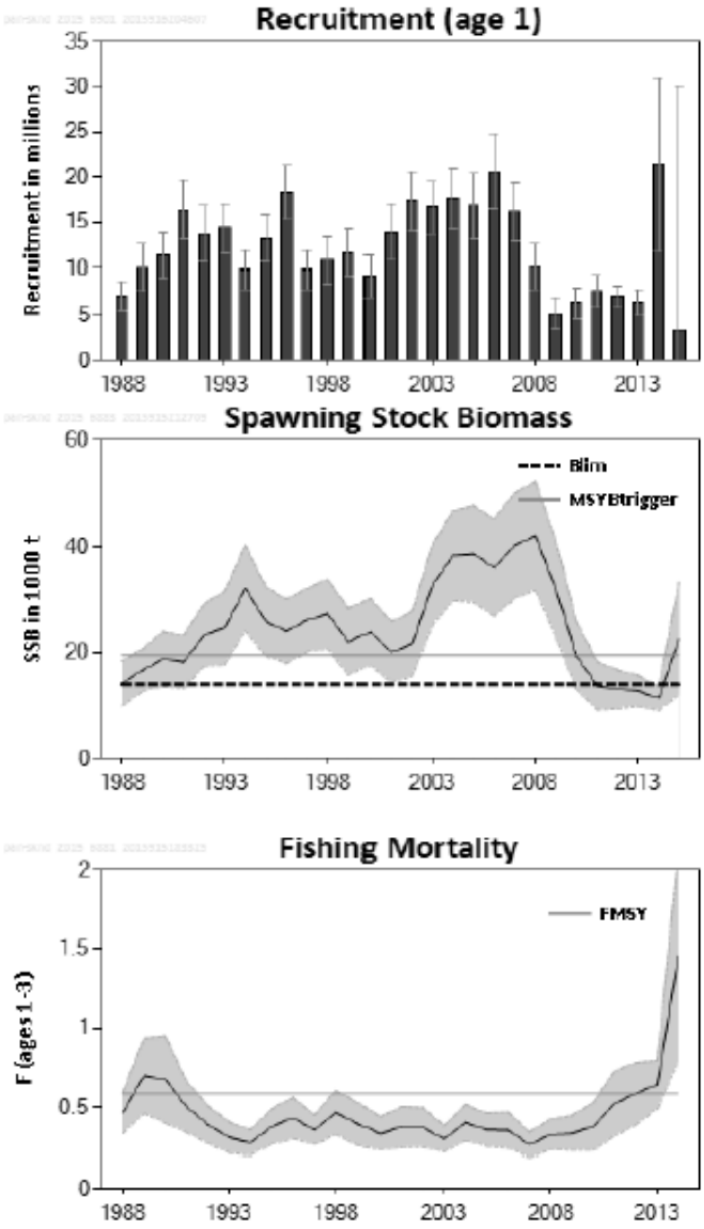


Figure 12. Summary of the stock assessment of the length-based model – estimates of recruitment, spawning stock biomass (SSB) and fishing mortality. The 2.5% and 97.5% quartiles are included for each time series. **(Source: NAFO/ICES, 2015)**

Whilst there is general agreement from the two assessment models that stock biomass has recovered recently following a significant decline, there are some clear differences between the outcomes of the two assessment models presented at the NIPAG meeting. The length-based model estimates that there has been a significant recent increase in fishing mortality which is not evident from the output of the surplus-production model, and the length-based model estimates stock biomass to be much lower than

that estimated from the surplus-production model. At its meeting in September 2015, NIPAG reviewed the performance of the length-based model, and identified some retrospective pattern in the estimates of fishing mortality and that the model frequently under-estimates peaks in the survey observations of the youngest age-classes, possibly due to incorrect definitions of growth rate or incorrect modelling of selectivity. The model was also subject to an independent peer-review in September 2015 which identified several inconsistencies which require further investigation. Based on their own investigation and that of the independent peer reviewer, NIPAG concluded that the length-based model needs further exploration on alternative growth rate, selectivity and natural mortality assumptions before it can be used as the basis for advice. Nevertheless the significant differences in outcome between the length-based model and the surplus production model presented in the NIPAG report suggest that there is some uncertainty surrounding the assessment of stock status using the surplus production model. The surplus production assessment model best describes trends in stock development and is not fully sensitive to year-to-year changes. Large and rapid changes in recruitment may therefore not be fully captured in the model predictions. In contrast the length-based model would in theory be more precise in making short-term predictions as it explicitly keeps account of the incoming recruitment to the fishery.

The stock assessments of *Pandalus borealis* in the Skagerrak and Norwegian Deep are effectively peer reviewed at NIPAG meetings by scientists from various nations, and the annual NIPAG reports are peer-reviewed within ICES by an ICES Review Group. The Review Group involves stock assessment scientists not involved with the *P. borealis* assessments and, from time to time, scientists who are outside the ICES assessment process. The Group may query aspects of the assessment model, the current assessment and the presentation of the results. The Review Group will then recommend to ACOM, the ICES Advisory Committee, that the assessment could be accepted as the basis for advice.

3.3.4.4 Management advice based on assessment of stock status

The management advice for the Skagerrak and Norwegian Deep stock based on the NIPAG assessment is formulated by the ICES Advisory Committee (ACOM) on behalf of the Council of ICES. The annual ICES Advice Book contains a general section (Book 1) which contains the conceptual framework for the assessments and advice including the maximum sustainable yield (MSY) concept and the setting of reference points under the precautionary approach (PA) to fisheries management.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/General_context_of_ICES_advice_2015.pdf
In addition there are a series of books containing regional reports on the various marine eco-regions. Book 6 covers the North Sea and Skagerrak and includes advice on the *Pandalus borealis* stock in the Skagerrak and Norwegian Deep.
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/pand-sknd.pdf

The ICES advice for the Skagerrak and Norwegian Deep *Pandalus borealis* stock, based upon the stock assessment described within the 2015 NIPAG report, is that catches should be no more than 21, 500 tonnes in 2016, and assuming discard rates similar to those observed in the last three years, this implies landings of no more than 18 598 tonnes (ICES, 2015d). The advice lists the various reference points that are used to assess the status of the stock (Table 3) and confirms that within the MSY approach, the stock is well above Btrigger and that F is below Fmsy, and that within the Precautionary Approach there is a low risk in 2015 of the stock falling below Blim or of F exceeding Flim (Table 4). (The NIPAG report also provides values for the reference points derived from the length-based model, but as these were not used in formulating this year's advice, they are not reproduced here.) The assessment considered a range of catch options for 2016 from 14,000 to 24,000 tonnes and concluded that application of the MSY

approach would imply that catches of up to 21,500 tonnes would ensure that fishing mortality remained below Fmsy and that stock biomass would remain above Bmsy (Table 4).

Reference points

	Type	Value	Technical basis
MSY approach	MSY $B_{trigger}$	0.5 B_{MSY}*	Relative value. B_{MSY} is directly estimated from the assessment surplus production model and changes when the assessment is updated.
	F_{MSY}	*	Relative value. F_{MSY} is directly estimated from the assessment surplus production model and changes when the assessment is updated.
Precautionary approach	B_{lim}	0.3 B_{MSY}	Relative value.
	B_{pa}	Not defined.	
	F_{lim}	1.7 F_{MSY}	Relative value (the F that drives the stock to B_{lim}).
	F_{pa}	Not defined.	

(Last changed in: 2013)

* Fishing mortality is estimated only in relation to F_{MSY} and total stock biomass is estimated only in relation to B_{MSY}.

Table 3. Reference points used in provision of advice on shrimp stocks in the Skagerrak and Norwegian Deep.

Catch options 2016 (in thousand tonnes)	14	16	18.5	20	21.5	24
Corresponding wanted catch* (in thousand tonnes)	12.110	13.840	16.003	17.300	18.598	20.760
Stock size (B_{2017}/B_{MSY}), median	1.42	1.41	1.37	1.33	1.32	1.28
Fishing mortality (F_{2016}/F_{MSY}), median	0.60	0.69	0.79	0.82	1.00	1.14
Probability of B_{2017} falling below B_{lim}	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

* "Wanted catch" is used to describe fish that would be landed in the absence of the EU landing obligation, and has been calculated based on the average discard rates in 2012—2014 (13.5%).

Table 4. Outlook for 2016 based on a range of catch options

Source: ICES 2015d

Annual ICES advice for this stock over recent years is shown in Table 5.

Year	ICES advice	Predicted landings corresp. to advice	Predicted catch corresp. to advice	TAC Div. IIIa	TAC Norwegian zone Div. IV *	Discard estimates	ICES landings	ICES catch (discards and landings)
1987	Not assessed						14.2	
1988	Catches significantly below 1985–1986 catch						12.2	
1989	No advice			3.1 **			11.2	
1990	IIIa: F as F(pre-1985); IVa East: No increase in F	10.0		2.75 **			10.2	
1991	No increase in F; TAC	12.0		8.55			11.6	
1992	Within safe biological limits	15 ***		10.50	4.500		13.1	
1993	Within safe biological limits	13 ***		10.50	4.500		12.8	
1994	Within safe biological limits	19 ***		12.60	5.400		11.5	
1995	Within safe biological limits	13 ***		11.20	4.800		13.4	
1996	No advice	11 ***		10.50	4.500		14.1	
1997	No advice	13 ***		10.50	4.500		15.1	
1998	No increase in F; TAC	19 ***		13.16	5.640		15.5	
1999	Maintain F	19 ***		13.16	5.640		11.3	
2000	Maintain F	< 11.5 ***		9.10	3.900		11.0	
2001	Maintain F	13.4		10.15	4.350		11.3	
2002	Long-term average landings	12.6		10.15	4.350		12.5	
2003	Maintain F	14.7		10.15	4.425		13.8	
2004	No increase in F	15.3 #		10.71	4.590		16.0	
2005	No increase in catch above recent level	~13 #		10.71	4.590		14.2	
2006	No increase in catch above recent level	~13.5 #		11.2	4.800		14.3	
2007	No increase in landings above recent level	~14.0 #		11.62	4.980		13.6	
2008	No increase in landings above recent level	~15 #		11.62	4.980	0.5	13.0	13.6
2009	Same advice as last year	~15 #		11.62	4.980	0.5	11.1	11.5
2010	No increase in landings above 2008 level	~13 #		9.8	4.200	0.6	7.8	8.3
2011	At least 30% decrease in landings of 2007–2009, reduce discards, mandatory sorting grids	< 8.8		8.3	3.570	0.9	8.2	9.0
2012	Reduce catches and reduce discards	-		7.1	3.035	1.1	7.8	8.8
2013	Reduce landings by 36% and reduce discards	≤ 5.8		6.65	2.850	0.9	8.4	9.3
2014	MSY considerations, reduce discards	≤ 5.426	≤ 6.0	6.65	2.850	2.4	10.0	12.3
2015	MSY considerations, no increase in F, reduce discards	≤ 9.777	≤10.9	7.63	3.270			
2016	MSY approach	≤ 18.598##	≤ 21.5					

* TACs in the Norwegian zone of Division IVa.

** EU zone only.

*** Catch at *status quo* F.

Single-stock boundaries and the exploitation of this stock should be conducted in the context of mixed fisheries, protecting stocks outside safe biological limits.

Wanted catch.

Table5. Northern shrimp in the Skagerrak and Norwegian Deep: Historical trend in ICES advice, management, discards, landings and catches.

3.4 Principle Two: Ecosystem Background

Principle 2 of the Marine Stewardship Council standard states that:

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

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

3.4.1 Types of gear used in the shrimp fishery

Any impact depends primarily on the nature of the fishing gear used in the fishery. Three types of trawl have been used over the last few years in the Norwegian fishery for shrimp in the Skagerrak and Norwegian Deep - the standard Pandalus trawl (gear code 315), the standard Pandalus trawl incorporating a Nordmore selective grid (gear code 303), and the standard Pandalus trawl incorporating a Nordmore selective grid and a fish retention device or "tunnel" (gear code 337). The catch composition may vary significantly between the three types of gear and therefore in relation to retained and by-catch species, ideally landings and catch composition data should be considered separately for each gear.

The standard Pandalus trawl used traditionally in the fishery is regulated through a minimum stretched mesh size of 35mm. The standard trawl may have significant by-catch other than *Pandalus borealis*, and a Nordmore selective grid is incorporated into the standard trawl to target shrimps when a relatively clean catch of shrimp with very little by-catch is required. The Nordmore grid has a bar spacing of 19mm which excludes the capture of fish that are approximately 20 mm or more and has been shown to reduce by-catch significantly (Richards and Hendrickson, 2006; Isaksen and Solvdal, 1997). Empirical evidence of the efficacy of the grid in reducing by-catch in the Skagerrak shrimp fishery comes from the Swedish observer programme. The SLU observer sampling data for 2011 and 2012 allow a direct comparison of the catch rate of species other than shrimp in the standard trawl and that incorporating a grid. The percentage of the total catch that was fish was over 50% in both years for the standard trawl in comparison with only 12% for the trawl incorporating a grid (Table 6).

(A) Standard trawl

Year	Landed Shrimps (Tonnes)	Discarded shrimps (Tonnes)	Fish landings and discards (Tonnes)	Total catch (Tonnes)	Fish as percentage of total catch
2011	1258.6	358.9	2070.0	3687.5	56.1%
2012	920.0	405.8	1371.3	2697.1	50.8%

(B) Trawl with grid

Year	Landed Shrimps (Tonnes)	Discarded shrimps (Tonnes)	Fish landings and discards (Tonnes)	Total catch (Tonnes)	Fish as percentage of total catch
2011	351.1	100.1	63.9	515.1	12.4%
2012	463.6	204.5	98.0	766.1	12.8%

Table 6. Estimate of fish landings and discards as a percentage of total catch for standard trawl and the trawl with grid. (Source: SLU observer programme)

Under the EU–Norway agreement, the selective grid is mandatory for all vessels in the Skagerrak, except within 4nm of the Norwegian coastline. A similar regulation was introduced in January 2015 within the Norwegian Deep area of the fishery, but many Norwegian vessels within the UoC have previously been using a grid at all times. The exception is the small vessels fishing primarily within the 4 nm baseline. However there may still be discarding of both shrimp and other species when the grid trawl is used. Shrimp may be discarded for two reasons, either because they are shrimps that are less than 15mm carapace length (CL) for which there is no market, or because of “high-grading”, which occurs when vessels may discard medium-sized or lower value shrimp in order to utilise their quota by landing only larger, high value shrimps and to avoid the handling costs of low value catch. Quota restrictions may occasionally provide an incentive for high-grading in the Norwegian fishery, but there is no evidence that it occurs on a regular basis (Directorate of Fisheries, pers. comm.). If vessels have a fish quota, then within the grid trawl they are permitted to use a fish retention device or “tunnel”, a 120mm square mesh tunnel at the grid’s fish outlet. The tunnel retains larger commercial fish, but may also prevent the escape of non-commercial species. In some areas, modifications to the standard gear regulations have been made on a voluntary basis to increase the selectivity of the gear. For example many Norwegian vessels use a mesh size of 40-45 mm, instead of the 35 mm required by the current regulations.

3.4.2 Landings and catch compositions

The NIPAG 2013 report (NAFO/ICES, 2013) provides summary landings (retained) data aggregated across the Swedish, Norwegian and Danish fleets for 2012 (the last full year for which data are available for the standard trawl without grid in the Skagerrak). These data show only 5% of total landings with the grid trawl are other fish and shellfish species in the Skagerrak, but 21% in the standard trawl, and similarly 22.5% in the North Sea using the standard trawl. The NIPAG reports for 2014 and 2015 (NAFO/ICES, 2014; NAFO/ICES, 2015) provide comparable data for 2013 and 2014 which show that less than 2% of total landings with the grid trawl are other fish and shellfish species in the Skagerrak.

However for fishing trips in the Skagerrak when a fish tunnel is incorporated into the trawl with grid, 18.5% and 17.9% of total landings are other fish and shellfish species for 2013 and 2014 respectively. The grid became mandatory in the Skagerrak in 2013, so there are no comparable data for the standard trawl without grid for 2013, but in the Norwegian Deep where the grid was not mandatory until 2015, the NIPAG reports shows that 18.7% and 20.4% in 2013 and 2014 respectively of the total landings in the Norwegian Deep area of the fishery in the standard trawl with no grid are other fish and shellfish species.

Landings data for the Norwegian fleet only in the last three years from all gears combined suggest that only saithe and cod are likely to be main retained species (Table 7). Summary data for both the Danish and Swedish fleet also suggest that the only likely main retained species in the Danish and Swedish fisheries would be saithe and cod. The annual NIPAG reports acknowledge that other non-commercial species including deep sea species will also be caught in the grid trawl with a tunnel but does not provide any quantitative data for this discarded component of the catch.

Landings data for 2009-2013 presented in Ulmestrand et al., 2014 show that between 60% and 80% of the landings from the Norwegian shrimp fleet are from the Skagerrak and 20% to 40% are from the Norwegian Deep (Table 8).

(a)	*2012*		*2013*		*2014*	
Species:	*Total tonnes*	*% of total catch*	*Total tonnes*	*% of total catch*	*Total tonnes*	*% of total catch*
Blue Whiting						
Norway lobster	*34.5*	*0.8*	*21.7*	*0.5*	*20.5*	*0.4*
Pandalus	*3564.6*	*83.8*	*3775.4*	*84.5*	*4498.5*	*84.5*
Angler fish	*37.9*	*0.9*	*30.5*	*0.7*	*32.5*	*0.6*
Whiting	*4.3*	*0.1*	*3.0*	*0.1*	*3.5*	*0.1*
Haddock	*48.4*	*1.1*	*24.5*	*0.5*	*34.7*	*0.7*
Hake	*11.4*	*0.3*	*6.7*	*0.2*	*11.1*	*0.2*
Ling	*35.0*	*0.8*	*37.8*	*0.8*	*37.3*	*0.7*
Saithe	*124.9*	*2.9*	*153.5*	*3.4*	*222.2*	*4.2*
Witch flounder	*28.1*	*0.7*	*24.5*	*0.5*	*21.6*	*0.4*
Norway pout						
Cod	*231.7*	*5.4*	*237.4*	*5.3*	*312.8*	*5.9*
Other market fish	*135.2*	*3.2*	*151.6*	*3.4*	*129.7*	*2.4*
TOTAL	*4256.0*	*100.0*	*4466.6*	*100.0*	*5324.3*	*100.0*

(b)	2012		2013		2014	
Species:	Total tonnes	% of total catch	Total tonnes	% of total catch	Total tonnes	% of total catch
Blue Whiting						
Norway lobster	8.5	0.7	6.5	0.5	5.2	0.3
Pandalus	1003.9	77.1	1134.5	81.9	1250.2	79.9
Angler fish	39.2	3.0	32.1	2.3	34.6	2.2

Whiting	1.3	0.1	1.1	0.1	1.3	0.1
Haddock	8.0	0.6	8.6	0.6	15.3	1.0
Hake	20.2	1.6	7.3	0.5	5.8	0.4
Ling	31.1	2.4	24.1	1.7	22.2	1.4
Saithe	92.7	7.1	71.8	5.2	138.2	8.8
Witch flounder	1.0	0.1	0.7	0.1	0.6	0.0
Norway pout						
Cod	50.9	3.9	60.0	4.3	56.5	3.6
Other market fish	46.0	3.5	38.1	2.7	35.7	2.3
TOTAL	1302.8	100.0	1384.8	100.0	1565.5	100.0

Table 7. Landings of *Pandalus borealis* and other retained species from Pandalus trawls in 2012-2014 in (a) Skagerrak and (b) Norwegian Deep based on sales slips.

(source: Norwegian Directorate of Fisheries)

Year	Skagerrak (Tonnes)	% of total (Skagerrak)	Norwegian Deep (Tonnes)	% of total (Nor. Deep)	Total (Tonnes)
2009	4268	71.9	1672	28.1	5940
2010	2598	60.3	1710	39.7	4308
2011	2693	60.3	1773	39.7	4466
2012	3565	78.0	1007	22.0	4572
2013	3775	77.0	1134	23.1	4909

Table 8. Landings of *Pandalus borealis* by the Norwegian fleet for 2009-2013 by geographical area. (Source: Ulmestrand *et al.*, 2014)

Officially reported landings of *Pandalus borealis* by Norwegian vessels are not separated by vessels using a standard trawl with no grid (primarily vessels fishing within the 4 nm baseline), those using trawl and grid and those using trawl and grid with fish tunnel (Modulf Overvik, Directorate of Fisheries, pers. comm.).

Information on discards is available for the shrimp fishery. Discarding is illegal in Norway but discarding of small shrimp under the commercial size does take place in Norway. There are no observer data for the Norwegian fleet, so NIPAG estimates discards by the Norwegian fleet in the Skagerrak fishery by applying the Danish discards-to-landings ratio (based on observer sampling of the Danish fleet) to the Norwegian landings. In the Norwegian Deep, it is assumed that discards are primarily shrimps less than 15mm CL, and so in this area discards are estimated as the weight of catches of shrimp less than 15mm CL based on length distribution of catches and mean weight at length. Discarding of shrimp in the Norwegian fishery was estimated to be between 2 and 8% from 2009 to 2013 but this increased to 17% in 2014 (NAFO/ICES, 2015) (Table 9).

Year	Landings (tonnes)	Discards (tonnes)	Total (tonnes)	% of total catch that are discards
2009	6364	115	6479	1.8
2010	4673	75	4748	1.6
2011	4800	235	5035	4.7
2012	4796	288	5084	5.7
2013	5179	450	5629	8.0
2014	6124	1289	7413	17.4

Table 9 Landings and total catches including discards of *Pandalus borealis* by Norwegian vessels from 2009 to 2014. (source: NAFO/ICES, 2015)

It should be noted that the landings reported to ICES and published in Ulmestrand *et al*., 2014 are lower than those that are published in the NIPAG reports. As noted in section 3.2.3, landings from Denmark, Sweden and Norway consist of larger shrimps that are boiled on board and smaller shrimps that are landed fresh. Shrimp will lose weight when boiled, which means that recorded landed weights will be an underestimate of the actual weight of shrimps caught. The boiled landings figures have therefore been corrected by a conversion factor of 1.13 to obtain fresh weight for the year when sufficient data are available.

As noted above, discarding is not permitted in Norway. In practice this means that all commercial species are landed and recorded on sales slips, but non-commercial species and small individuals of commercial species may still be discarded. As there is no formal observer programme, there are no direct observations on the level of discarding or the species composition of discards from the Norwegian fleet. Indirect information is available however from observer sampling of total catch composition in the Danish and Swedish shrimp fisheries carried out under the European Commission's Data Collection Framework (DCF). Landings data are recorded from log books, and discard data are collected from observer samples and raised up to the whole fleet to provide an estimate of total discards in the fishery. The dataset allows the identification of main retained and by-catch species. In Denmark, observer sampling has been carried out in both the Skagerrak and Norwegian Deep areas of the fishery, although most sampling occurs in the most important fishing area of the Skagerrak. In Sweden observer sampling has previously been confined to the Skagerrak, but in 2015 the programme was extended to cover the Norwegian Deep area of the fishery. As the Norwegian fishery is carried out in essentially the same areas as the Danish and Swedish fisheries, observer data from Danish and Swedish vessels should provide a good approximation to the species composition of any discards in the Norwegian fishery.

Danish observer data are not separated into fishing trips using a trawl with grid and trips using a trawl with grid and tunnel because landings of shrimps are not identified by gear on the electronic log book and so it is not possible to raise the discard data to obtain a total discard rate for the different gears (Jørgen Dalskov, DTU Aqua, pers comm.). The most recent information from the Danish observer programme from 2012 to 2014 for the Skagerrak shows that for all gears combined around 80% or more of the total landings are shrimp (Table 10). Comparable figures for Swedish vessels in this fishery showed that 92-97% of the total catch in the trawl with grid were shrimp and 56% to 71% of the total catch in the trawl with grid and tunnel (DNV, 2015). Danish observer data also show that between 26% and 37% of the total catch are species other than *Pandalus borealis* (Table 10). Assuming that total

catch composition in the Norwegian fishery is similar to that in the Danish fishery, there is potential for some of these species to be identified as main retained or main by-catch species in the Norwegian fishery as defined by the MSC Certification Requirements v1.3.

Year	Landed Shrimps (Tonnes)	Other species landings (Tonnes)	Shrimps as % of total landings	Discarded shrimps (Tonnes)	Other species discards (Tonnes)	Total catch (Tonnes)	Other species as percentage of total catch
2012	1093.4	282.6	79.5	88.4	417.1	1881.4	37.2
2013	1683.7	344.6	83.0	147.0	305.3	2480.6	26.2
2014	2132.2	366.3	85.3	391.9	544.2	3434.5	26.5

Table 10. Landings and discards of *Pandalus borealis* and other species in the Skagerrak by Danish vessels from 2012 to 2014. (source: DTU Aqua observer sampling programme)

3.4.3 Identification of 'main' retained and by-catch species

As Table 10 above demonstrates, the combined landings in the Danish fleet from the trawl with grid and the trawl with grid and tunnel are around 80% shrimp in the Skagerrak, and there is a significant amount of fish and shellfish which is discarded. It is likely therefore that there will be main retained and by-catch species (as defined in the MSC Certification Requirements v1.3) identified from both the Danish fishery and from the Swedish fishery, and so it would be reasonable to assume that there would be very similar species composition in the Norwegian fishery from the same geographical area. A wide range of fish and shellfish species are caught in the shrimp trawls in the Danish and Swedish fisheries, and the most commonly observed species are shown in Table 11.

Common name	Latin name
American plaice	*Hippoglossoides platessoides*
Angler fish	*Lophius piscatorius*
Blackmouth cashark	*Galeus melastomus*
Blue whiting	*Micromesistius poutassou*
Bony fish (class of)	*Osteichthyes*
Cod	*Gadus morhua*
Common skate	*Dipturus batis*
Crimson pasiphaeid shrimp	*Pasiphaea tarda*
Glass/White shrimp	*Pasiphaea multidentata*
Greater argentine	*Argentina silus*

Haddock	*Melanogrammus aeglefinus*
Lesser argentine	*Argentina sphyraena*
Ling	*Molva molva*
Lumpfish	*Cyclopterus lumpus*
Norway pout	*Trisopterus esmarkii*
Norwegian shrimp	*Pontophilus norvegicus*
Pale ray	*Dipturus linteus*
Pink shrimp	*Pandalus montagui*
Rabbit fish	*Chimaera monstrosa*
Saithe	*Pollachius virens*
Shrimp	*Pandalus borealis*
Spurdog	*Squalus acanthias*
Squat lobsters	*Munida spp.*
Thornback ray	*Raja clavata*
Thorny skate	*Amblyraja radiata*
Velvet belly	*Etmopterus spinax*
Whiting	*Merlangius merlangus*
Witch	*Glyptocephalus cynoglossus*

Table 11. List of most common Fish and Shellfish species caught in Danish and Swedish shrimp trawls in the Skagerrak and Norwegian Deep.

(Source: DTU Aqua and SLU observer programme)

Identification of individual species in the total catch during the Danish and Swedish observer sampling trips allows an estimate of the percentage of the catch that are landings and discards for each species, and an estimate of the catch of each species as a percentage of the total catch, enabling identification of any 'main' retained or by-catch species as defined in the MSC Certification Requirements v1.3. Danish data combined for trawl with grid and trawl with grid and tunnel are available for both the Skagerrak and Norwegian Deep, but it should be noted that there are no discards in the Norwegian Deep because of the Norwegian ban on discarding.

Analysis of total catch composition for 2012 to 2014 from the Danish fishery in the Skagerrak for all gears combined showed that saithe was the only main retained species (i.e. above the threshold of 5% of the total catch) in addition to shrimp. However the assessment team concluded that cod was close to the 5% threshold and should also be considered a main retained species in the Skagerrak because of its vulnerability. Both saithe and cod were also be considered as main retained species for the Norwegian Deep area of the Danish fishery. The Danish observer data provided by DTU Aqua unfortunately does not differentiate between observer samples taken from vessels using the grid and those using grid and tunnel, so it is not possible to evaluate whether there any main retained and by-catch species for the

two gears separately. However the Swedish fleet is essentially fishing in the same areas as the Danish fleet with the same gear, and analysis by gear type (including trawls without a grid) of the more extensive data available from the Swedish observer programme identified only saithe and cod as main retained species (DNV, 2015).

Based on the species composition of the landings from Pandalus trawls in the Norwegian fishery in the Skagerrak and Norwegian Deep (Table 7), and the analysis of total catch composition from the Danish and Swedish fisheries in the same area, the assessment team concluded that saithe and cod could be considered as main retained species in the Norwegian shrimp fishery.

In the shrimp fishery there is a large number of species which are caught and discarded without any individuals retained. Without a formal observer programme in the Norwegian fishery, there is no information on species which might be caught and discarded despite the prohibition on discarding. Such information is available for the Danish and Swedish fisheries which use the same gear in the same areas. In the Danish fishery in both the Skagerrak and Norwegian Deep, there were no fish species which constituted more than 5% of the catch that had not already been identified as main retained species. Similarly in the Swedish fishery total catch composition is available for the Skagerrak for both trawl with grid and trawl with grid and tunnel, and for both types of gear, no main bycatch species were identified. Based on the results of analysis of the total catch compositions in both the Danish and Swedish fisheries, and because the prohibition of discarding in Norway is likely to at least reduce the overall level of discarding in the fishery, the assessment team concluded that there were no main by-catch species in the Norwegian fishery.

During the site visit some stakeholders suggested that there might be significant discarding of blue whiting and Norway pout in the Norwegian fishery. Without a formal observer programme, this allegation is difficult to evaluate. However analysis of total size compositions from the Danish and Swedish observer programmes over the last few years in both the Skagerrak and Norwegian Deep showed that neither species contributed more than 3.5% of the total catch in any year for both trawl with grid and trawl with grid and tunnel. There is however no information on total catch compositions of Norwegian vessels fishing inside the 4nm baseline using a standard Pandalus trawl without a grid. There are some historical data for the Swedish fleet for the standard trawl without grid (prohibited since February 2013) which show that in some years Norway pout, herring and greater argentine have constituted more than 5% of the total catch, but these data are not from the same area in which Norwegian vessels are permitted to fish without using a grid. Many Norwegian vessels use a grid when fishing both inside and outside the 4nm limit of the Norwegian coastline, so even if some bycatch species constitute more than 5% of the total catch for some fishing trips, these fishing trips will account for only a small proportion of the total fishing trips and so for the Norwegian Pandalus fishery as a whole, it can be concluded that there are no main bycatch species.

3.4.4 Retained species

3.4.4.1 Stock status and management of main retained species

Cod

In 2004 the EU and Norway “agreed to implement a long-term management plan for the cod stock, which is consistent with the precautionary approach and is intended to provide for sustainable fisheries and high yield leading to a target fishing mortality of 0.4.” This management plan was renewed in 2008, and was reviewed in February 2013, but no modification was implemented. ICES evaluated the plan in

2009 and considered the plan to be consistent with the precautionary approach in the short term (< 4 years). The EU adopted a long-term plan for this stock with the same aims (Council Regulation (EC) 1342/2008; Annex 6.4.3). In addition to the EU–Norway agreement, the EU plan also includes effort restrictions, reducing kW-days available to community vessels in the main metiers catching cod in direct proportion to reductions in fishing mortality until the long-term phase of the plan is reached, for which the target F is 0.4 if SSB is above Bpa. No reduction in effort ceilings was applied between 2012 and 2014.

ICES 2015 advice for cod in the North Sea, Eastern Channel and the Skagerrak (ICES, 2015a) shows that there has been a gradual improvement in the status of the stock since 2007. SSB has increased from the historical low in 2006 and in 2014 is now at a level above Blim (Figure 13), but target reference points are not reached yet. Fishing mortality declined from 2000 and is now estimated to be around 0.4, but still above Fmsy. Recruitment since 1998 has remained poor. The stock assessment was updated during a benchmark in 2015, following which ICES updated the assessment and the reference points. If EU-Norway wish to be consistent with the new reference levels, a revision of the EU–Norway management strategy should be considered. Until such a revison is carried out, ICES advice continues to be based on the MSY approach.

ICES stock advice is that when the MSY approach is applied that catches in 2016 should be no more than 49 259 tonnes, and if discards rates do not change from those in 2014, this implies landings of no more than 40 419 tonnes.

http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/cod-347d.pdf

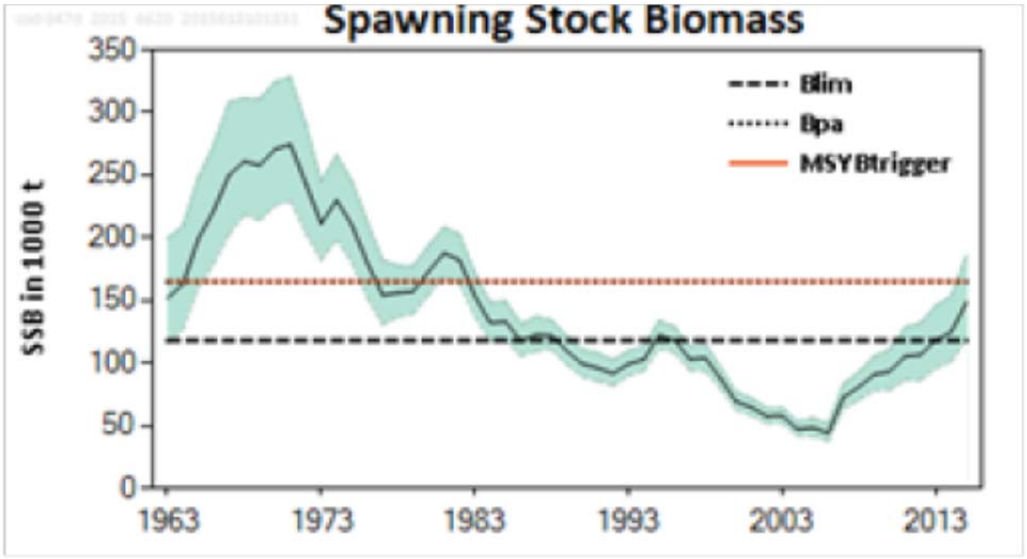


Figure 13 Historical trend of Spawning Stock Biomass for cod in the North Sea, Eastern Channel and Skagerrak

Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/cod-347d.pdf

In summary the assessment team concludes that the current SBB of cod is now above Blim in the Skagerrak Sea, which would mean that measures taken under the framework of the management plan have resulted in a gradual improvement of the status of the stock in this region.

Saithe

Saithe in the North Sea and Skagerrak

In 2013, EU and Norway renewed the existing agreement on *"a long-term plan for the saithe stock in the Skagerrak, the North Sea and west of Scotland, which is consistent with a precautionary approach and designed to provide for sustainable fisheries and high yields."*

ICES 2015 Advice for saithe in the North Sea and Skagerrak shows that SSB increased above Bpa in 1997, but has declined since 2005 and has been fluctuating around Bpa (same value as MSY Btrigger) since 2011 (Figure 14). Fishing mortality has fluctuated around Fmsy since 1997. Recruitment has been below average since 2006, but does not appear to be linked to SSB, but may be related to changes in the environment.

ICES 2015 Advice for saithe in the North Sea and Skagerrak advises on the basis of the EU–Norway management plan and since SSB at the beginning of 2015 is marginally below200 000 tonnes Bpa, paragraph 3 of the harvest control rule applies, resulting in a F of 0.298 and that catches should therefore be no more than 75 049 tonnes. Assuming that discard rates do not change, this implies landings of no more than 68 601 tonnes in 2016 for the whole assessment area (ICES, 2015b). This is expected to lead to an SSB of 168 129 tonnes in 2017, which is below Bpa (same value as MSY Btrigger, 200 000 tonnes).

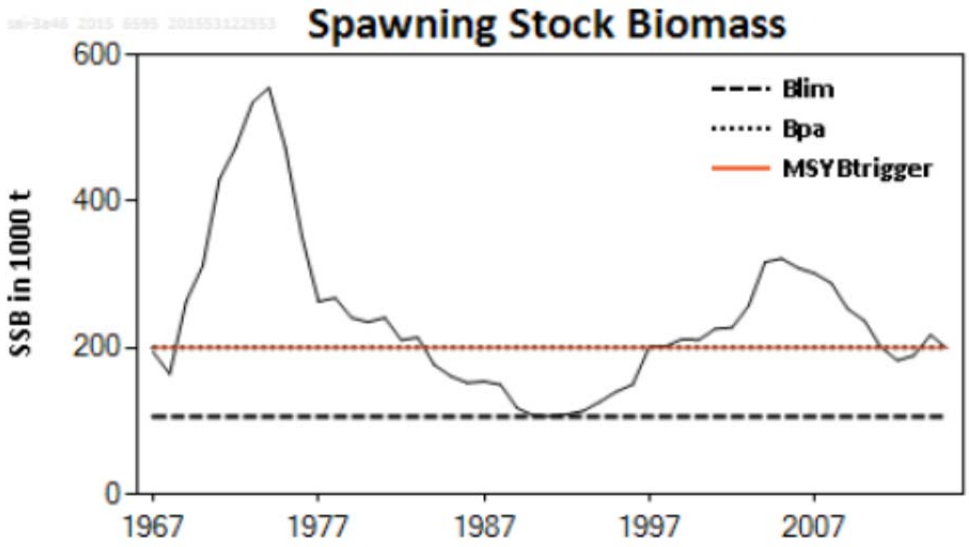


Figure 14. Historical trend of Spawning Stock Biomass for saithe in the North Sea and Skagerrak.

(Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/sai-3a46.pdf

3.4.5 By-catch species

3.4.5.1 Stock status and management of main by-catch species

Total catch composition data are not available for the Norwegian fishery, but based on analysis of observer data from the Danish and Swedish fisheries, and because of the presumed low rate of discarding on all species due to the prohibition of discarding in Norway, the assessment team concluded that there were no main by-catch species in the Norwegian shrimp fishery.

3.4.6 ETP species

According to MSC methodology, ETP species are defined as those that are recognised as such by national legislation and/or binding international agreement (e.g. CITES) to which the jurisdictions controlling the fishery under assessment are party. Species that appear exclusively on non-binding lists such as ASCOBANS, IUCN Red List, OSPAR, HELCOM or that are only the subject of intergovernmental recognition (such as FAO International Plans of Action) and that are not included under national legislation or binding international agreement are not considered as ETP under MSC protocols.

During the assessment of the Norwegian shrimp fishery, the assessment team considered species listed under the following legislation (Table 12) in the context of the potential interactions with the UoC:

- CITES Appendix II
- EC Regulation 104/2015 fixing for 2015 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, to Union vessels, in certain non-Union waters, and which prohibits landing of certain species (therefore protecting them)

Species	CITES Appendix II	Council Regulation 104/2015
Amblyraja radiata (Starry ray/Thorny skate)		X
Cetorhinus maximus (Basking shark)	X	X
Carcharodon carcharias (White shark)		X
Dipturus batis (Common skate)		X
Etmopterus pusillus (Smooth lanternshark)		X
Lamna nasus (Porbeagle)		X
Manta alfredi (Reef manta ray)		X
Manta birostris (Giant manta ray)		X
Mobula spp. (Mobula rays)		X
Phocoena phocoena (Harbour porpoise)	X	
Pristis spp. (Sawfish)		X

*Raja clavata (*Thornback ray*)*		X
Rhinobatidae (Guitarfishes)		X
*Squatina squatina (*Angel shark*)*		X

Table 12. Protection of species and determination of inclusion within ETP category.

During the assessment of the Norwegian shrimp fishery, the assessment team have considered the above list of species in the context of the potential interactions with shrimp trawls. The result of this analysis determined the Outcome Status score. To score well, a fishery must be conducted in a manner that ensures ETP impacts fall within acceptable limits (as defined under legislation and / or binding agreements that are in place). In addition to the above species, previous versions of the EU Regulations also included spurdog (*Squalus acanthias*), and the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS), the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), and the Bern Convention list harbour seal (*Phoca vitulina*), grey seal (*Halichoenus grypus*) and ringed seal (*Phoca hispida*).

Most capture fisheries have at least some potential to interact with Endangered, Threatened or Protected species. The ETP interaction profile for each gear type varies and is greatly influenced by the manner in which it is utilised. Factors such as frequency of use, duration of deployment, season, and location, all play a role in defining the ETP interaction profile of a gear type.

Shrimp trawls are considered to have varying degrees of potential to interact with ETP species. In general, populations of endangered, threatened and protected (ETP) species are well studied in the North Sea, Skagerrak and Kattegat, with considerable levels of work undertaken in relation to the regular monitoring of fisheries interaction through the deployment of on-board observers, capture of anecdotal information, focused national study/research programmes and a range of EU funded research programmes.

Norwegian fishery regulations require that ETP species are recorded on log books in the shrimp fishery, and ETP species are covered by the general prohibition on discarding, so in principle the capture of all ETP species should be recorded. Regulation J-250-13 determines that for porbeagle, basking shark, spurdog and silky shark, live individuals of these species should be released immediately, whereas dead or dying individuals should be recorded in the log book (but not necessarily landed). Common skate is not included in this regulation because there is no directed fishery for this species and bycatches of common skate in Norwegian fisheries are almost non-existent. In practice, it cannot be assumed that all captured and released animals are recorded in the log books due to practical constraints of recording at sea or may be recorded under a common name such as “skates”. Directorate of Fisheries figures show that in 2014 there were recorded landings of around 1 tonne of spiny dogfish/spurdog (*Squalus acanthias*) in the shrimp fishery representing 0.02% by weight of the total landings. A few kilograms of cuckoo ray, thornback ray and Norwegian skate were identified by species, and around 13 tonnes of unclassified “skates and rays” (which may include common skate) were recorded as landed in the shrimp fishery representing 0.2% of the total catch in the shrimp fishery. However common skate is extremely rare in the catch from shrimp trawls in Norwegian waters, and during the most recent shrimp survey in January 2015 only 4 thornback rays and no common skate were registered as caught in the survey. There were no recorded captures of porbeagle or basking shark in shrimp trawls, and Directorate of Fisheries figures and fishermen confirm that no marine mammals or birds were caught in shrimp trawls in 2014.

As there is no observer programme in Norway, and no directed ETP sampling programme, there may be incidental captures of ETP species that go unrecorded. However there are observer programmes in the Danish and Swedish shrimp fleets which fish in the same areas and with the same gear as Norwegian vessels, so captures of ETP species in these observer programmes will inform the likelihood of capture of ETP species in the Norwegian fishery. The Danish observer programme recorded some capture of starry rays / thorny skates (*Amblyraja radiata*) which have been added to the Council regulation in 2015. All captured thorny skate were discarded. No thornback rays (*Raja clavata*) were recorded during the observer programme, but there were small landings of *Raja* spp. recorded in log books, but these rays were not identified by species. There was a record of porbeagle catches in 2009, but not in subsequent years. There have been no records of capture of common skate (*Dipturus batis*), harbour porpoise (*Phocoena phocoena*) or other species listed in Table 12, and Danish fishermen stated that they had not caught any marine mammals or birds in the shrimp trawls in recent years. More extensive sampling for endangered species has been undertaken in the Skagerrak by Swedish scientists in the same area fished by Danish vessels using the same gear. Records from 2012 to 2014 show that thorny skate were caught in all years, and there was also a record of 2 thornback ray caught in 2014 in a shrimp trawl incorporating a grid and fish tunnel. Other vulnerable species, but considered as ETP species, caught in the Swedish shrimp trawls were velvet belly (*Etmopterus spinax*), spurdog (*Squalus acanthias*), and blackmouth cashark (*Galeus melastomus*) (Katja Ringdahl, SLU, pers. comm.).

Tighter regulations on the recording of by-catch in the shrimp fishery in all national fleets along with guidance on the identification of ray and skate species would provide better information on the interaction of shrimp gear with ETP species.

Common skate

The common skate, *Dipturus batis*, was formerly widely distributed over much of the North Sea but has declined throughout its range and is now only found rarely, mainly in the northern North Sea (ICES Advice 2008, Book 6: 6.4.30). It is the largest of the European batoid fish, reaching lengths of 285cm and weights of 100kg. It is a demersal species and frequently inhabits coastal areas and shelf seas. Fisheries independent surveys that have informed ICES Working Group reports found the distribution of common skate to occur across depths of 85-1000m.

There is a low probability of interactions between common skate and the shrimp fishery. The common skate was assessed by IUCN as ‘Endangered’ in 2000 and upgraded to ‘Critically Endangered’ in 2006, suggesting it “is facing an extremely high risk of extinction in the wild”. Common skate, which were once commonly found in shallow waters of the European shelf, are now generally concentrated in waters of the shelf edge, outside of the main trawling areas, and in deeper waters of the Norwegian trench where the fishery does not take place to any significant degree.

The fishing, retention on board, transhipment or landing of common skate is prohibited by CR 43/2014. Common skate may be landed only where specimens are taken outside of European waters (according to Council Regulation 57/2011). This Regulation also establishes the obligation to report some species of ray separately. If skate are taken within European waters, such as the Skagerrak or Kattegat, they must be returned to the water immediately. If returned quickly there is a high probability for that individuals of these species will survive (Mandelman and Farrington 2007, Revill et al.2005, Enever et al 2009, Enever et al. 2010).

Spurdog

Spurdog is seriously depleted in the OSPAR Area and the stock may be in danger of collapse as a result of unsustainable removal in former target fisheries (ICES WGEF 2008). The aggregating habit of spurdog made the species highly vulnerable to localised, seasonal fisheries, although most target fisheries for spurdog have collapsed over the past decade. Previously retention of by-catch from mixed fisheries has also been unrestricted. Recent stock assessments for spurdog in the North- East Atlantic (e.g. Heesson 2003, Hammond and Ellis 2004) estimated very low stock status for this previously highly abundant species. Continued target fishing and retention of by-catch in the decade since the above stock assessments are likely to have reduced the stock further and the North-East Atlantic population is presently listed as Critically Endangered in the IUCN Red List (Fordham *et al*. 2006). Recovery requires fishing pressure on this stock to be minimised. The Total Allowable Catch (TAC) for spurdog is set at zero and there is no provision for landing by-catch as in previous years. Accordingly, a directed spurdog fishery is no longer permitted and all spurdog must be returned alive to the sea in European waters, while the discard ban in Norwegian waters requires the retention on board of all catches.

Harbour porpoise

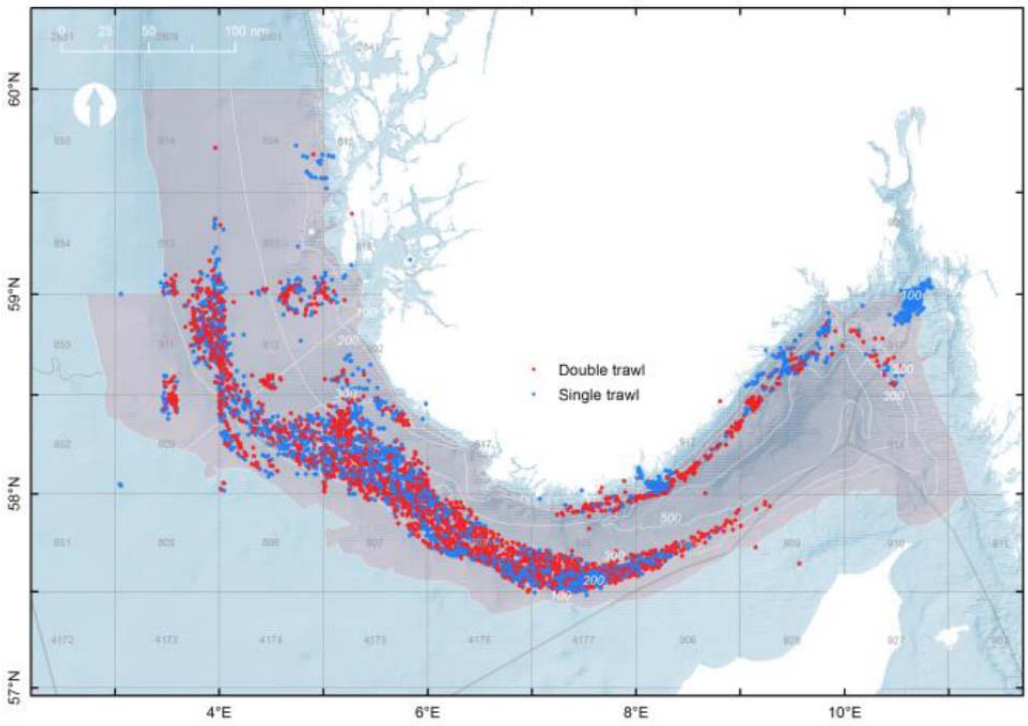
The harbour porpoise is listed in Annex II of the CITES listing, and is the flagship species in the "Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas" (ASCOBANS). A number of Natura 2000 sites are designated on account of significant use of the areas by Harbour porpoise. Sweden are signatories to the ASCOBANS agreement, which was concluded in 1991 under the auspices of the Convention on Migratory Species (CMS or Bonn Convention) and entered into force in 1994. The agreement seeks to formalise and coordinate efforts to conserve the small cetacean species shared between member countries in the ASCOBANS Area, conscious that the management of threats to their existence, such as by-catch, habitat deterioration and other anthropogenic disturbance, requires concerted and coordinated responses, given that migrating cetaceans regularly cross national boundaries. A Conservation and Management Plan forming part of the Agreement obliges parties to engage in habitat conservation and management, surveys and research, pollution mitigation and public information. Other recent projects have focussed on mapping small cetacean in North East Atlantic waters (often focussing on the North Sea). A recent notable example has been the Small Cetaceans in the European Atlantic and North Seas project (SCANS & SCANS II). Today, the most significant threat for harbour porpoise in most areas is incidental catches in fishing gear, primarily gill nets. However, it is highly unlikely that marine mammals and cetaceans interact with trawling gears. Northridge (1988) provided several reasons why this species normally avoids demersal gears. According to the DTU Aqua Report Nº 250-2012, on the Danish sampling of commercial fishery (with special attention to discards. 2010 data), no interaction with harbour porpoise were recorded during the 250 hauls analysed.

The European Union has adopted a regulation aimed at reducing the incidental catch of small cetaceans in fisheries in European Union waters. The regulation includes measures restricting Baltic Sea drift net fisheries, providing for mandatory use of acoustic deterrent devices (pingers) in some EU gillnet fisheries in the North and Baltic Seas, and the use of onboard observers on gill net vessels of over 15 m in length.

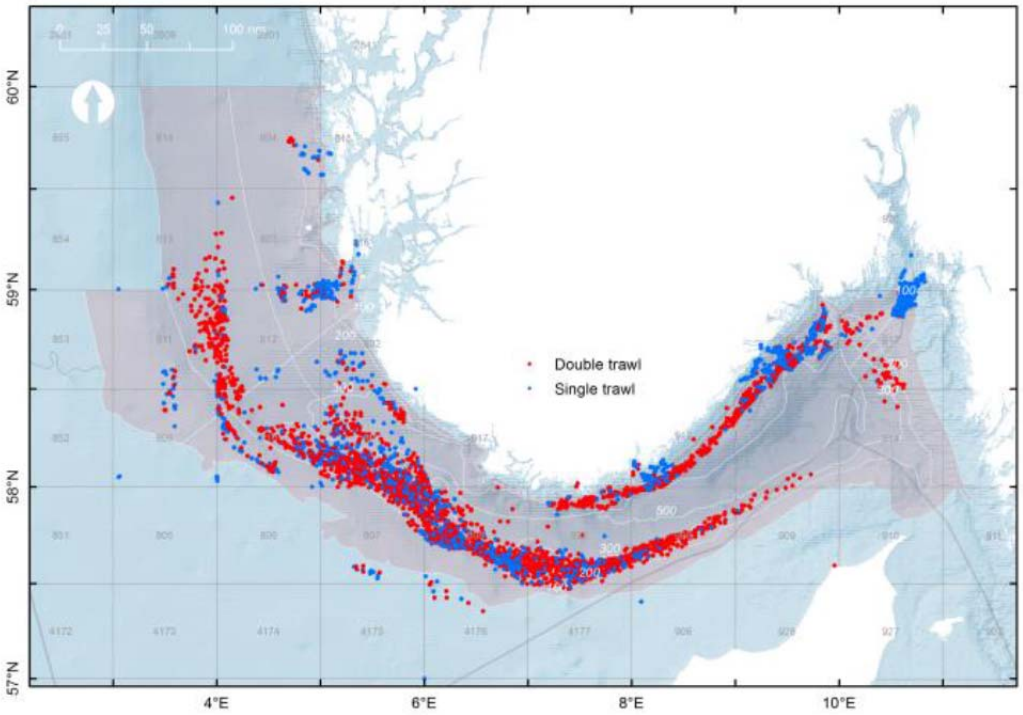
The assessment team received no reports of harbour porpoises becoming entangled in shrimp trawls.

3.4.7 Habitats

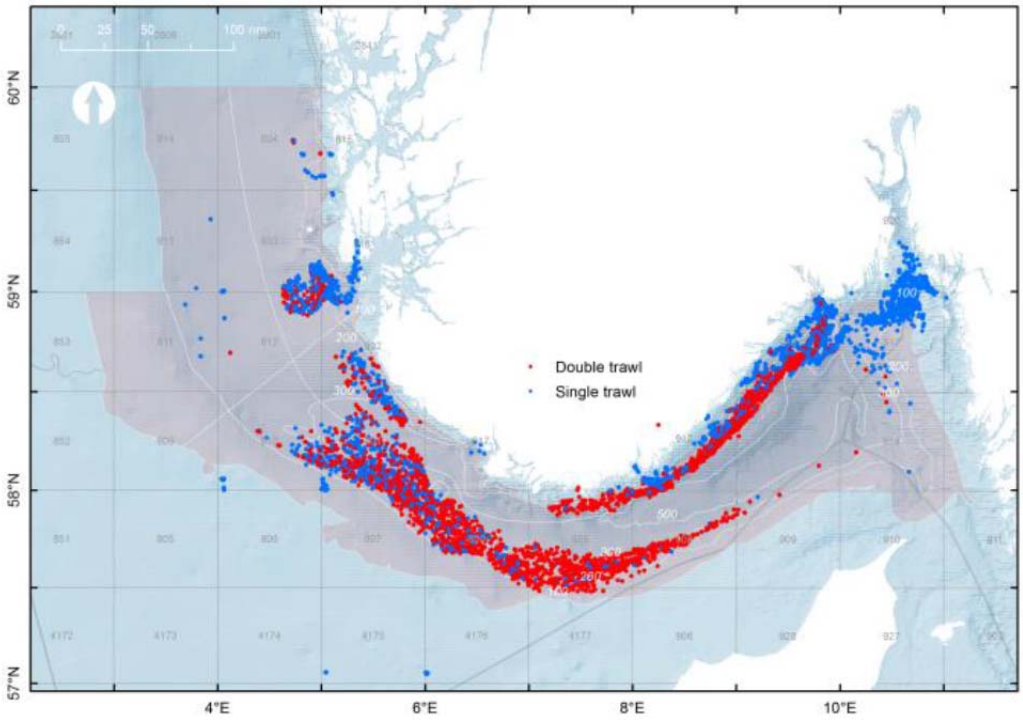
MSC Principle 2 requires that the fishery under assessment does not cause serious or irreversible harm to habitat structure and function. This is particularly relevant where sensitive, vulnerable or protected habitats and (usually benthic) species have been identified in the fishing area. As demonstrated by the data on position of trawl hauls in electronic log books for the Norwegian fleet (Figure 15), the Norwegian fishery for shrimp targets the same grounds each year. The majority of the fishery for shrimp occurs within the Skagerrak (60% to 80% of annual total landings for the period 2009-2013) with lower fishing activity in the eastern Norwegian Deep (20% to 40% of landings). There is no fishing by the vessels in the UoC in the Kattegat.



(a) 2011



(b) 2012



(c) 2013

Figure 15. Spatial distribution of the Norwegian shrimp fleet for (a) 2011, (b) 2012, (c) 2013 from electronic log books. Blue dots represent hauls with single trawl, whereas red dots represent hauls with twin trawls. (source: Directorate of Fisheries)

In the Skagerrak and Kattegat sensitive, vulnerable or protected habitats have been identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net).

The bathymetric map of the Skagerrak and Kattegat shows that the Skagerrak is generally deeper than the Kattegat with some canyons that can reach 500m depth, whereas the Kattegat is shallow with depths never exceeding 100m and a mean depth of less than 50 metres (Figure 16).

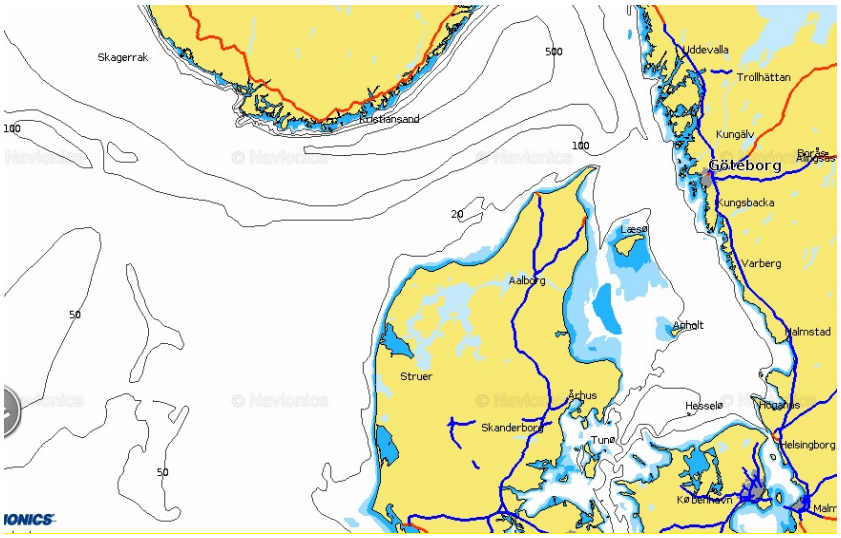


Figure 16. Bathymetric map of the Skagerrak and Kattegat Seas (source: www.navionics.com)

Sediment maps show the abundance of mud substrates in the Skagerrak and seabed and muddy sands in the Kattegat seabed (Figure 17). There are also some rocky areas reported by fishermen and marked on their plotters along the Swedish coast in the Skagerrak Sea.

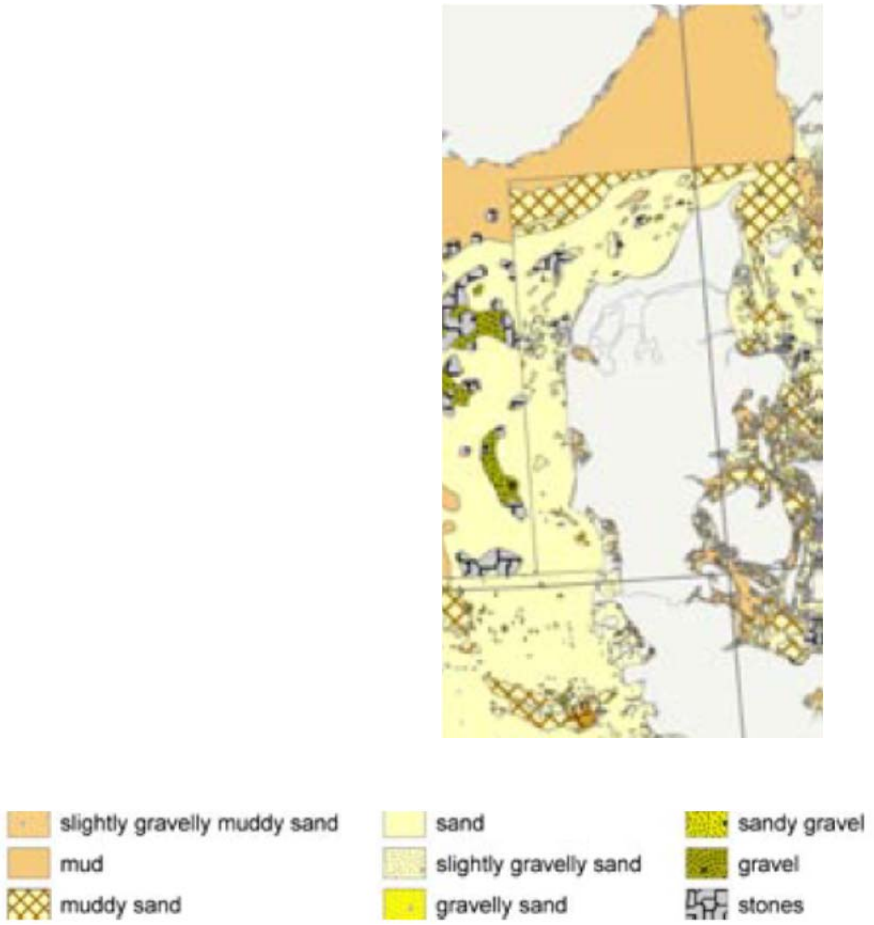


Figure 17. Aggregated sediment for Skagerrak and Kattegat. (Source: Digital Atlas of the North Sea)

OSPAR has identified various threatened or declining habitats (see general description of these habitats below) and their distribution within the Skagerrak is shown in Figures 18. Information contained in these maps has been derived from MESH Atlantic web GIS data (www.searchmesh.net/weGIS), which received funding from the ERDF-Atlantic Area Programme.

The coloured code given in www.searchmesh.net has been maintained.

1. Deep sea sponge aggregations
2. Coral gardens
3. Zostera beds
4. Seapen and burrowing megafauna communities
5. Lophelia pertusa reefs
6. Maerl beds
7. Modiolus modiolus horse mussels beds
8. Intertidal mudflats

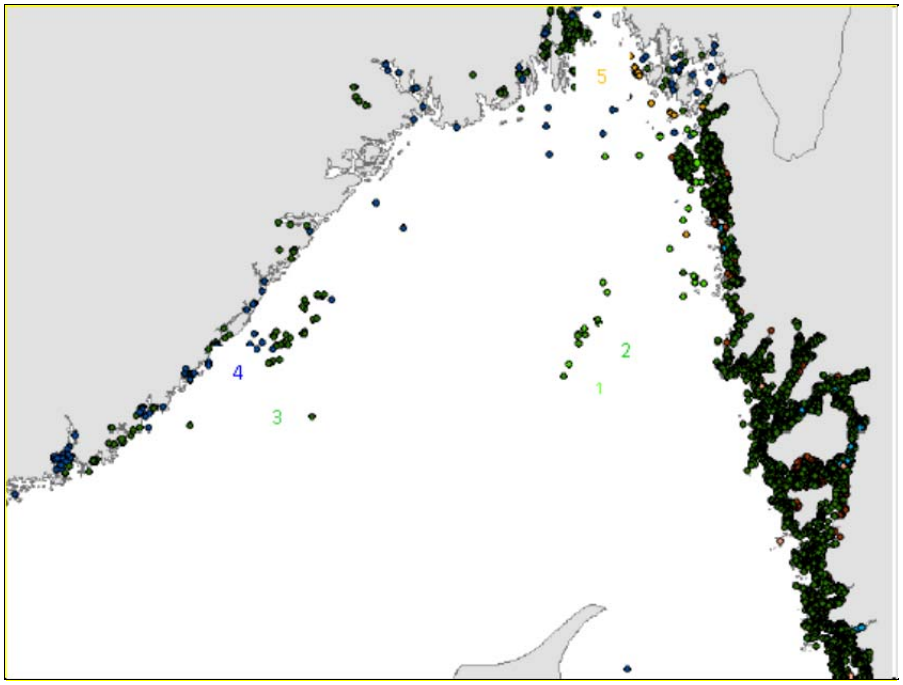


Figure 18. OSPAR threatened or declining habitat points in the Skagerrak

(Source: : http://www.searchmesh.net/default.aspx?page=1974)

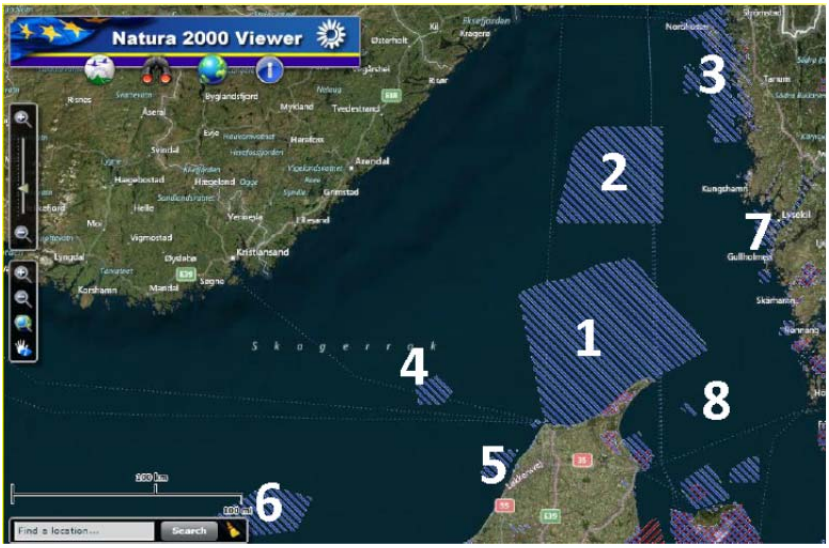
The habitats listed by OSPAR have specific characteristics. (1) Deep sea sponge aggregations serve to increase both the physical heterogeneity of a habitat and the number of available microhabitats, creating additional space for fish and invertebrate at their different life stages. They may be found both on soft and hard substrata. (2) Coral gardens can also occur on a wide range of soft and hard seabed substrata. They are formed by aggregations of colonies or individuals of one or more coral species. These communities host a high biological diversity. (3) Zostera beds are formed by eelgrass that form sea grass meadows which serve as a shelter to numerous benthic animals. (4) Seapen with burrowing megafauna communities are communities characterized by plains of fine mud in deeper waters that are heavily mixed by burrowing megafauna, which typically form a prominent sediment surface feature that creates a complex habitat, providing oxygen penetration to the sediment. (5) *Lophelia pertusa* is a cold water, reef-forming coral in the deep sea and in shallower waters, which builds reef structures with other hard corals. These reefs provide complex structural habitats that lead to a much higher biodiversity of *Lophelia pertusa* reefs relative to surrounding areas. (6) Maerl beds are benthic habitats consisting of unattached particles of calcified red algae that occur mostly in coarse clean sediments of gravels, sand or muddy/mixed sediments. (7) *Modiolus modiolus* horse mussels form beds which have a stabilising effect to the seabed and attract a range of species which attach to the top of its shell. (8) Intertidal mudflats are highly productive areas which support communities such as polychaetes, bivalves and oligochaetes. These areas provide feeding and resting to a large number of birds and fish.

Haploops communities are formed by crustacean amphipods that live inside tubes in the deep mud bottoms. These communities serve as feeding grounds for different fish species. They are not listed under the OSPAR Commission but their vulnerability is recognised by the HELCOM Commission.

The fishing gear used on the Norwegian shrimp vessels is a relatively light otter trawl gear, which operates on or near the bottom, and may thus cause some damage to benthic habitats. The contact of the trawl doors with the bottom causes a clear trail, and the clump of the gear deployed by twin-rigged trawlers can cause impact on muddy sediments but is likely to have a relatively minor impact on sandy

habitats. Bottom trawl gears are known to impact on habitat structure and function, and areas with biotic habitats generated by aggregations or colonial growth of single species are particularly vulnerable. Maerl and seagrass beds are also considered to be vulnerable to the effects of trawling gears. Habitat-generating species are represented by a wide range of taxonomic groups, e.g. *Porifera*, *Polychaeta*, *Cnidaria*, *Mollusca* and *Bryozoa* (e.g., reviews in Løkkeborg, 2005; Kaiser and de Groot, 2000; Moore and Jennings, 2000, Collie et al., 2000). In already disturbed areas, where the fauna comprise opportunistic, short-lived organisms, the trawl damage is less than in more pristine areas (Olsgard et al., 2008). In general, the response of benthic organisms to disturbance differs with substrate, depth, gear, and type of organism (Collie et al., 2000).

There are several areas designated to protect habitats in the Skagerrak. The main Natura2000 sites in the Skagerrak are shown in Figure 19. These areas have been designated to protect mainly birds, marine mammal or reefs.



1. Skagens gren; 2. Bratten; 3. Varedofjorden; 4. Store rev; 5. Lonstrup rodgrund; 6. Gule rev; 7. Gullmarsfjorden; 8 Herthas flak.

Figure 19. Main Natura2000 sites in the Skagerrak

(source: http://natura2000.eea.europa.eu/#)

Although a large number of Natura2000 sites have been designated in both the Skagerrak and Kattegat, management measures in many of these areas are still being developed and have yet to be clearly specified. The exceptions are in the the Väderöfjorden and Kosterhavets nationalpark (Kosterfjordens) (area 3 in Figure 19), and in the Gullmarsfjorden (area 7 in Figure 19) where shrimp trawling is permitted but it is closely regulated. The Väderöfjorden (Kosterfjorden) is one of Sweden's most diverse marine environments and was the first Swedish marine national park to be established in the area in 2009. Although shrimp trawling is permitted, since autumn 2000 there has been an agreement between the authorities and the fishermen with the aim of ensuring that the shrimp fishery poses no threat to biodiversity. The agreement includes a ban on trawling in the most sensitive environments, and a framework for developing knowledge and providing education on the potential impacts of shrimp trawling in the national park. In addition the fishermen introduced their own initiatives to reduce the potential impact of the trawl through a reduction in the weight of the trawl doors and the introduction of grids.

Gullmarsfjorden is a deep water fjord with a rich marine flora and fauna. The shrimp fishery was previously closed for ten years before being opened again in 1999 but with tight restrictions of gears and fishing restricted to only 5 vessels with a total of 100 trawling days permitted. Trawl haul positions from electronic log book data (Figure 15) show that Norwegian vessels do not fish in these coastal Natura 2000 sites.

Within the Skagerrak, the coral reefs in the Skagens Gren area (area 1 on Figure 19) have been protected since 2011 and there are current meetings about the future zoning boundaries to protect sensitive habitats for trawling. The Bratten area (area 2 on Figure 19) is also an important Natura 2000 site, but it is also an important fishing area for not only Swedish and Danish vessels but also Norwegian, coastal small fishing vessels and Swedish sport fishing when the weather permits. The area has steep, deep hard bottoms with the presence of horn corals and many other rare species. In order to ensure that species and habitats are maintained, fishing in the area needs to be regulated. In 2013 a working group between Sweden, Denmark and Norway was set up, and the working group formulated a management plan for regulation of the fishery which was sent in 2014 by the County of Västra Götaland to the Swedish Agency for Marine and Water Management (SwAM) for ratification. The component of the fishing plan that relates to the commercial fishery will need to be ratified by the EU so that it applies to vessels of all nations fishing within the Bratten area.

The proposed management plan consists of the following parts:

- Zones with no fishing. In some areas sport fishing can be allowed.

- Extended control with AIS – mandatory for all vessels including the sport fishing.

- Reduced fishing effort with limitations on time of fishing activity

- No anchoring in the no-fishing zones even if sport-fishing should be allowed here.

- Other measures (which not are included in the proposed rules but will be included in the management)

If these proposals are ratified, the zones where fishing is not permitted will encompass a total area of 32 741 ha (327 km2), which is 27 % of the total area of the Natura 2000 site. All known occurrences of horn corals, sponges and medusahead are covered by the protection and the large part of all known occurrences of soft corals, brittlestars (*Asteronys loveni*) and endangered species. The Swedish commercial fishing would lose approximately 5,6 % of the bottom-surface trawled today, while the sport fishing would lose 56 % of their fishing positions. To ensure that the fishing effort does not increase outside the no-fishing areas, it is proposed to limit shrimp trawling inside the Natura 2000 area to Monday to Thursday only.

The proposed closed areas in relation to the distribution of corals, sponge aggregations and seapens and burrowing megafauna are shown in Figures 20 to 22.

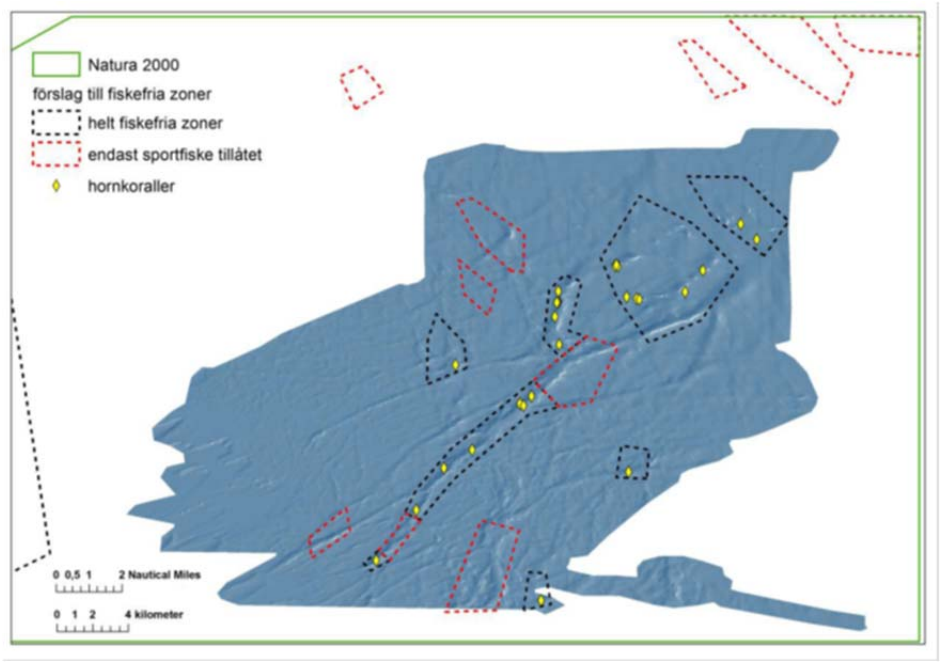


Figure 20. Distribution of horn corals in relation to proposed closed areas in the Bratten Natura 2000 site. Black boxes represent areas closed to all forms of fishing, and the red boxes represent additional areas closed to commercial fishing but where sport fishing is permitted. (Source: Kilnäs, 2013)

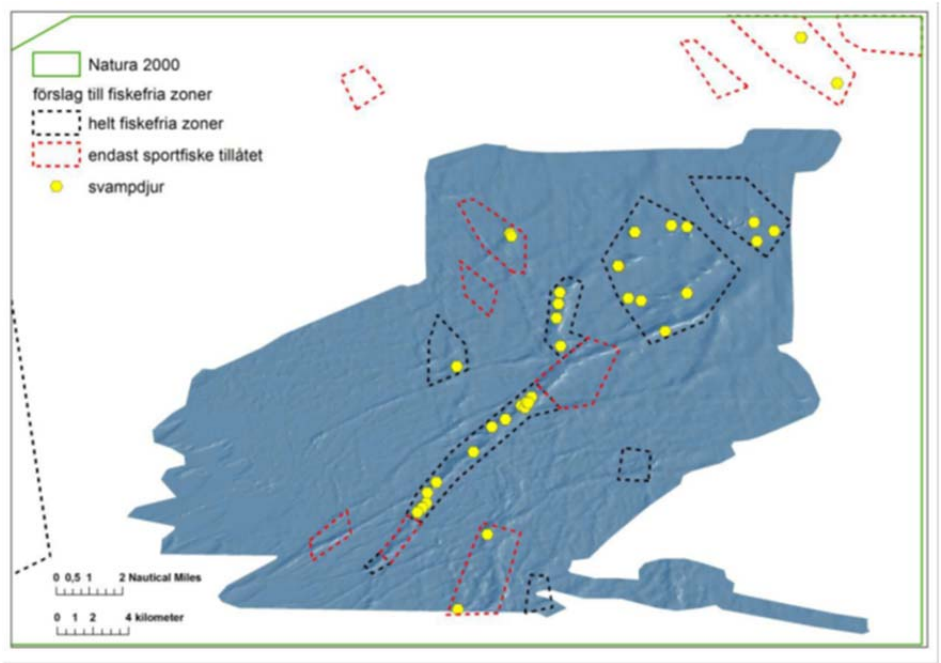


Figure 21. Distribution of sponge aggregations in relation to proposed closed areas in the Bratten Natura 2000 site. Black boxes represent areas closed to all forms of fishing, and the red boxes represent additional areas closed to commercial fishing but where sport fishing is permitted. (Source: Kilnäs, 2013)

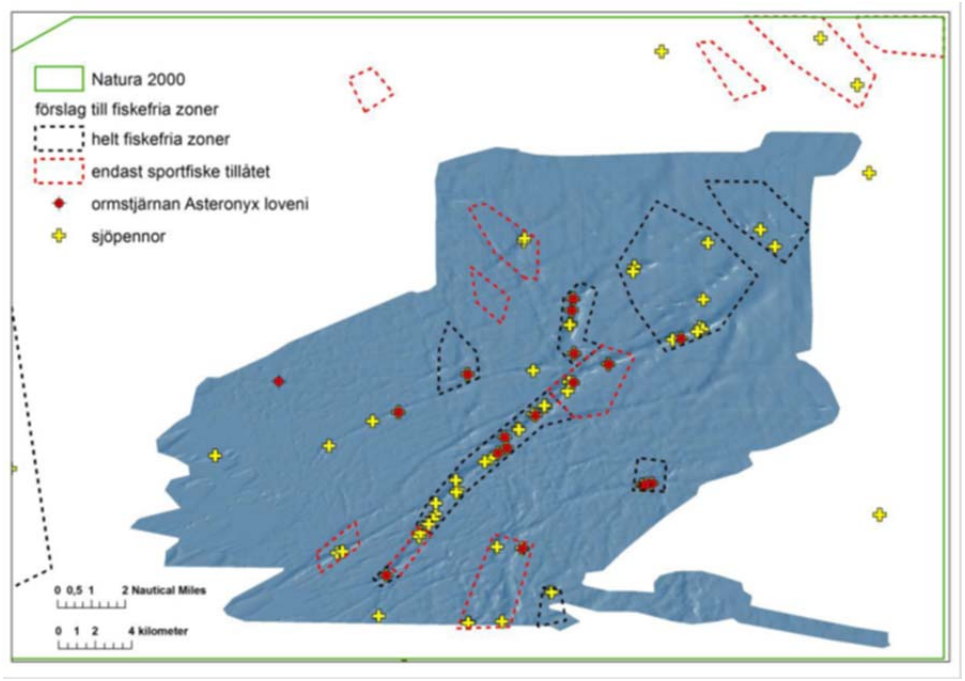
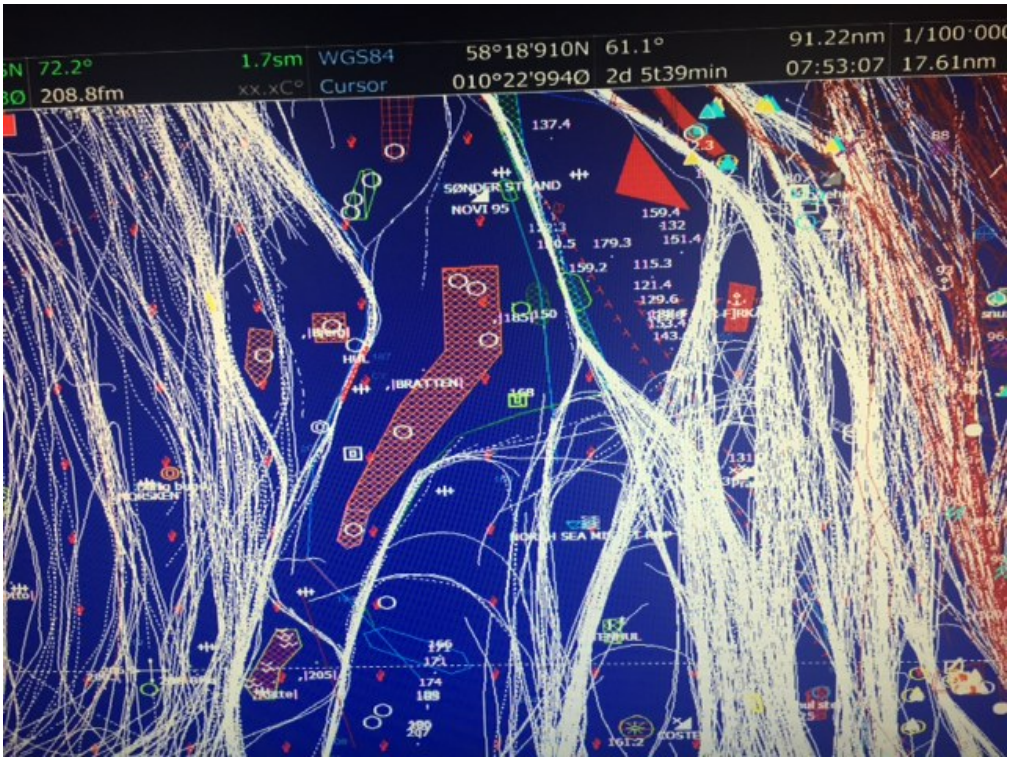


Figure 22. Distribution of seapens (yellow) and brittlestar *Asteronyx loveni* (red) in relation to proposed closed areas in the Bratten Natura 2000 site. Black boxes represent areas closed to all forms of fishing, and the red boxes represent additional areas closed to commercial fishing but where sport fishing is permitted. (Source: Kilnäs, 2013)

In general fishermen will try to avoid areas of corals or sponges to protect their nets as the following figures show for the Danish and Swedish vessels that fish in the Bratten area. (The assessment team did not receive any similar information for the small coastal Norwegian vessels which are known to fish in this area.) The distribution of current fishing activity of three Danish vessels in relation to these proposed closed areas in the Bratten, as described by plotter images from the wheel house of the vessels, suggests that there is very little current fishing activity in the proposed closed areas (Figure 23).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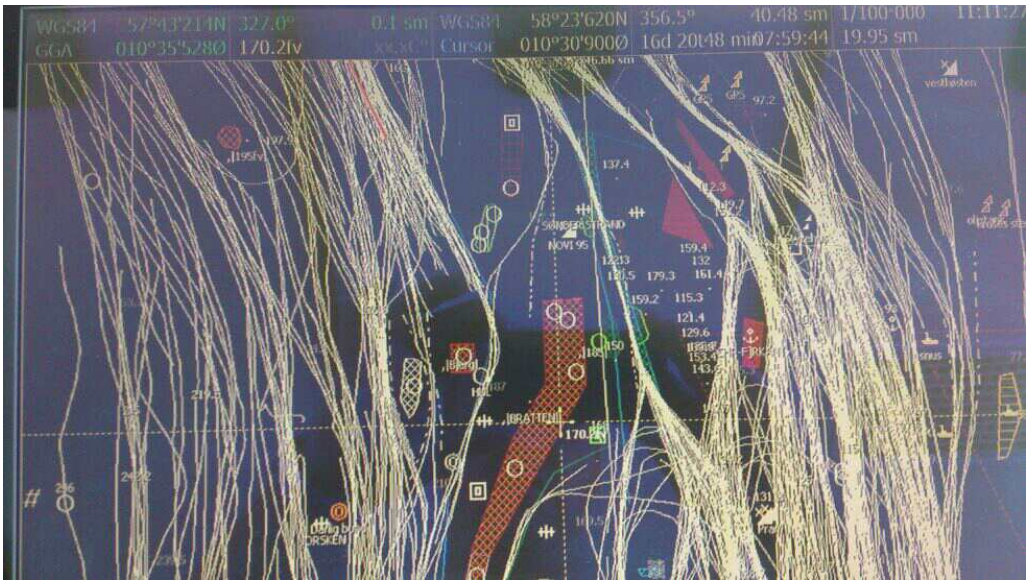
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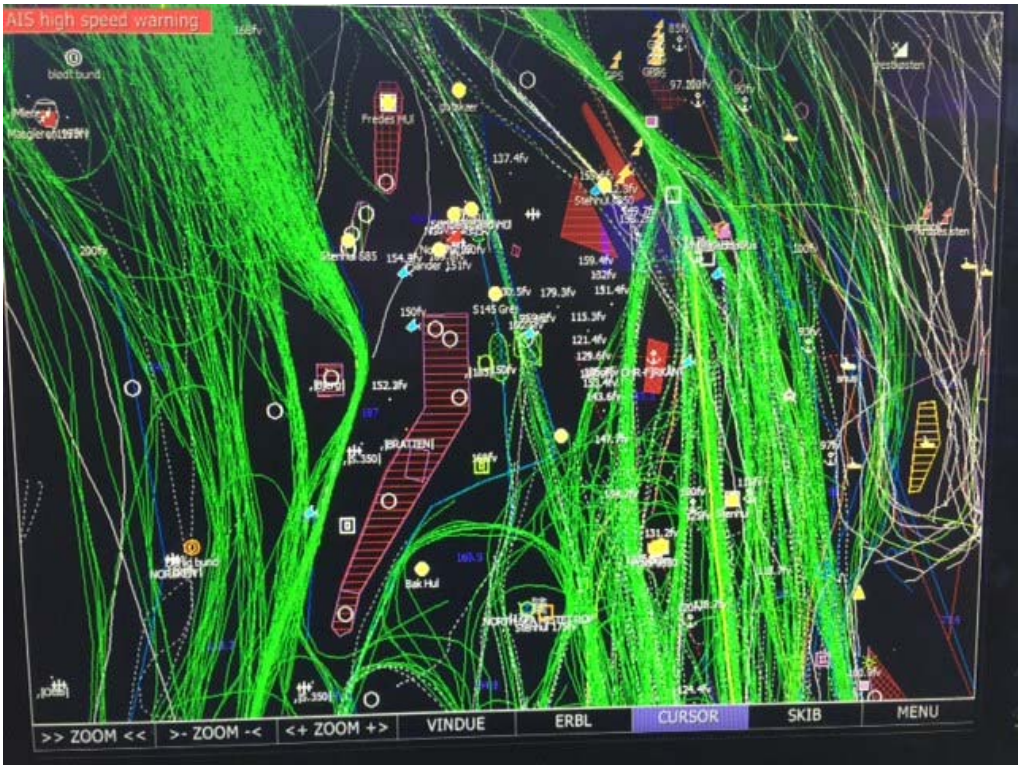

Figure 23. Distribution of fishing activity as described by plotter images from the wheelhouse of three different Danish vessels fishing in the Bratten area

(Source: Mikkel Knudsen, Launis Fiskekonserves A/S)

The overall pattern of fishing activity is similar to that described by the VMS data for the Swedish fleet in the Bratten area in relation to the proposed closed areas (Figure 26).

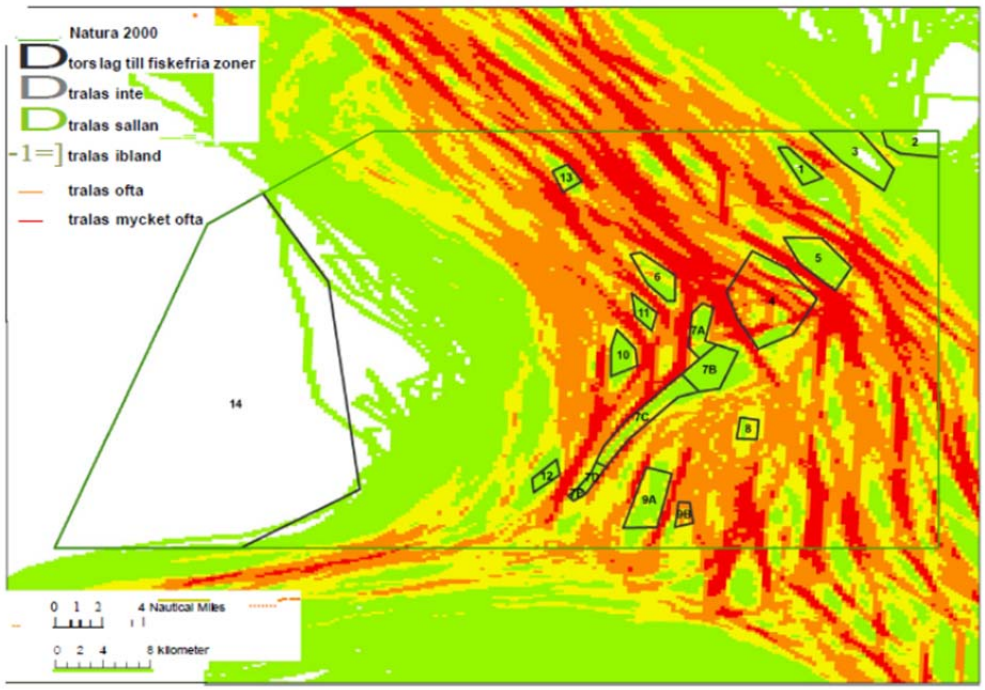

Figure 24. VMS data for Swedish vessels for 2010-2102 (screened to exclude vessel speeds greater than 3 knots) in relation to proposed closed areas in the Bratten. (Source: Kilnäs, 2013)

Other measures within the proposed management plan for the Bratten area include:

- Release of elasmobranchs
- Protection of halibut during the spawning-period
- Fishing charts
- Catch registration
- Education/knowledge transfer
- Development of gentler gears
- Fishery monitoring

3.4.8 Ecosystems

Fisheries can impact on the ecosystem in a variety of different ways. Fisheries can remove the target species, other retained and by-catch species and ETP species, and fishing gear can impact on the habitat. These impacts have been considered previously under previous sections of P1 and P2, and one potential impact of the fishery to consider that has not been covered previously is the impact on trophic relationships of removal of shrimps.

A guiding principle of EU fisheries policy is that the precautionary and ecosystem approach should be incorporated within fisheries management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help coordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE).

ICES provides an annual overview of the state of the North Sea Ecosystem. ICES Mixed fisheries advice report for the North Sea (which includes Skagerrak, but not the Kattegat) gives an overview of the stocks of different species and marks a path towards ecosystem management (ICES, 2014e). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2014/2014/mix-nsea.pdf

Food webs and trophic relationships of the North Sea are the subject of ongoing research and investigation, and much of this research is reported in ICES Working Group reports and used by those Working Groups.

There is considerable knowledge of the habitats and ecosystem of the Skagerrak and Kattegat Seas, based on a century of regular monitoring and research, the intensity of which has accelerated in recent decades. There has been a wide range of studies examining the fish community structure particularly in the North Sea and these studies confirm that shrimp is a low level trophic species. Numerous fish and marine mammal species are predators of *P. borealis* (Parsons, 2005) and predation mortality is thought to be an important factor in shrimp stock dynamics, although predator abundance varied little over the last ten years in the Skagerrak and North Sea ecosystem (NAFO / ICES, 2015) and so it is not possible to ascertain how the shrimp stocks will respond to large variations in predator abundance.

Legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations, such as the EU-Norway discard ban agreement for the Skagerrak Sea which was endorsed by the European Parliament in April 2013, and will come in to effect on 1 January 2016.

There are a wide range of measures in place that should minimise the impact of the fishery on the ecosystem. There are catch quotas for the shrimp fishery, fishing effort is closely regulated and fishing regulations enforced, the use of selective gears is mandatory, Swedish, Danish and Norwegian fisheries agencies collaborate and Natura2000 sites have been established.

The Mackinson & Daskalov (2007) Ecopath model of the North Sea (which includes the Kattegat) http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf is able to answer questions such as the response of the ecosystem to changes, and can be used as a basis in the design of policies aimed to implement ecosystem management principles, and can provide testable insights into changes that have occurred in the ecosystem over time.

Data continue to be collected in Denmark and Sweden through scientists, management organisations and the various NGOs who have an interest in the Skagerrak and Kattegat ecosystems. Analysis of these data contributes to the detection of any change or increase in the risk level to the main ecosystem components.

Under the EU Marine Strategy Framework Directive (MSFD), the objective is to achieve Good Environmental Status (GES) of marine waters by 2020. To help Member States interpret what GES means in practice, the Directive sets out a series of qualitative descriptors which describe what the environment will look like when GES has been achieved. Of particular relevance are Descriptor 3 which concerns the healthy status of fish and shellfish stocks and Descriptor 4 which concerns trophic relationships and marine food webs. To help meet these requirements and other international environmental targets, in 2013 Norway published a Management Plan for the North Sea and Skagerrak (Norwegian Ministry of Environment, 2013). The purpose of this management plan is "*to provide a framework for the sustainable use of natural resources and ecosystem services derived from the North Sea and Skagerrak and at the same time maintain the structure, functioning, productivity and diversity of the area's ecosystems*.". The scientific basis of the management plan was prepared by an Expert Group with representatives from all the key scientific organisations and includes proposals for a set of indicators to be used in a coordinated monitoring programme for the North Sea and Skagerrak ecosystems. The report suggests reference values and action thresholds for the indicators and suitable monitoring stations and survey transects, based on existing time series where possible (Institute of Marine Research, 2013). State indicators include physical and chemical parameters, plankton, benthic fauna, fish stocks, marine mammals, seabirds, threatened species, alien species, occupation of areas and pollution. In addition to these state indicators, there are pressure indicators prosed for the petroleum, fisheries, maritime traffic and other sectors. For the fisheries sector, the proposed pressure indicators are harvest level, bottom trawling activity, size index and bycatch including bycatch of threatened species.

http://ec.europa.eu/environment/marine/good-environmental-status/index_en.htm

3.5 Principle Three: Management System Background

The Norwegian shrimp fishery takes place in ICES Area IVa (Northern North Sea) and ICES Area IIIa (Skagerrak and Kattegat). It is managed at national level in Norway and under the EU–Norway framework agreement on the management of fish stocks in the North Sea, Skagerrak and Kattegat.

3.5.1 Management objectives

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. The 2007 NEAFC Convention also requires the precautionary principle to be used.

3.5.2 Management system

At the international level, shrimp is managed through annual agreements between Norway and EU on the regulation of fisheries in the North Sea and on the Skagerrak and the Kattegat. These are based on the Framework Agreement between the EU and Norway Council Regulation ((EEC) 2214/80 of 27 June 1980).

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 Trade, Industry and Fisheries, 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 Trade, Industry and Fisheries and the Ministry of Environment. The national 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, at the national level, insofar as it constitutes a coherent set of rule-making practices.

The Ministry of Trade, Industry and Fisheries 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 sales organizations are also obliged to keep track of landings and cooperate tightly with the Directorate of Fisheries. 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.

Unlike most other Norwegian fisheries, the shrimp fishery is not regulated by vessel quotas but by periodic regulation. There is an Olympic fishery within three seasons: January–April, May–July and August–October, with a maximum total quota for the period and a maximum quota for each vessel. For instance, in 2015 the maximum shrimp quota for each period was set at 1,881 tonnes, while the maximum vessel quota per period was 25 tonnes. Vessels below 20 meters can continue fishing up to 7 tonnes above each group periodic quota.

3.5.3 Consultation

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 organizations. 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 and NGOs attend on a regular basis. In addition there is day-to-day contact by telephone and email between authorities, user-groups and other interested parties.

User-groups such as the Norwegian Fishermen's Association also participate at the international level, e.g. in the annual negotiations between Norway and EU. Norwegian management authorities actively seek advice from user-groups in preparation for all international consultations and negotiations.

The situation is similar at the international level, where user groups participate as full delegation members in the EU–Norway negotiations, while NGOs may participate as observers at meetings in regional organizations such as NEAFC and OSPAR.

3.5.4 Monitoring, Control and Surveillance (MCS)

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, or more specifically Electronic Reporting Systems (ERS). This implies that real-time data are forwarded to the Directorate of Fisheries, with the possibility to make corrections of data submitted each day within 12 hours into the next day. Norway has agreements in place with the EU, Russia and Iceland about exchange of ERS data, and is working actively to reach agreement on similar arrangements with the Faroe Islands and Greenland. 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. They check, among other things, weighing equipment, quantity and size distribution of the catch, the quality of the fish and documentation. 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. All landings have to be reported six hours in advance in order to give the inspectors the possibility to check the landed catch. The landed volumes are compared to the volumes reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment.

The Coast Guard is administratively part of the Norwegian Navy but performs tasks on behalf of several ministries, including the Ministry of Trade, Industry and Fisheries. 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.

4 EVALUATION PROCEDURE

4.1 Harmonised Fishery Assessment

There are several fisheries targeting *Pandalus borea*lis which are already MSC Fisheries certified or undergoing certification process. Several of these fisheries take place in the North West Atlantic and do not intersect with the Norwegian cold water prawn fishery which takes place in the North East Atlantic. In the North East Atlantic an important fishery for cold water prawn takes place in the Barents Sea. The Norwegian, Estonian and Faroese fisheries for cold water prawn in the Barents Sea have been certified. The team has considered that there is not much overlap between Barents Sea and North Sea, Skagerrak and Kattegat cold water prawn fisheries. The fishing area and the management systems are different which implies that scores for P1 and P3 could remarkably differ. For P2 the fact that the by-catch species, habitats and ecosystem of the Barents Sea are different from the North Sea also implies that there is no need for harmonisation.

There are two other fisheries for cold water prawn in the Skagerrak, Kattegat and Norwegian Deep area that have been undergoing MSC assessment. The Swedish Skagerrak, Kattegat and Norwegian Deep cold water prawn fishery has already been certified, and the Danish Skagerrak and Norwegian Deep cold water prawn fishery is undergoing assessment currently.

The Norwegian fishery assessment will therefore need to be harmonised with the Swedish and Danish fisheries. A comparison of outcomes (scores and conditions) between the Norwegian, Danish and Swedish cold water prawn fisheries within the MSC system is provided in Table 13 below.

A brief indication of any differences of ⩾15 in the score between the Norwegian and other fisheries is provided. A difference of 5-10 in the score between fisheries may be due to interpretation of the assessment teams, and has not been commented on unless it resulted in a condition being set on one fishery only.

Table 13 Performance indicator scores for cold water prawn fisheries in Skagerrak and Norwegian Deep. Yellow highlighted scores indicate where there was a difference in score of ≥15 between fisheries.

Component	PI No.	Performance Indicator (PI)	**Norwegian fishery**	Danish fishery	Swedish fishery
Outcome	1.1.1	Stock status	80	80	80
	1.1.2	Reference points	80	80	80
	1.1.3	Stock rebuilding	N/A	N/A	NA
Management	1.2.1	Harvest strategy	80	80	80
	1.2.2	Harvest control rules & tools	65	65	65
	1.2.3	Information & monitoring	90	90	90
	1.2.4	Assessment of stock status	90	90	90
Retained species	2.1.1	Outcome	80	80	80
	2.1.2	Management	80	100	95
	2.1.3	Information	80	80	85
By-catch species	2.2.1	Outcome	80	80	80
	2.2.2	Management	90	80	80
	2.2.3	Information	75	75	75
ETP species	2.3.1	Outcome	80	80	80
	2.3.2	Management	80	80	80
	2.3.3	Information	80	80	80

Habitats	2.4.1	Outcome	75	75	75
	2.4.2	Management	75	75	75
	2.4.3	Information	75	75	75
Ecosystem	2.5.1	Outcome	80	80	80
	2.5.2	Management	90	90	80
	2.5.3	Information	85	85	85
Governance and policy	3.1.1	Legal & customary framework	95	95	100
	3.1.2	Consultation, roles & responsibilities	95	95	95
	3.1.3	Long term objectives	100	100	90
	3.1.4	Incentives for sustainable fishing	100	80	80
Fishery specific management system	3.2.1	Fishery specific objectives	90	100	80
	3.2.2	Decision making processes	100	85	80
	3.2.3	Compliance & enforcement	85	100	70
	3.2.4	Research plan	80	80	80
	3.2.5	Management performance evaluation	90	90	80

There are five performance indicators for which the scores differ by 15 or more points or where a condition has been raised for one fishery but not the other fisheries. For PI 2.1.2, there is no regulation requiring the use of the sorting grid within the 4nm zone, and thus there is no strategy for managing all retained species in the Norwegian fishery, and so the Norwegian fishery scored lower than the Danish and Swedish fisheries. For 3.1.4 incentives are more expressly and explicitly considered in the Norwegian than the Danish and Swedish systems. For 3.2.1 both Danish and Swedish fisheries are managed under the CFP, but there are separate national management regimes for the two fisheries, and there is also a separate management regime in Norway. Well defined and measurable short and long-term objectives consistent with achieving the outcomes of MSC Principles 1 and 2 are explicit in the Norwegian Marine Resources Act and supporting legislation on the Norwegian shrimp fishery. Similarly the Danish Fisheries and Aquaculture Act and supporting legislation on the Danish shrimp fishery are considered to be well-defined and measurable, whereas the short and long term objectives formulated under the Swedish programme for the fisheries sector 2007-2013 are not considered to be measurable against well-defined targets. Under 3.2.2, the assessment team has been provided with solid documentation that all issues are responded to in formal reporting in the Norwegian management system, which seems to a lesser extent to have been the case for the Danish and Swedish systems. For 3.2.3, significant compliance problems were identified in the Swedish fishery in relation to the enforcement of the prohibition on high-grading, and thus a condition was raised against this PI. No such systematic non-compliance was identified in the Norwegian or Danish fisheries.

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4.2 Previous assessments

There have been no previous assessments for this fishery.

4.3 Assessment Methodologies

The basis for the MSC-certification is the standard denoted as the MSC Fishery Standard - Principles and Criteria for Sustainable Fishing, v 1.1, 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;

- 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 was carried out using MSC Certification Requirements v1.3. The assessment team used the default assessment tree without adjustments as defined in the MSC Certification Requirements v1.3. The MSC Full Assessment Reporting Template V1.3 is used as basis 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[1]:

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:

- 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.

[1] 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.

- 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.
- 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 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

- The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.
- The management system shall:
- 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.
- 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.
- 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.
- Incorporates an appropriate mechanism for the resolution of disputes arising within the system[2].
- Provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing.
- 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.
- 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.

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

- Require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted.
- Specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
    - 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.
    - Identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.
    - Providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames.
    - Mechanisms in place to limit or close fisheries when designated catch limits are reached.
    - Establishing no-take zones where appropriate.
- 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:

- 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.
- Implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.
- Not use destructive fishing practices such as fishing with poisons or explosives.
- Minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.
- Be conducted in compliance with the fishery management system and all legal and administrative requirements.
- 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).

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits

Relevant stakeholders have been identified and stakeholder meetings were scheduled and carried out as planned in Oslo and Bergen in May 2015. Persons consulted and key issues discussed during these site-visits are outlined in Table 14. Information gathered was used as a basis for this report and is presented throughout several chapters and in the scoring tables.

Table 14. Site visits conducted and key issues discussed

• Name	• Affiliation	• Date	• Key issues
Tor Bjørklund-Larsen, Norges Fiskarlag **NN, fisherman** **Kjell Arild Tøfte, Jan Bredsand, Skagerakfisk** **Gunnar Frogner Dahl, Tor steinar Fiskå, Rogaland Fiskesalgslag**	**Client representa-tives:** Norges Fiskarlag (Norwegian Fishermens Association) and fishermen Skagerakfisk Rogaland Fiskesalgslag	26.05.2015	**Info about client and the fishery** • History and organizational structure **Fishing operations**: • Fishing season • Fishing area • UoC Fleet • Fishing practices: o Gears used o Fishing area o Fishing depth o Historical fishing levels (quotas and landings) o Composition of catch o Info on discarding o Sampling and weighting on board o Closed areas o Loss of fishing gear **Impact on eco system:** • List of all by-catch of fish species: (species and quantities) • By-catch of marine mammals, ETP species, birds • List of commercial/non-commercial species which are usually discarded (quantities/if known) • Protecten or sensitive habitats within geographical range of target stock • Natura 2000 sites • Effect of gear used on the habitat • Reporting & registration of by-catch/discards • Sorting/separation of by-catch • Sampling **Management, compliance with rules and regulations** • Fishery management plans • Disputes with national/ international authorities for the last 5 years. • Records of sanctions and penalties in 2013,

			2014 and 2015 (if any).
			• Control & surveillance:
			  o VMS system
			  o Landing control
			  o Quota control
			  o Inspections on board
			• Participation in research projects
			• Amount and type of information provided to management bodies
			• Cooperation with management bodies
			• Management evaluation
			
			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

Modulf Overvik, Norwegian Fisheries Directorate **Guldborg Søvik, Institute for Marine Research**	**Authorities and research:** Norwegian Fisheries Directorate Institute for Marine Research	26.05.2015	**Management** • Fisheries Management & Regulations • Long-term objectives for Norwegian fisheries • Review of regulations for shrimp in ICES division IIIa and IVa East • Harvest strategy for shrimps • Observed fishing patterns (gear used, fishing area, number of boats, fishing season, VMS data). • Logbooks: recording of landings and discards (of non-commercial species) • Level of slipping/discards in shrimp fisheries. • Strategy for minimising or eliminating ETP by-catch • Strategy and plans for protection of sensitive habitats, Natura 2000 sites • Control, surveillance and monitoring • Fishermen's compliance with laws and regulations • Significant discrepancies found at landing control for shrimp fisheries in 2012/2015. • Consultation and decision-making process • Mechanisms for resolution of legal disputes • Research programmes and strategic planning • Evaluation of management system **Research** • Stock status, stock structure and recruitment • Review of Limit and Target reference points established for the stock • Approach to stock assessments • Research programmes for the shrimp fishery under assessment • Sampling programmes and level of sampling • Level of discarding (composition of species, quantities) • Level of by-catch (composition of species, quantities)

			• Monitoring programmes for ETP species. Can the extent of interactions with ETP species be quantified? • Impact of fisheries on ecosystem • Impact of fisheries on marine habitats • Research planning
Paul Magnus Oma and Geir Ervik	**Authorities:** Norwegian Ministry of Industry, Trade and Fisheries	27.05.2015	**Management/politics** • Fisheries Management & Regulations • Long-term objectives for Norwegian fisheries • Review of regulations for shrimp in ICES division IIIa and IVa East • Harvest strategy for shrimps • Level of discards in shrimp fisheries. • Strategy for minimising or eliminating ETP by-catch • Strategy and plans for protection of sensitive habitats, Natura 2000 sites • Control, surveillance and monitoring • Fishermen's compliance with laws and regulations • Significant discrepancies found at landing control for shrimp fisheries in 2012/2015. • Consultation and decision-making process • Mechanisms for resolution of legal disputes • Research programmes and strategic planning • Evaluation of management system
Fredrik Myhre	**NGOs:** WWF	27.05.2015	• Stock status • Impact on the ecosystem o Impact on associated fish stocks o Interaction with ETP species o Impact of fishery on ETP species o Impact of fishery on ecosystem o Impact of fishery on marine habitats • Programmes for protection of ETP species & habitats • Relevant research projects • Engagement of stakeholders

4.4.2 Consultations

Information on the assessment process was made publicly available through www.msc.org at given stages of the assessment as outlined in Table 15. In addition to that, all relevant stakeholders identified at the beginning of the assessment (95 stakeholders) were reached through direct e-mails and given a possibility to monitor the assessment process and provide a feedback to the assessment team.

Information gathered during the site visits and through contact with the stakeholders after the site visit formed the main basis of the stakeholder consultancy for this assessment (ref. section 4.4.1 above). No written submissions were received from other stakeholders.

Table 15: Consultations during assessment process

Date	Information	Media
26 March 2015	Notification of Full assessment	Notification on MSC website Direct E-mail
26 March 2015	Notification of Assessment Team	Notification on MSC website Direct E-mail
9 April 2015	Confirmation of Assessment Team	Notification on MSC website Direct E-mail
9 April 2015	Announcement of use of Default Assessment Tree	Notification on MSC website Direct E-mail
12 May 2015	Confirmation of use of Default Assessment Tree	Notification on MSC website Direct E-mail
Week 15 2015	Advertisement of certification + Invitation to contribute to assessment process	Advertisement on www.intrafish.com
9 April 2015	Stakeholder Notification: Site Visit scheduled	Notification on MSC website Direct E-mail
30 June 2015	Nomination of peer reviewers	Notification on MSC website Direct E-mail
4 August 2015	Confirmation of peer reviewers	Notification on MSC website Direct E-mail
30 June 2015	Variation request: Change in UoC and fishery name	Notification on MSC website Direct E-mail
30 June 2015	Variation response: Change in UoC and fishery name	Notification on MSC website Direct E-mail
15 December 2015	Revised timeline	Notification on MSC website Direct E-mail
25 February 2016	Notification of Public Comment Draft Report	Notification on MSC website Direct E-mail
4 May 2016	Revised timeline	Notification on MSC website Direct E-mail
12 May 2016	Notification of Final Report	Notification on MSC website Direct E-mail

4.4.3 Evaluation Techniques

The full assessment was publicly announced on 26 March 2015 through www.msc.org and supplemented with advertisements on www.intrafish.com week 15, 2015. Assessment team chose to announce the assessment in English on www.intrafish.com to secure worldwide coverage of potential stakeholders.

At the beginning of the assessment, the assessment team compiled a stakeholder list based on guidance from the client and team member experience with other assessments of Norwegian fisheries. The list

covers over 40 stakeholders and has been used at every stage of the consultation process undertaken for the Norwegian Skagerrak and Norwegian Deep cold water prawn fishery.

The site visit took place 26-27 May 2015 in Oslo and Bergen, Norway. All members of the assessment team specified in section 2.1. were present at all meetings held. Stakeholder consultations were performed in the form of direct meetings. Information on meetings participants and issues discussed can be found in Table 18. Some additional information was received from the stakeholders and the client after the site visit.

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 during the scoring meetings which took place in Oslo on 28 May, 2015, and in e-mail correspondence and telephone meetings in the following months.

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

- The fishery must obtain an average 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 do some further improvements regarding these points and describe the actions that will be taken in a client action plan. The certification body (here DNV) sets a timescale for the fishery to improve the relevant areas.

The Norway Skagerrak and Norwegian Deep cold water prawn 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 Skagerrak and Norwegian Deep cold water prawn fishery for the client Norges Fiskarlag.

In the assessment process a number of PIs scored more than 60 but less than 80. For these PIs the team has drafted conditions. Full explanation of these conditions is provided in Appendix **1.2** of the report.

Default performance indicators and the scores allocated in the evaluation are enclosed in section 6.2. The set of scoring elements that have been considered in each outcome PI in Principle 2 are included in Table 16.

Table 16. Scoring elements

Component	Scoring elements	Main/not main	Data-deficient or not
Retained species	Cod	Main	Not DD
	Saithe	Main	Not DD
	Witch	Not main	N/A
	Angler fish	Not main	N/A

	Haddock	Not main	N/A
	Hake	Not main	N/A
	Ling	Not main	N/A
	Norway lobster (*Nephrops*)	Not main	N/A
	Whiting	Not main	N/A
Bycatch species	Blue whiting	Not main	N/A
	Norway pout	Not main	N/A
ETP species	Thorny skate	N/A	N/A
	Basking shark	N/A	N/A
	White shark	N/A	N/A
	Common skate	N/A	N/A
	Smooth lanternshark	N/A	N/A
	Porbeagle	N/A	N/A
	Reef manta ray	N/A	N/A
	Giant manta ray	N/A	N/A
	Mobula rays	N/A	N/A
	Harbour porpoise	N/A	N/A
	Sawfish	N/A	N/A
	Thornback ray	N/A	N/A
	Guitarfishes	N/A	N/A
	Angel shark	N/A	N/A
	Spurdog / spiny dogfish	N/A	N/A
Habitat	Coral gardens	N/A	N/A
Habitat	Deep sea sponge aggregations	N/A	N/A
Habitat	*Zostera* beds	N/A	N/A
Habitat	*Lophelia pertusa* reefs	N/A	N/A
Habitat	Seapen and burrowing megafauna	N/A	N/A

4.4.4 Risk Based Framework

The Risk Based Framework (RBF) is designed for use with the default assessment tree specifically with Principle 1 outcome PIs, but also Principle 2 outcome PIs, and was adopted by the MSC to enable scoring of fisheries in data-deficient situations.

There are sufficient data available to estimate stock status for Northern shrimp and the impact of the fishery on ecosystem components (retained species, discarded species, ETP species, habitats and ecosystems). Therefore the Northern shrimp fishery under assessment is not considered a data deficient fishery and the use of the Risk Based Framework is not invoked in this assessment.

5 TRACEABILITY

5.1 Eligibility Date

The **Target Eligibility Date** for this fishery is 1 November 2015.

The target eligibility date (TED) is the expected date of eligibility for products from fishery to enter the Chain of Custody and thus be permitted to bear the MSC ecolabel. Fishing is all year around. In order to allow the client to take advantage of the opportunity to set the TED up to a maximum 6 months prior to the publication of the Public Comment Draft Report, the TED is set to 1 November 2015. The traceability and segregation systems in the fishery has been in place from this date.

5.2 Traceability within the Fishery

5.2.1 Description of the tracking, tracing and segregation systems within the fishery.

Traceability up to the point of first sale has been scrutinised as part of this assessment and it is concluded that the system of tracking and tracing in the Norway Skagerrak and the Norwegian Deep Cold Water Prawn fishery is adequate to ensure that all shrimps originating from the certified fishery, and sold as certified, could be identified prior or at the point of sale.

All the shrimps landed from Norwegian boats are originating from vessels having a licence from the Norwegian authorities and are included in the unit of certification. The vessels only have quota for the area included in UoC. In Norway vessels larger than 15 meters are required to have a VMS (Vessel Monitoring System) and AIS (Automatic Identification System) in place which reports on an hourly basis to the Directorate of Fisheries. In Skagerrak all vessels that are 12 meters and larger have VMS. According to a new regulation in Norway the smallest vessels must record their catches using an “app” on their smart phones, which will also provide fishing location in a similar way to VMS on the larger vessels.

All vessels in this fishery larger than 15 meters are required to complete an electronic log book. In Skagerrak also vessels from 12 meters and larger are using electronic log book. The smallest vessels are using the “app” for smart phones for recording the catches. The catch information is sent to the authorities once a day. Maximum allowed deviation between weight information from vessels and the weighing by landing (sales note) is 10%.

The vessels have to report to the authorities 2 hours before landing to secure proper control.

Most of the catches are packed, either raw or boiled, in boxes on board and stored in the cold room. An exception is for the smallest vessels, where the boiled shrimps are packed by landing. The boiled shrimps are re-packed at the landing place.

At landing in Norway the products are weighed and the fishermen must fill out a sales note providing information about date, vessel identification, species, size and weight. The data are instantly reported to the authorities, providing high quality input for resource control purposes and also a check against the catch data from the log books (apps). Also the packaging are labelled with product, vessel identification, catch area, catch date, weight, size, production date and other information.

The shrimps are mainly landed in Norway, but a few vessels are landing in Sweden and very rarely in Denmark. The boiled shrimps landed in Norway are sold directly to buyers licenced by the Directorate of Fisheries. About 20% of the landed boiled shrimps are exported directly with the sales organizations acting as an intermediate body. When landing in Sweden or Denmark the boiled shrimps are sold to local fish auctions, where there is a control of compliance between the landing notes and the load.

About 99% of the raw shrimps are landed in Norway, of which about 45% are sold to the same buyers as the boiled shrimps for further sale to the peeling factories and the rest is sold directly to peeling factories in Norway and abroad with the sales organizations acting as an intermediate body. One percent of the landed raw shrimps are landed in Sweden (or Denmark) for sale to the peeling factories. When arriving at the peeling plants in Sweden or Denmark the load is weighed or registered in other ways, and this can be checked against the vessel´s log books .

When packed raw shrimps are transported from landing points (buyers) to the peeling plants the conveyer has to get a packing note showing the vessel name, number of boxes and the size grade of the product. The buyer on his side has to send a copy of the packing note to the processing plant. When the shrimps are exported directly, this is handled by the sales organizations.

The sales organizations in Norway are not chain of custody certified in accordance with MSC, but the buyers are. The sales organizations role is an intermediate body between the vessel owner and the buyer.

5.2.2 Risk of the possibility of vessels fishing outside the unit of certification

There is no elevated risk of vessels fishing outside the UoC. The vessels only have quota for the area included in UoC (Skagerrak and Norwegian Deep). All Norwegian vessels larger than 15 meters must have Vessel Monitoring System (VMS), and boats in Skagerrak of 12 meters and larger have VMS. The smallest vessels must record their catches using an “app” on their smart phones, which will also provide fishing location in a similar way to VMS on the larger vessels.

5.2.3 Risk of substitution of certified fish with non-certified fish prior to and at the point of sale

There is no risk of substitution of certified with non-certified catch. All the cold water prawns caught by the Norwegian vessels will be MSC certified and all Norwegian vessels targeting cold water prawn are included in the UoC. Thus there is no risk that non-certified cold water prawn will be on board of UoC vessels that could be mixed with certified cold water prawn. The Chain of Custody certification processes will address risks of substitution taking place later in the supply chain.

If there should be landings of non-certified prawns by foreign vessels, the system with landings/sales notes, which include information about vessel (also nationality), fishing area, etc., will disclose this and substitution of certified with non-certified prawns at the point of landing or sale will be avoided. All the sale of prawns on the first hand is conducted by the sales organisations. During the last three years no foreign shrimp vessels have been registrated in Norwegian landing points.

Due to the strict system of control, monitoring and enforcement, there is no opportunity for the client fleet to substitute certified shrimp products with non-certified prior to or at the point of sale. All Norwegian shrimp catches taken in the UoC are properly reported, labelled and recorded.

5.2.4 At-sea processing of catch

All the shrimps are graded and most of them are packed on board. Prior to packaging a part of the catch is boiled while the rest is packed in raw condition. A minor part of the boiled shrimps (the smallest vessels) are packed at landing because of lack of packaging system on board. The portion of boiled shrimps is about 50-60%.

The raw shrimps are iced before packing in 17 kilo plastic boxes. The boxes get stacked on pallets, and the pallets are labelled with vessel identification, catch date and sorting (shrimp size) after weighing and filling out the sales note.

The boxes for boiled shrimps are 15 kilos plastic boxes, but are re-packed into styrofoam boxes after weighing at the landing place and then labelled with product, vessel identification, catch area, catch date, weight, size, production date and other information.

The boxes with boiled shrimps have labels with a bar-code and provide information including:

- Product
- Vessel identification number
- Catch area
- Size
- Net weight
- Production date

The label is shown in Figure 25

Figure 25 Label on the boxes with boiled cold water prawns

Sometimes the vessels catch a limited amount of king shrimps and white shrimps together with the target species cold water prawns. These are however small amounts and are separated from the cold water prawn on board. These other species could never be mixed with the landed cold water prawn since they look different and a product with a mix of different species could never be sold. The white shrimps are not used and the king shrimps are used directly on board.

5.2.5 Trans-shipment

There are no transhipment activities in this shrimp fishery.

5.2.6 Number and/or location of points of landing

The boiled and raw shrimps are landed at 22 landing points along the coast in Norway; 17 in Skagerrak and 5 in Rogaland. In case of landing outside Norway, there are 2 landing points in Sweden and 2 in Denmark.

The landing points in Norway include about 20 places along the Norwegian coast, whilst the landing points in Sweden are Gothenburg and Strømstad. Landing points in Denmark are Hirtshals and Hansholm.

The cold water prawns landed by Norwegian vessels are sold through or by approval from the sales organizations in Norway. The sales organizations that are relevant for the cold water prawns originating from Skagerrak and the Norwegian Deep are:

- Rogaland Fiskesalgslag
- Skagerakfisk

5.2.7 Robustness of the management systems related to traceability.

The management system supporting traceability comprises:

- Mandatory use of VMS on all Norwegian vessels larger than 15 meters, mandatory use of VMS on vessels of 12 meters or larger in Skagerrak and mandatory use of an “app” on smart phones reporting about position on other vessels. This ensures that the vessels are operating inside the UoC
- Use of electronic log books for vessels in the same way as VMS, and also use of an “app” for recording the catch. The catches are reported to the authorities (prior notification of landings)
- Mandatory to prepare sales note at landing for further reporting to the authorities. The sales notes are checked against the log books, and max allowed deviation is 10%.
- When packed raw shrimps are transported from landing point (buyer) to the processing plant the conveyer has to get a packing note showing the vessel name, number of boxes and the size grade of the product. The buyer on his side has to send a copy of the packing note to the processing plant. When the shrimps are exported directly this is handled by the sales organizations.
- There are also regular inspections from the authorities
- The system allows for cross-checking declared landings, intake and sale

The systems in place are comprehensive and mandatory, and the enforcement gives a robust system that supports full traceability for the landed product.

5.3 Eligibility to Enter Further Chains of Custody

Pandalus borealis products landed by Norwegian vessels having a licence from the Norwegian authorities and originating from Norway Skagerrak and the Norwegian Deep cold-water prawn fishery conducted by bottom trawlers in ICES divisions IIIa and IVa East, and operating under shrimp quota issued by authorities in Norway, will be eligible to enter Chain of Custody and carry MSC logo in case of successful certification.

The Chain of Custody will commence following sale of raw or boiled *Pandalus borealis* products at the points of landing.

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

MSC TAB Directive-030 v1 concerns the use of the MSC eco-label on catches of inseparable stock(s). It applies when catches of the target stock (in this case *Pandalus borealis*, assessed under P1) are inseparable or practicably inseparable (IPI) from catches of stocks assessed under Principle 2, but for which there is no separate certification of the species considered to be IPI and which might enter into further certified CoC.

For the purposes of this TAB Directive, 'inseparable' refers to situations where the target stock and non-target stock cannot be distinguished during normal fishing operations.

As described above the other shrimp species caught by the UoC vessels can be easily distinguished from *Pandalus borealis* by the crews on board of the vessels. These shrimp are sorted from the catch on board.

Therefore in this fishery there are no Inseparable or Practically Inseparable species in this fishery.

6 EVALUATION RESULTS

6.1 Principle Level Scores

Table 18 Final Principle Scores.

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species	80.6
Principle 2 – Ecosystem	80.3
Principle 3 – Management System	93.3

6.2 Summary of Scores

Table 19 Performance indicator scores

Component	PI No.	Performance Indicator (PI)	Score
Outcome	1.1.1	Stock status	80
	1.1.2	Reference points	80
	1.1.3	Stock rebuilding	N/A
Management	1.2.1	Harvest strategy	80
	1.2.2	Harvest control rules & tools	65
	1.2.3	Information & monitoring	90
	1.2.4	Assessment of stock status	90
Retained species	2.1.1	Outcome	80
	2.1.2	Management	80
	2.1.3	Information	80
By-catch species	2.2.1	Outcome	80
	2.2.2	Management	90
	2.2.3	Information	75
ETP species	2.3.1	Outcome	80
	2.3.2	Management	80
	2.3.3	Information	80
Habitats	2.4.1	Outcome	75
	2.4.2	Management	75
	2.4.3	Information	75
Ecosystem	2.5.1	Outcome	80
	2.5.2	Management	90
	2.5.3	Information	85
Governance and policy	3.1.1	Legal & customary framework	95
	3.1.2	Consultation, roles & responsibilities	95
	3.1.3	Long term objectives	100
	3.1.4	Incentives for sustainable fishing	100
Fishery specific management system	3.2.1	Fishery specific objectives	90
	3.2.2	Decision making processes	100
	3.2.3	Compliance & enforcement	85
	3.2.4	Research plan	80
	3.2.5	Management performance evaluation	90

6.3 Summary of Conditions and Recommendations

Table 20 Summary of Draft Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/N/A)
1	Well defined harvest control rules (HCRs) shall be implemented for the shrimp stock to ensure that the exploitation rates are reduced as limit reference points are approached. The HCRs should take into account the uncertainties underlying the assessment of stock status and the uncertainties in estimates of discard rates.	**1.2.2**	**N/A**
2	Evidence should be provided of the level of discarding in inshore areas for vessels which do not use a grid, and appropriate measures to provide better evidence of the level of discarding should be implemented.	**2.2.3**	**N/A**
3	Evidence should be provided that demonstrates that the shrimp fishery is highly unlikely to reduce coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm	**2.4.1**	**N/A**
4	Specific management measures which minimize the impact of fishing activities on habitat within designated protected areas should be implemented.	**2.4.2**	**N/A**
5	Information on interactions of fishing operations with VME habitats should be collected on a continuous basis.	**2.4.3**	**N/A**

6.3.1 Recommendations

Recommendation 1

The assessment team recommends the client to liaise with research scientists and gear technologists in the framework of the NORDEN project. This would better ensure that the project is carried out on a practical basis in a way that fishers could easily implement any desirable technical gear modifications to significantly reduce the capture of small shrimp. The clients could also offer assistance with gear trials on their vessels.

Recommendation 2

The length-based model and the surplus production model provide similar estimates of stock biomass but, in some years, significantly different estimates of fishing mortality.

The assessment team therefore recommends that further research is undertaken to resolve the differences in fishing mortality generated by the length-based and surplus production assessment models.

Recommendation 3

The assessment team **recommends** that the use of a sorting grid should be mandatory within the 4 nm limit

Recommendation 4

The assessment team **recommends** that systems are put in place to ensure that all ETP species are recorded on log books irrespective of whether they are landed or discarded and that the captures of all ETP species are mapped.

6.4 Draft Determination, Formal Conclusion and Agreement

The Norway Skagerrak and Norwegian Deep cold water prawn 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 Skagerrak and Norwegian Deep cold water prawn fishery for the client Norges Fiskarlag.

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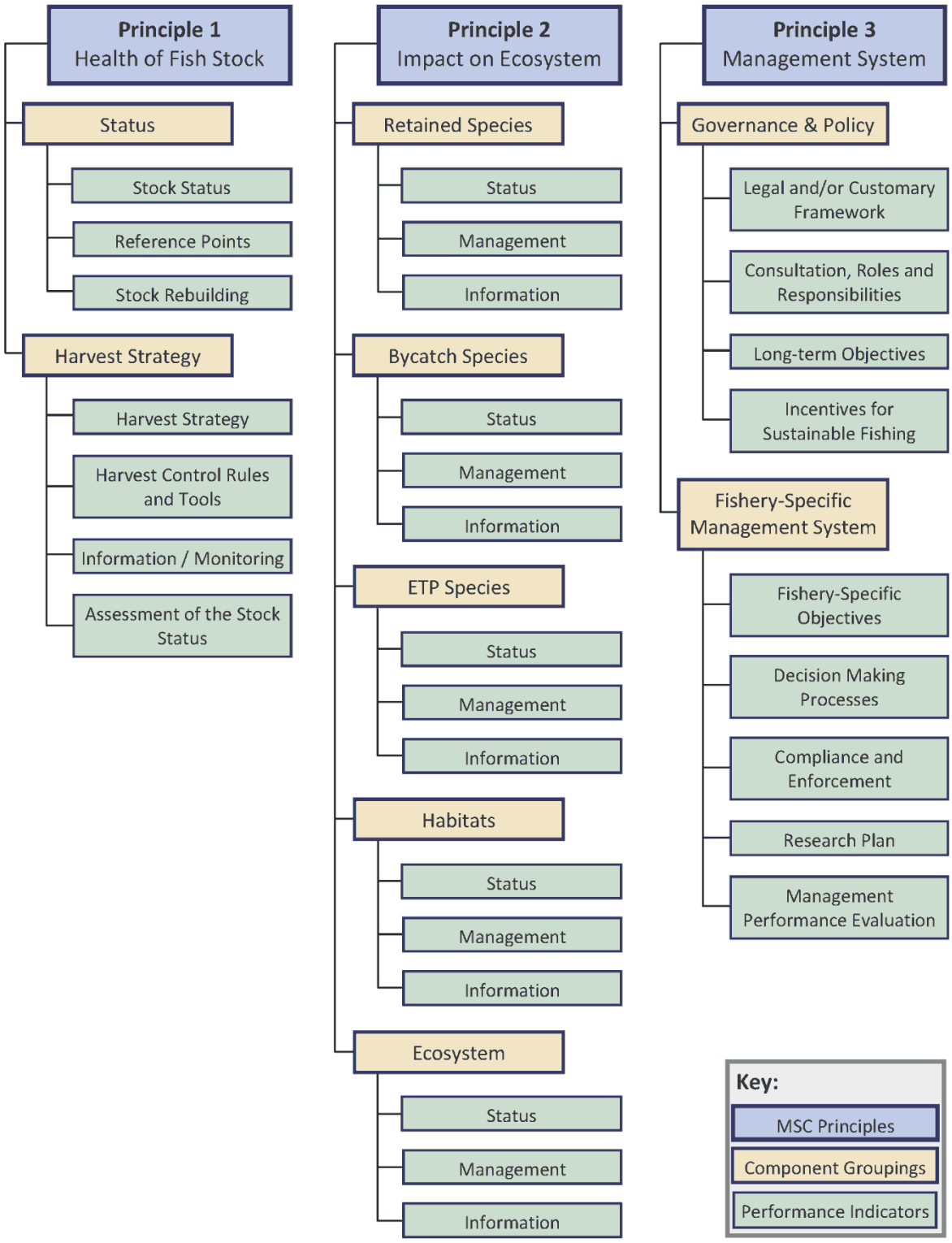
APPENDIX 1 SCORING AND RATIONALES

Appendix 1a – MSC Principles



Figur A1 – Graphic of MSC Principles and Criteria

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	N
	Justification	The surplus production model described in the NAFO/ICES Pandalus Assessment Group (NIPAG) report for 2015 estimated that stock biomass (despite a significant decline from 2006 to 2011) has been significantly above MSY Btrigger and Blim in recent years and that fishing mortality (F) is below Fmsy and well below Flim. It is highly likely therefore that the stock is above the point where recruitment would be impaired. Recruitment indices (estimated abundance of 1 year old shrimp) derived from Norwegian research surveys showed a significant decline from 2007 to 2010, modest increases from 2011 to 2013, but the recruitment index for 2014 was the highest observed in the time series. However the abundance of recruits of age 1 in 2015 returned to levels seen in recent years. The assessment model estimates that stock biomass will be above Btrigger in 2015, with the probability of biomass falling below Blim estimated at 0%. With catches of up to 21,500 tonnes in 2016, F is expected to remain below Fmsy, with stock biomass consequently forecast to be above Bmsy in 2016, so catches of up to 21,500 tonnes are consistent with the MSY approach. With current stock biomass estimates above Bmsy, it would normally be concluded that there is a high degree of certainty that the stock is above the point where recruitment would be impaired. However the ICES benchmark concluded that the length-based model was the preferred model for this stock, and although NIPAG concluded that the length-based model was not yet sufficiently developed for use in providing advice, initial output from the length-based model estimated stock biomass to be lower and fishing mortality higher than the values estimated by the surplus production model. In addition, ICES advice recognises that the surplus production model is not fully sensitive to year-to-year changes. On the basis that further understanding of the performance of the assessment models is required, the assessment team were precautionary in their scoring of this PI and concluded that SG100 is not met.		
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	N

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing
	Justification	A specific target reference point has not been defined explicitly for this fishery. However a key output of the assessment of stock status is an estimate of the current level of biomass in relation to Bmsy. NIPAG estimates stock biomass in 2014 and 2015 to be 1.41 x Bmsy and 1.50 x Bmsy respectively. Current fishing mortality (F) is estimated to be below Fmsy, and with a TAC of 21,500 tonnes, the assessment model predicts that F will remain below Fmsy and stock biomass will remain above Bmsy in 2016. It can be concluded that the stock is currently at or fluctuating around its target reference point. The ICES Benchmark concluded that the length-based model was the preferred model for this stock, and although NIPAG concluded that the length-based model was not yet sufficiently developed for use in providing advice, initial output from the length-based model estimated stock biomass to be lower and fishing mortality higher than the values estimated by the surplus production model. In addition, ICES identified some evidence of instability in the stock production model. Based on the need for further understanding of the performance of the assessment models, and that stock biomass has only just recently recovered from a decline from 2006 to 2012, it cannot be concluded with a high degree of certainty that the stock has been fluctuating around its target reference point in recent years and therefore the SG100 is not met.
References		Hvingel, C. 2015. The 2015 assessment of the North Sea / Skagerrak shrimp stock using a Bayesian surplus production model. NAFO SCR Doc. 15/59. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. Neilsen, A., Munch-Petersen, S., Eigaard, O., Søvik, G., and Ulmestrand, M. 2015. A stochastic length-based assessment model for the *Pandalus* stock in Skagerrak and the Norwegian Deep. NAFO SCR Doc. 15/56. Søvik, G. and Thangstad, T.H. 2014a. Results of the Norwegian Bottom Trawl Survey for Northern Shrimp (*Pandalus borealis*) in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa east) in 2014. NAFO SCR Doc. 14/54.

Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Target reference point	No specific target reference point has been defined explicitly for the fishery, although Bmsy can be considered to be an implicit TRP.	Specific values of the reference points are not provided in the assessment reports. Measures of stock biomass are given as relative (B/Bmsy) rather than as absolute values.	In 2014, B/Bmsy = 1.50
Limit reference point	Fmsy Flim (1.7 x Fmsy) Blim (0.3 x Bmsy) Btrigger (0.5xBmsy)	Specific values of the reference points are not provided in the assessment reports. Measures of stock biomass and fishing mortality are given as relative (B/Bmsy, F/Fmsy) rather than as	In 2014, B/Bmsy = 1.50, i.e. current biomass is higher than Blim and Btrigger. In 2013, F/Fmsy = 0.54, i.e. current F is lower than Fmsy and Flim.

PI 1.1.1	**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
		absolute values.	
OVERALL PERFORMANCE INDICATOR SCORE:			**80**
CONDITION NUMBER (if relevant):			

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	Reference points are derived within the Maximum Sustainable Yield (MSY) framework adopted generically within ICES and are consistent with the Precautionary Approach (PA). The current stock assessment uses a stock production model which evaluates stock status in relation to the MSY reference points Btrigger and Fmsy and the PA reference points Blim and Flim. Bmsy is used as an implicit target reference point.		
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	N
	Justification	The stock assessment evaluates the stock biomass in relation to two reference points, Btrigger and Blim, above which there is no appreciable risk of impairing recruitment. Btrigger is the biomass encountered with low probability if Fmsy is implemented. It is set at 50% of Bmsy (the 10th percentile of the Bmsy estimate) which is significantly above Blim (30% of Bmsy) below which recruitment is expected to be impaired. The NAFO/ICES working group (NIPAG) considers that 30% of Bmsy is an appropriate Blim for *Pandalus borealis* stocks assessed using a production model, although the MSC default for Blim is 50% of Bmsy. In practice, ICES management advice for this stock takes into account stock status in relation to both Blim (0.3 Bmsy) and Btrigger (0.5Bmsy). The 2015 NIPAG report concluded that the stock has remained above Btrigger throughout the history of the fishery and will remain so in 2016. Flim (defined as 170% of Fmsy) is the value of F which would drive the stock to Blim and the 2015 assessment concluded that F has been below Fmsy in recent years. The ecological role of the shrimp stock in the Skagerrak, and Norwegian Deep has not been taken into account in the setting of limit reference points. For example, predation is likely to be an important source of mortality for shrimp, but predator abundance indicators have varied little over the last ten years of surveys, and so it is not clear how the Skagerrak / North Sea shrimp stock might respond to large variations in predator abundance. In comparison with other shrimp stocks (e.g. West Greenland), predator abundance has not been considered therefore in the setting of the limit reference points. Thus SG100 is not achieved.		

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	N
	Justification	Although a target reference point is not defined explicitly, the assessment of stock status estimates stock biomass relative to Bmsy, and implicit within the harvest strategy is that biomass should be maintained at or above Bmsy. The assessment calculates the risk of biomass falling below Bmsy, Btrigger (50% of Bmsy) and Blim (30% of Bmsy). The implicit target reference point of Bmsy and the assessment of the status of the stock in relation to the target reference point are used to manage the fishery through the setting of an appropriate TAC within a MSY framework. To ensure that fishing mortality remains below Fmsy and that stock biomass would remain above Bmsy in 2016, ICES advice is that catches should not exceed 21,500 tonnes. The ecological role of the shrimp stock in the Skagerrak and Norwegian Deep has not been taken into account in the setting of a target reference point. For example, predation is likely to be an important source of mortality for shrimp, but predator abundance indicators have varied little over the last ten years of surveys, and so it is not clear how the Skagerrak / North Sea shrimp stock might respond to large variations in predator abundance. In comparison with other shrimp stocks (e.g. West Greenland) predator abundance has not been considered in the setting of the target reference point. Thus SG100 is not achieved.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not relevant	
	Justification	*Pandalus borealis* is not a key trophic level species, as it does not meet all the criteria set out in paragraph CB2.3.13 of the MSC Certification Requirements v1.3. In particular, shrimp do not form dense schools. *Pandalus borealis* are prey for cod, saithe and other predators, but within the Skagerrak / North Sea ecosystem, their biomass is low and they are not widely distributed. On an ecosystem scale, catches are low and *P. borealis* is unlikely to play an important role in energy transfer in the ecosystem as shrimp predators will consume other prey species. *Pandalus borealis* cannot be considered as an LTL species in the Skagerrak / North Sea ecosystem.		
References		General context of ICES Advice, 2015 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/2015/General_context_of_ICES_advice_2015.pdf Hvingel, C. 2015. The 2015 assessment of the North Sea / Skagerrak shrimp stock using a Bayesian surplus production model. NAFO SCR Doc. 15/59.		

PI 1.1.2	Limit and target reference points are appropriate for the stock	
	ICES, 2015d. Northern shrimp (*Pandalus borealis*) in Divisions IIIa West and IVa East (Skagerrak, Norrthern North Sea in the Norwegian Deep). ICES Advice 2015 Book 6. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14.	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

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?	N/A		N/A
	Justification	The most recent NIPAG stock assessment estimated that stock biomass is currently above Bmsy. The stock is not therefore considered to be depleted and there is no requirement to score PI 1.1.3.		
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?	N/A	N/A	N/A
	Justification	N/A		
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?	N/A	N/A	

PI 1.1.3		**Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe**
	Justification	N/A
References		
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	N

PI 1.2.1		There is a robust and precautionary harvest strategy in place
	Justification	The harvest strategy for the shrimp stock in the Skagerrak and Norwegian Deep is underpinned by annual agreements between the EU and Norway on the regulation of fisheries in the North Sea and the Skagerrak and Kattegat as defined by the Framework Agreement between the EU and Norway Council Regulation ((EEC) 2214/80 of 27 June 1980), and by the Common Fisheries Policy (CFP) of the European Union in accordance with the basic fisheries regulation (EC. 2371/2002). In Norway responsibility for fisheries management, legislation and policy lies with the Ministry of Trade, Industry and Fisheries. The fundamental principle for the Norwegian management of living marine resources is the principle of sustainable use based on the best available scientific advice. Implementation of the CFP at a national level is carried out through the individual Member States. The stock management objective for the whole Skagerrak and Norwegian Deep shrimp fishery is to maintain the fishery within agreed limits based on annual stock assessments. The harvest strategy includes restrictions on fishing effort through limited entry, annual quotas (TACs), technical measures for the shrimp fishery (mesh sizes, by-catch rules) as set out in EU Regulation 850/1998, a minimum landing size of 7 cm total length in Norway, a prohibition on high-grading, which is the practice of discarding small to medium size low value shrimp and replacing with larger, higher value shrimp, and the mandatory use of by-catch reduction devices. A selective grid became mandatory in all shrimp fisheries in the Skagerrak in 2013, although currently grids are not mandatory within the 4 nautical mile zone in Norwegian waters, and grids became mandatory in the North Sea area of the fishery in 2015. Most vessels fishing in the North Sea have voluntarily used grids before they became mandatory, and most Norwegian vessels use grids all the time as they fish both within and outside the 4 nm baseline. There are ongoing discussions regarding the introduction of grids within the 4nm baseline of Norwegian waters, but no regulation has yet been introduced. There are strict monitoring requirements for shrimp vessels in all the national fleets through log books and electronic recording, all larger vessels must carry VMS, and vessels must also report when they intend to enter or leave the coastal states' waters and may have to await inspection before commencing fishing or leaving a coastal state's waters. All elements of the harvest strategy work together to ensure that the exploitation rate is consistent with maintaining stock biomass at levels reflected in the target and limit reference points and that juvenile shrimps and by-catch species are afforded protection. The assessment of the status of the stock in relation to reference points ensures that the harvest strategy can be responsive to the state of the stock. TACs, levels of fishing effort and technical conservation measures can all implicitly be modified in response to changes in the state of the stock. However there is no formal management plan agreed between Norway, Sweden and Denmark within which a harvest strategy has been designed to meet the management objectives, and there is no clear statement of how the strategy is modified in response to stock changes. Norway is currently leading the development of a shrimp management plan in the Skagerrak and Norwegian Deep working alongside their EU counterparts in Denmark and Sweden and in conjunction with Norwegian scientists at IMR in Bergen. The management plan is not expected to be implemented until 2015/2016, and until then it cannot be concluded that the harvest strategy is designed to achieve stock management objectives and the SG100 is not met therefore.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
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	N

PI 1.2.1		There is a robust and precautionary harvest strategy in place
	Justification	The Guidelines to the MSC Certification Requirements v1.3 (GCB2.5.2) state that "… the harvest strategy shall be appropriate to achieving the management objectives expressed in the target and limit reference points" and (GCB2.5.4) that "this PI scores the overall performance of the harvest strategy, particularly the way that the different elements work together to keep the stock at levels consistent with reference points." The most recent stock assessment has concluded that despite recent declines, stock biomass has been above Btrigger throughout the history of the fishery and is likely to remain so under the current harvest strategy, and indeed is currently above Bmsy. It can be concluded therefore that the harvest strategy is achieving its objectives. In recent years TACs have often been set at levels higher than those recommended by ICES, but in practice in most years the TAC has not been taken up fully, and landings have been below the TAC advised by ICES. In 2014, landings did not exceed the TAC, but total catches including estimated discards did exceed the TAC. The agreed TAC for 2016 includes discards, and so total catches are not expected to exceed the TAC. There is a rigorous monitoring programme in place including monitoring of fishing activity through the VMS system, accurate detailed recording of landings and completion of log books and electronic reporting of catches by vessels, and all these elements appear to be working effectively. Cross checks of fishing activity recorded on the VMS system and electronic recording of catches and landings data in the various fleets did not identify any discrepancies. Vessel inspections confirm that there is compliance with management regulations. There was no evidence of high-grading occurring in the Danish fishery, although there is some evidence that high-grading does occur within the Swedish fishing fleet, and that the prohibition is not effectively enforced in Sweden, for which a condition was raised against PI 3.2.3 in the Swedish fishery assessment. In Norway quota restrictions are likely to provide an incentive for high-grading, and it is likely therefore that high-grading does occur. Although there is evidence that the harvest strategy is achieving its overall objectives, some stakeholders expressed concern about the level of discarding of small shrimps either because the shrimp are smaller than the commercial size of 15 mm CL (6cm total length) or through high-grading. There is particular concern about discarding of small shrimp in the Swedish fishery, and to a lesser extent in the Norwegian fishery, exemplified by the higher proportions of the total catch that are landed in Sweden and Norway as high value large shrimp boiled on board in comparison with similar data for the Danish fleet. Discard rates in the Danish fleet based on observer data were estimated at between 2 and 8% of the total catch in 2008-2013, but increased to 18% in 2014. In the Swedish fishery discard rates are between 12 and 31%. However the Swedish TAC is only 14% of the overall TAC, and the overall estimated discard rate by weight for the three fleets combined was 12% in 2012 and 10% in 2013 and 19% in 2014, although there is some uncertainty surrounding these estimates particularly for the Norwegian fleet. Whilst this level of discarding is not hindering the harvest strategy from achieving its overall objective, and the discard rate is taken into account by ICES when providing TAC advice, the harvest strategy could be improved by reducing the discard rate of small shrimps. In 2015 Norway has introduced new legislation including real-time closures (RTCs) when encountering areas of high densities of small shrimp (two closures have already occurred demonstrating the effectiveness of the measure), and increasing the minimum landing size to 7cm total length.. A multi-agency project, the NORDEN project, is currently researching methods of reducing the catch of small shrimps. Initial results are very encouraging; experimental fishing using a mesh size of 47mm instead of the standard 35 mm mesh shows a significant reduction in the capture of small shrimp, particularly in the "lus" (very small) category. The assessment team **recommends** the client to liaise with research scientists and gear technologists in the framework of the NORDEN project. This would better ensure that the project is carried out on a practical basis in a way that fishers could easily implement any desirable technical gear modifications to significantly reduce the capture of small shrimp. The clients could also offer assistance with gear trials on their vessels. Despite some concerns raised by stakeholders about the discarding of small shrimps noted above, the assessment team considers that the harvest strategy is achieving the overall management objectives of ensuring that the stock is maintained at levels consistent with reference points, and that the SG80 is met therefore. The harvest strategy has not been fully tested through, for example, a management strategy evaluation (MSE), and so SG100 is not met.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	There is an effective monitoring system in place for all fleets including Norwegian vessels exploiting the *Pandalus* stock, incorporating VMS on the larger vessels, log books, detailed recording of landings and inspection of vessels. There is also an annual stock survey carried out by Norway which provides estimates of stock biomass, recruitment and spawning biomass. All these elements of the monitoring system contribute to an assessment of the effectiveness of the harvest strategy, and provide evidence that the harvest strategy is maintaining stocks above MSY Btrigger.		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	Elements of the harvest strategy may be reviewed and modified on a regular basis, but there is no formal integrated fisheries management plan with agreed periodic reviews.		
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		Council Regulation (EC) No. 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. MSC Certification Requirements v1.3 MSC Guidance on Certification Requirements v1.3 Ulmestrand, M., Munch-Petersen, S., Søvik, G. and Eigaard, O. 2014. The		

PI 1.2.1	There is a robust and precautionary harvest strategy in place	
	Northern shrimp (*Pandalus borealis*) Stock in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa East). NAFO SCR Doc. 14/65.	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
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	N	
	Justification	Although there are no formally defined harvest control rules, the fishery is managed through a series of regulations including TACs, effort limitation and technical conservation measures, and it is generally understood that these regulations can be changed in order to reduce the exploitation rate if limit reference points are approached. In particular, TACs are reviewed annually and have been reduced significantly in recent years in response to declines in stock biomass. Whilst it is generally understood that fishery regulations can be changed in order to reduce the exploitation rate if limit reference points are approached, there are no explicit harvest control rules in place which define what management action will be invoked if the stock biomass declines to levels close to Btrigger or Blim, or if fishing mortality increases to levels close to Flim. In recent years TACs have been changed in line with declining stock biomass, but it cannot be concluded that TACs have always been set fully in line with ICES advice. In 2015, the EU/Norway consultations agreed a TAC in line with ICES advice including a provision for taking discards into account. In 2014, ICES advice was that catches of up to 14,800 tonnes in 2015 would ensure that F remained below Fmsy and stock biomass remained above Bmsy, but due to uncertainties within the assessment model and alternative model estimates of stock biomass and fishing mortality, ICES advised that total catches should be no more than 10,900 tonnes. Assuming that discard rates do not change from the average of the last three years, this implies landings of no more than 9,777 tonnes. At the meeting in December 2014 between the EU and Norway on the regulation of fisheries in the North Sea and the Skagerrak, the Norwegian and EU delegations accepted the ICES advice and set a TAC of 10,900 tonnes. The TAC represents landings and not total catch, so the TAC was set at a slightly higher level than the ICES advice. In 2013, ICES advice was that there were some uncertainties in the assessment process and that catches in 2014 should not therefore exceed 6000 tonnes. The Norwegian and EU delegations took note of the ICES advice, but agreed to a rollover of the 2013 TAC of 9500 tonnes. Whilst a TAC of 9500 tonnes would still have been consistent with managing the stock within an MSY Framework, the TAC decision in 2014 exemplifies the lack of a well-defined harvest control rule which links ICES advice based on the most recent stock assessment with changes in TAC. Whilst it is generally understood that the TAC is modified in relation to changes in stock biomass and therefore the fishery meets the SG60, if future TACs were set at levels significantly contrary to ICES advice, then the assessment team considers that the SG60 would no longer be met. As the SG80 is not met, a condition is raised.		

PI 1.2.2		There are well defined and effective harvest control rules in place		
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?		N	N
	Justification	The key implicit harvest control rule that has been selected is the revision of the TAC in response to changes in stock status. ICES advice in 2013 and 2014 considered the major uncertainties underlying the assessment model's estimate of stock status and consequently advised TACs lower than the level that is fully consistent with the MSY approach. In addition, ICES advises a TAC for both total catch and landings that takes the discard rate into account. The annual EU and Norway negotiations on the regulation of fisheries in the North Sea and the Skagerrak consider the annual ICES advice but have not always set TACs in line with the ICES advice and therefore the selection of the HCR could not therefore be considered to have taken into account the main uncertainties in the assessment or any uncertainties in the estimation of discard rates. The SG80 is not met therefore.		
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.
	Met?	Y	Y	N
	Justification	Annual assessments of the status of the stock provide evidence that the management tools in place are appropriate to this fishery and over a long time scale appear to have been effective in controlling the level of exploitation. In some years the TAC has been set above that advised by ICES, and until the ICES advice is formally taken into account within an explicit harvest control rule, the SG100 will not be met.		
References		Hvingel, C. 2015. The 2015 assessment of the North Sea / Skagerrak shrimp stock using a Bayesian surplus production model. NAFO SCR Doc. 15/59. ICES, 2015d. Northern shrimp (*Pandalus borealis*) in Divisions IIIa West and IVa East (Skagerrak, Norrthern North Sea in the Norwegian Deep). ICES Advice 2015 Book 6. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. Agreed Record of Conclusion of Fisheries Consultations between the European Union and Norway on the Regulation of Fisheries in Skagerrak and Kattegat in 2014. London, March 2014. 8pp Agreed Record of Conclusion of Fisheries Consultations between the European Union and Norway on the Regulation of Fisheries in Skagerrak and Kattegat in 2015. Clonakilty, December 2014. 8pp.		
OVERALL PERFORMANCE INDICATOR SCORE:				**65**

PI 1.2.2	There are well defined and effective harvest control rules in place	
CONDITION NUMBER (if relevant):		**1**

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

PI 1.2.3		Relevant information is collected to support the harvest strategy
	Justification	A recent study by Knutsen *et a*l. (2014) using microsatellite DNA analyses showed that spatial genetic structure among oceanic samples from the Skagerrak and eastern North Sea was weak and non-significant. However there was some clear genetic differentiation between samples from the Skagerrak fjords and the oceanic samples. Knutsen *et al*. (2014) concluded that the lack of genetic differentiation between oceanic samples coupled with information on 30 years of survey and commercial catch data is consistent with the current management assumption that the shrimp fishery in the Norwegian Deep and Skagerrak is a single stock. There is a comprehensive range of both fishery-dependent and fishery-independent data and environmental information available for this fishery. Catch and effort data are available from log books for the Norwegian, Danish and Swedish fleets and LPUE data are analysed and standardised for use in the assessment. Annual stock surveys of northern shrimp have been undertaken by Norway since 1984, but because of changes in the survey programme, data from 2006 onwards are considered most comparable with data from current surveys. The surveys provide biomass indices (with standard error), size, age and sex distribution, and a recruitment index based on the number of 1-year old shrimp (which produces a good correlation with abundance of 2 and 3 year old shrimp in the following two years), and a spawning stock biomass index based on the number of berried females. In addition the stock survey provides an index of shrimp predator biomass, bottom temperature and hydrographical (CTD) data. Harvest rates can be estimated from landings data and stock biomass indices from the Norwegian survey. On-board sampling by observer programmes in Denmark provides estimates of discard rate (proportion of total catch) in the Skagerrak and Norwegian Deep. Similar data are available from Swedish vessels in the Skagerrak and have been implemented in the Norwegian Deep in 2015. No such similar data are available for Norwegian vessels because there is no on-board observer programme although samples of unsorted catch are collected in both the Norwegian Deep and Skagerrak by local inshore Norwegian fishermen and the Norwegian Coastguard. For the stock assessment Norwegian discards in the Skagerrak are estimated by applying the Danish discards to landings ratio to Norwegian landings, based on the assumption that the total catch composition is similar for Norwegian vessels as Danish vessels. Søvik and Thangstad (2014b) compared length distributions of Danish and Norwegian catches from Skagerrak for 2009-2012 and showed that the size structure of the shrimp stock was more or less similar, supporting the use of the Danish data to estimate Norwegian discards for the Skagerrak. In the Norwegian Deep where no observer data are available, discarded shrimp are assumed to be primarily shrimp under 15 mm CL and are estimated from length distributions of the catch. Stock structure in the form of size and sex distribution is understood from sampling of length frequency of the total catches, and these data are used as input data for the new length-based analytical assessment model which is currently still in development and not yet used to provide advice. Across the three national fleets limited entry licensing with various categories and rigorous catch reporting procedures and the use of VMS means that fleet composition and behaviour are well known.

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

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	Justification	Good information about abundance and fishery removals is available for the Skagerrak and Norwegian Deep stock and is used in the assessment model to evaluate the status of the stock in relation to reference points, and to evaluate the risk of various catch options. The assessment model incorporates a time series of catches from 1970 to 2014 and four independent series of shrimp biomasses (two standardised annual commercial catch rates from Danish and Norwegian vessels, and two time series of Norwegian stock survey indices), so stock abundance is regularly monitored at a level of accuracy and coverage consistent with the harvest control rule. Fishery removals are monitored for all vessels in the fishery through log books, mandatory catch declarations and observer sampling programmes and fishing activity is closely monitored by VMS and regular monitoring by the Coastguard in Denmark, Sweden and Norway. Cross checks of these data sets confirm the accuracy of the data. Log book records on catch and effort are not completed by all Norwegian vessels, but all vessels must make landings declarations, so data on landings from the Norwegian fleet are complete. Observer sampling of total catch composition is less comprehensive, although both Danish and Swedish scientists carry out discard monitoring under the European Commission's Data Collection Framework (DCF). The data show some annual variation in the proportion of the total shrimp catch that is discarded, but ICES uses average discard rates over the last three years when providing advice on the TAC. Denmark monitors discards in both the Skagerrak and Norwegian Deep, but until recently, SLU in Sweden had carried out observer sampling only in the Skagerrak area of the fishery because only 10% of fishing effort from the Swedish fleet has traditionally been undertaken in the Norwegian Deep. However, this area is becoming increasingly important for the Swedish fleet, and in 2015, observer sampling has been implemented in the Norwegian Deep (Katja Ringdahl, SLU, pers. comm.). No such similar data are available for Norwegian vessels because there is no on-board observer programme although samples of unsorted catch are collected in both the Norwegian Deep and Skagerrak by local inshore Norwegian fishermen and the Norwegian Coastguard. For the stock assessment Norwegian discards in the Skagerrak are estimated by applying the Danish discards to landings ratio to Norwegian landings, based on the assumption that the total catch composition is similar for Norwegian vessels as Danish vessels. Søvik and Thangstad (2014b) compared length distributions of Danish and Norwegian catches from Skagerrak for 2009-2012 and showed that the size structure of the shrimp stock was more or less similar, supporting the use of the Danish data to estimate Norwegian discards for the Skagerrak. In the Norwegian Deep where no observer data are available, discarded shrimp are assumed to be primarily shrimp under 15 mm CL and are estimated from length distributions of the catch. Whilst information on discards could be improved, the assessment team considers therefore that, for the stock as a whole, observer trips in conjunction with log book returns and landings declarations ensure that fishery removals are monitored at a level of accuracy and coverage consistent with the harvest control rule, and that therefore SG80b is met. There is however a lack of understanding of the inherent uncertainties in some of the data such as discard rates and estimates of fishing mortality, and the significant differences in estimates from the surplus production model and the new length-based model demonstrate that the assessment and management are not fully robust to these uncertainties. The SG100 is not met therefore.		
c	**Guidepost**		There is good information on all other fishery removals from the stock.	
	Met?		Y	

PI 1.2.3		Relevant information is collected to support the harvest strategy	
	Justification	In Norway, the Directorate of Fisheries confirms that there are no catches of *Pandalus borealis* recorded in their fisheries statistics in other fisheries (primarily due to the large mesh size used in other fisheries). In Denmark, most fisheries use a mesh size which is too large to catch shrimps. There may be small amounts of shrimp caught in industrial fisheries which use a small mesh size, but of 1588 samples taken from industrial catches, only 76 contained shrimps, and on average shrimps constituted less than 1% of the total catch (Jacob Handrup, Danish AgriFish Agency, pers. comm.). However all shrimp caught in other Danish fisheries will be taken off the quota, so any such catches will be taken into account in the overall assessment of stock status. Swedish vessels trawling for fish land approximately 400 kg of shrimps annually, which is a very small volume relative to shrimps landed in the directed shrimp fishery (1413 tonnes in 2013).	
References		Søvik, G. and Thangstad, T.H. 2014a. Results of the Norwegian Bottom Trawl Survey for Northern Shrimp (*Pandalus borealis*) in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa east) in 2014. NAFO SCR Doc. 14/54. Søvik, G. and Thangstad, T.H. 2014b. The Norwegian Fishery for Northern Shrimp (*Pandalus borealis*) in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa east), 1970-2014. NAFO SCR Doc. 14/63. Ulmestrand, M., Munch-Petersen, S., Søvik, G. and Eigaard, O. 2014. The Northern shrimp (*Pandalus borealis*) Stock in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa East). NAFO SCR Doc. 14/65. Hvingel, C. 2015. The 2015 assessment of the North Sea / Skagerrak shrimp stock using a Bayesian surplus production model. NAFO SCR Doc. 15/59. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. Knutsen, H., Jorde, P. E., Blanco Gonzalez, E., Eigaard, O. R., Pereyra, Ricardo T., Sannæs, H., Dahl, M., Andre´, C., and Søvik, G. Does population genetic structure support present management regulations of the northern shrimp (Pandalus borealis) in Skagerrak and the North Sea? – ICES Journal of Marine Science, doi: 10.1093/icesjms/fsu204.	
OVERALL PERFORMANCE INDICATOR SCORE:			**90**
CONDITION NUMBER (if relevant):			

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	N
	Justification	The NAFO/ICES Pandalus Assessment Group (NIPAG) report provides the output from two assessment models, a stochastic length-based assessment model and a Bayesian surplus production model. The models were evaluated at the final session of the ICES benchmark assessment of this stock in 2013 and both models were considered capable of delivering full analytical assessments of the shrimp stock. The length-based assessment model was preferred to the surplus production model by the benchmark group because it uses more detailed biological information on size distribution of the stock and therefore responds more quickly to change in stock status, but the model was not fully operational at the 2013 NIPAG meeting, and so the benchmark recommended use of the surplus production model. The length-based model was still not fully operational at the 2014 NIPAG meeting, and although significant development of the model had been carried out by the 2015 meeting, there are still some concerns about the performance of the length-based model, so ICES advice continues to be based on the output from the surplus production model. The surplus production model is appropriate for the stock because shrimps cannot be aged and the model has been used consistently in other shrimp stocks, and the model's ability to estimate current stock biomass and fishing mortality in relation to MSY-based reference points ensures that the model is appropriate to the harvest control rule. The surplus production model synthesises information from input priors such as initial biomass ratio, carrying capacity and survey catchability, and a time series of catches from 1970 to 2014, and four independent series of shrimp biomasses (two standardised annual commercial catch rates from Danish and Norwegian vessels, and two time series of Norwegian stock survey indices). The model takes into account some of the features of the biology of *Pandalus borealis*, but there is no information on predator abundance included in the model (as is the case for the Greenland shrimp assessment, where the inclusion of a predation component provided a better fit of the model to the data) because there is no clear link between historical survey estimates of predator biomass and shrimp biomass, so the assessment does not meet the SG 100.		
b	**Guidepost**	The assessment estimates stock status relative to reference points.		
	Met?	Y		

PI 1.2.4		There is an adequate assessment of the stock status		
	Justification	The assessment estimates the status of the shrimp stock and calculates the stock biomass and level of fishing mortality in relation to the MSY reference points Fmsy and MSY Btrigger, and the ICES Precautionary Approach reference points Blim and Flim. The assessment model also estimates for a range of catch options the probability of the stock biomass falling below the various reference points and the fishing mortality exceeding the fishing mortality 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 surplus production model takes uncertainty into account in a probabilistic way. The assessment model is a Bayesian model which provides posterior distributions of parameter estimates, and which provides projections of estimated risk of falling below biomass reference points and of exceeding fishing mortality reference points.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	The surplus production assessment model produced good predictions of the four independent biomass indices used as input to the 2015 assessment, and whilst the model provides a good description of trends in stock development, the lack of size structure information in the model results in the model being insensitive to large and rapid changes in recruitment. The development of a fully analytical assessment in 2013 is considered to be a significant improvement on previous assessment approaches which used the ICES approach to data-limited stocks and were based on the Norwegian survey biomass index. An alternative newly-implemented stochastic length-based assessment model has also been applied to this fishery, but the model still requires some further development. The length-based model and the surplus production model provide similar estimates of stock biomass but, in some years, significantly different estimates of fishing mortality. The assessment team **recommends** therefore that further research is undertaken to resolve the differences in fishing mortality generated by the two assessment approaches. Predation is not explicitly incorporated into the stock assessment model, but in other *P. borealis* fisheries e.g. West Greenland, the model explicitly includes cod predation and the addition of this component provided a better fit than alternative models.		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y

PI 1.2.4		There is an adequate assessment of the stock status
	Justification	The stock assessment is undertaken by Norwegian scientists and presented at the NAFO/ICES *Pandalus* Assessment Group (NIPAG) along with assessments of other *Pandalus* stocks. There is therefore an inherent peer review by the various members of NIPAG, including scientists from Norway, Russian Federation, Canada, Denmark, Estonia, Greenland, Sweden, Spain, France and Faroe Islands, and the NAFO Secretariat. The draft report is then peer reviewed by the ICES Review Group, whose members are stock assessment scientists not involved with the *Pandalus borealis* assessments and, from time to time, scientists who are outside the ICES assessment process. In addition in 2012/13 the assessment has been subject to an ICES benchmark assessment. Finally, the assessment model (Hvingel and Kingsley, 2006) has been published in a peer-reviewed journal. The assessment methodology is therefore subject to regular internal and external peer review.
References		Nielsen *et al*. 2015. A stochastic length-based assessment model for the *Pandalus* stock in Skagerrak and the Norwegian Deep. NAFO SCR Doc. 15/56. Hvingel, C. 2015. The 2015 assessment of the North Sea / Skagerrak shrimp stock using a Bayesian surplus production model. NAFO SCR Doc. 15/59. Hvingel, C. and Kingsley, M.C.S. 2006. A framework to model shrimp (*Pandalus borealis*) stock dynamics and to quantify the risk associated with alternative management options, using Bayesian methods. ICES Journal of Marine Science, 63: 68-82. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. ICES 2013. Report of the Inter-Benchmark Protocol on Pandalus in Skagerrak and the Norwegian Deep (IBPPand), 12-19 September 2013, Dartmouth, NS, Canada. ICES CM 2013/ACOM:71. 10pp.
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.1.1

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 (saithe) Y (cod)	Y (saithe) Y (cod)	N
	Justification	Landings data for *Pandalus borealis* and other retained species from Pandalus trawls in both the Skagerrak and Norwegian Deep from 2012-2014 were provided by the Norwegian Directorate of Fisheries and are presented in Table 7 of the report. There are no data on total catch compositions for the Norwegian vessels, so the standard MSC method of identifying "main" retained species cannot be used. However based on the species composition of the landings from Pandalus trawls in the Norwegian fishery in the Skagerrak and Norwegian Deep (Table 7), and the analysis of total catch composition from the Danish and Swedish fisheries in the same area (including trawls without a grid), the assessment team concluded that saithe and cod could be considered as main retained species in the Norwegian shrimp fishery. **Cod**. ICES 2015 advice for cod in the North Sea and Skagerrak shows that the status of the stock has gradually improved over the last few years in the Skagerrak and is now above Blim, but target reference points are not reached yet. Cod can therefore be considered to be highly likely to be within biologically-based limits. **Saithe**. ICES 2015 advice for saithe in the North Sea and Skagerrak reports that F has fluctuated around Fmsy in recent years and at the beginning of 2015 SSB was well above Blim and has been fluctuating around MSY Btrigger since 2011. Saithe therefore meets the SG80 for this PI. In addition to the two main retained species, the assessment team noted that coastal cod are caught in shrimp trawls particularly within the 4nm zone where the use of a sorting grid is not mandatory. Genetics studies have shown that there are several populations of coastal cod from the Swedish border to Stad that are distinguishable from the North Sea and Skagerrak cod stock. Catches of coastal cod and North Sea cod are not recorded separately, so there is no information about the quantity of coastal cod caught in this fishery. However there are concerns about the current status of coastal cod stocks south of 62 degrees North because of low abundance indices in recent years, and so the SG100 is not met. In addition there are many minor retained species caught in the trawl with grid, the trawl with grid and fish tunnel and the trawl without a grid, and for some species there is very little information, and so SG100 is not met for these 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		
b	**Guidepost**			Target reference points are defined for retained species.
	Met?			N
	Justification	Target reference points are defined for both saithe and cod, but not for some of the other minor retained species, so the SG100 is not met.		
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?	N/A	N/A	
	Justification			
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		

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**
	Justification	The status of cod and saithe are well known. There are some retained species for which there is less available information on stock status, but there is a package of management measures in place, which includes mandatory use of the grid (except within 4nm of the Norwegian coastline), gear restrictions and effort restrictions, which controls the level of catches of retained species. The use of the sorting grid is not mandatory within 4nm of the coastline, but many Norwegian vessels use a grid when fishing both inside and outside the 4 nm limit, and the assessment team concluded that the measures in place ensure that the total catch of these other retained species across the whole fishery is relatively small and unlikely to hinder the recovery of the stock.
References		EU Cod Recovery Programme - Council Regulation (EC) 1342/2008 Annex 6.3.3 https://issuu.com/havforskningsinstituttet/docs/rapport_2015/203 ICES, 2015a. Cod in Sub-Area IVb (North Sea), and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak). ICES Advice 2015 Book 6.3.4. ICES, 2015b. Saithe in Sub-Area IV (North Sea), Divisions IIIa West (Skagerrak) and Sub-Area VI (West of Scotland and Rockall). ICES Advice 2015 Book 6.3.35. Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050.
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.1.2

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	N
	Justification	There is a comprehensive EU recovery plan for cod under CR 1342/2008 which is considered as a management strategy for cod. The long term management plans for cod and saithe can be considered to be strategies in place for managing the main retained species. The assessment team considers that the mandatory use of the grid (except within 4nm of the Norwegian coastline) significantly reduces the catch of all retained species, and these gear restrictions, coupled with the recovery plan for cod stocks (CR 1342/2008), the quota system, and effort restrictions can all be considered as elements of a strategy for managing retained species. However the use of the sorting grid is not mandatory within 4nm of the coastline, and even though many Norwegian vessels use a grid when fishing both inside and outside the 4 nm limit, the assessment team concluded that the SG100 is not met. In addition there are concerns about the status of coastal cod in southern Norway south of 62 degrees North and following recommendations by IMR in 2008, the Directorate of Fisheries supports the implementation of a recovery plan for coastal cod including increased minimum size and conservation areas. To date, no recovery plan for coastal cod has been implemented and the assessment concluded therefore that there is not a strategy in place for managing all retained species and the SG100 is not met. The assessment team **recommends** that the use of a sorting grid should be mandatory within the 4 nm limit. Whilst the assessment team considered that the shrimp fishery does not pose a risk of serious or irreversible harm to the retained species (PI 2.1.1) any potential impact of the shrimp fishery on retained species would be minimised if the sorting grid was mandatory across the whole fishery.		
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.

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		
	Met?	Y	Y	N
	Justification	ICES Advice 2015 for cod in the North Sea and Skagerrak suggests that the cod recovery plan for the North Sea is working in improving stocks because there has been a gradual improvement in the status of the stock since 2007. Saithe stocks are currently fluctuating around MSY Btrigger. Experimental testing and observer data also confirms that the use of the grid contributes to the avoidance of catches of cod, saithe and other retained species. However as the assessment team concluded that there was not a strategy in place to manage all retained species, the SG100 is not met.		
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	The cod recovery plan has been in place since 2008 under CR 1342/2008. It is considered that it has been successfully implemented, and it is sufficient for helping the recovery of cod in the North Sea, Skagerrak and Kattegat. In addition the use of total and individual catch quotas appear to be working successfully. The mandatory use of the selective grids for all vessels has been implemented now in both the Skagerrak and Norwegian Deep, but there is an exemption for vessels fishing inside the 4nm baseline in Norwegian waters, so it cannot be concluded that a strategy has been implemented in all areas and so the SG100 is not met.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	ICES Advice for 2015 shows that the cod recovery plan for the North Sea and Skagerrak is working in improving stocks because there has been a gradual improvement in the status of the stock since 2007, and the cod stock is now within biological limits. Saithe stocks are stable and there has been a general reduction in bycatches of all species through measures such as the mandatory use of the grid (except within 4nm of the Norwegian coastline). However as the assessment team concluded that there was not a strategy in place to manage all retained species, the SG100 is not met.		
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

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**
	Justification	Not relevant
References		EU Cod Recovery Programme - Council Regulation (EC) 1342/2008 Annex 6.3.3 https://issuu.com/havforskningsinstituttet/docs/rapport_2015/203 ICES, 2015a. Cod in Sub-Area IVb (North Sea), and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak). ICES Advice 2015 Book 6.3.4. ICES, 2015b. Saithe in Sub-Area IV (North Sea), Divisions IIIa West (Skagerrak) and Sub-Area VI (West of Scotland and Rockall). ICES Advice 2015 Book 6.3.35.
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.1.3

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	Information is available from logbooks, landings data for the Norwegian fishery and the Directorate of Fisheries which provides qualitative and quantitative information on an annual basis of the amount of main retained species taken by the fishery. Despite the prohibition on discarding, the Norwegian Directorate of Fisheries, the Norwegian Coastguard and stakeholders acknowledge that some discarding of retained species may occur, and the lack of information on discard levels means that accurate and verifiable information is not available on the total catch of all retained species. The SG100 is not met therefore.		
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	Information is available to estimate outcome for both main retained species (cod and saithe) but the assessment team considered that the information, particularly the lack of information on the level of discards of cod and saithe, is not sufficient to quantitatively estimate outcome status with a high degree of certainty for all retained species. SG100 is not met therefore.		
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
	Justification	The team considers that information provided within ICES advice is adequate to support the long term management plans for cod and saithe, and to evaluate if they are achieving their overall objective. Whilst there is a strategy in place to manage the other minor retained species, there is not sufficient information to evaluate with a high degree of certainty whether the strategy is achieving its objective. SG100 is not met therefore.		

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**		
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	N
	Justification	Landings of retained species are collected on an annual basis in log books and landings declarations (sale slips), and along with estimates of discard levels of those retained species under the EU Data Collection Framework in the Danish and Swedish vessels which fish in the same area, there is sufficient data to assess whether there has been any increase in risk level posed by the shrimp fishery for the main retained species. Information on removals of retained species could be improved and this issue is covered under a condition raised against PI2.2.3. Monitoring is not conducted in sufficient detail (lack of information on the levels of discarding of retained species) to assess ongoing mortalities to all retained species.		
References		EU Cod Recovery Programme - Council Regulation (EC) 1342/2008 Annex 6.3.3 ICES, 2015a. Cod in Sub-Area IVb (North Sea), and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak). ICES Advice 2015 Book 6.3.4. ICES, 2015b. Saithe in Sub-Area IV (North Sea), Divisions IIIa West (Skagerrak) and Sub-Area VI (West of Scotland and Rockall). ICES Advice 2015 Book 6.3.35.		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the by-catch species or species groups and does not hinder recovery of depleted by-catch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main by-catch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main by-catch 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 by-catch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	Without a formal observer programme in the Norwegian fishery, there is no information on species which might be caught and discarded despite the prohibition on discarding. There are no data therefore on total catch compositions, so the standard MSC method of identifying "main" bycatch species cannot be used. Such information is available for the Danish and Swedish fisheries which use the same gear in the same areas. In the Danish fishery in both the Skagerrak and Norwegian Deep, there were no bycatch species which constituted more than 5% of the catch. Similarly in the Swedish fishery total catch composition is available for the Skagerrak for both trawl with grid and trawl with grid and tunnel, and for both types of gear, no main bycatch species were identified. During the site visit some stakeholders suggested that there might be significant discarding of blue whiting and Norway pout in the Norwegian fishery. Although analysis of total size compositions from the Danish and Swedish observer programmes over the last few years in both the Skagerrak and Norwegian Deep showed that neither species contributed more than 3.5% of the total catch in any year for both trawl with grid and trawl with grid and tunnel, Norwegian vessels are permitted to fish inside the 4nm baseline using a standard Pandalus trawl without a grid. There are some historical data for the Swedish fleet for the standard trawl without grid (prohibited since February 2013) which show that in some years Norway pout, herring and greater argentine have constituted more than 5% of the total catch, but these data are not from the same area in which Norwegian vessels are permitted to fish without using a grid. Many Norwegian vessels use a grid when fishing both inside and outside the 4nm limit of the Norwegian coastline, so even if some bycatch species constitute more than 5% of the total catch for some fishing trips, these fishing trips will account for only a small proportion of the total fishing trips. Based on information for the Danish and Swedish observer programmes in the same area as the Norwegian fishery, the relatively small proportion of fishing trips which use a standard trawl without a grid, and that the prohibition of discarding in Norway is likely to at least reduce the overall level of discarding in the fishery, for the Norwegian Pandalus fishery as a whole it can be concluded that there are no main bycatch species. There is a wide range of other by-catch species for which there is not sufficient information to assess whether they are within biologically-based limits, so SG100 is not met.		

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the by-catch species or species groups and does not hinder recovery of depleted by-catch species or species groups**		
b	**Guidepost**	If main by-catch 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 by-catch 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?	N/A	N/A	
	Justification	N/A		
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 by-catch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of many by-catch species is not well known. There is a strategy in place to manage the shrimp fishery which includes catch quotas, mandatory use of the grid (except within 4nm of the Norwegian coastline) and effort restrictions all of which control the level of catches of retained species. The use of the sorting grid is not mandatory within 4nm of the coastline, but many Norwegian vessels use a grid when fishing both inside and outside the 4 nm limit, and the assessment team concluded that the strategy in place can be expected to ensure that the fishery as a whole does not cause the by-catch species to be outside biologically-based limits or hinder their recovery.		
References		NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. Isaksen, B. & A.V. Solvdal, 1997. Selection and survival in the Norwegian shrimp trawl fisheries. Proceedings of the 7& Russian/Norwegian Symposium: Gear Selection and Sampling Gears. Murmansk, 23-24 June 1997.		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**

PI 2.2.1	The fishery does not pose a risk of serious or irreversible harm to the by-catch species or species groups and does not hinder recovery of depleted by-catch species or species groups
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 2.2.2

PI 2.2.2		There is a strategy in place for managing by-catch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to by-catch 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 by-catch 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 by-catch 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 by-catch.
	Met?	Y	Y	Y
	Justification	There were no main by-catch species identified for both the Skagerrak and Norwegian Deep areas of the fishery. Total by-catch of the fishery may still be considerable even in the trawl without the tunnel, but there are measures in place for managing and minimizing by-catch – the grid significantly reduces by-catch of fish species (in comparison with the standard trawl), exploitation rate is controlled through an annual TAC (which does not appear to have been exceeded in recent years) and through individual vessel quotas, and there is a prohibition on discarding. In addition there is a multi-agency funded project (NORDEN) underway currently to determine the best way to reduce the discarding of the target species, and this should indirectly reduce the catch of by-catch species. Additional management changes in the Norwegian shrimp fishery introduced in 2105 include maximum bycatch levels and the extension of real-time closures of areas to include shrimps. All these measures can be considered to constitute a strategy for managing and minimising the level of bycatch and so SG100 is met.		
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

PI 2.2.2		There is a strategy in place for managing by-catch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to by-catch populations		
	Justification	There is confidence that the various measures that constitute the strategy to manage and minimise by-catch will work together to ensure that by-catch levels are controlled. The level of fishing effort within the shrimp fishery is effectively controlled through a TAC and individual vessel quotas, and along with maximum bycatch levels and real time closures, these measures will help to reduce the level of bycatch. Experimental studies and empirical data from the Swedish observer programme in the Skagerrak shrimp fishery demonstrate the effectiveness of the grid in minimising by-catch.		
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	The use of the selective grid is mandatory on Norwegian vessels in both the Skagerrak and Norwegian Deep, except within the 4nm baseline, and there is evidence that most Norwegian vessels are also now using the grid within the 4nm baseline. The NIPAG assessment shows that fishing effort has remained at a constant level over the last 15 years and in recent years the landings have not exceeded the catch levels advised by ICES, providing clear evidence that the level of bycatch in the shrimp fishery will also be controlled. There is clear evidence therefore that the strategy has been implemented successfully in most areas. However as the use of the selective grid is not currently mandatory within the 4nm baseline, the SG100 is not met.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Whilst exploitation rates within the shrimp fishery have clearly been controlled in recent years, and there is empirical evidence that the grid minimises bycatches, the grid is not mandatory in all areas, and some elements of the strategy were only introduced in 2015, so it is too early to conclude that the strategy is achieving its overall objective.		
References		Isaksen, B. & A.V. Solvdal, 1997. Selection and survival in the Norwegian shrimp trawl fisheries. Proceedings of the 7& Russian/Norwegian Symposium: Gear Selection and Sampling Gears. Murmansk, 23-24 June 1997. Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. Richards, A, and Hendrickson, L. 2006. Effectiveness of the Nordmore grate in the Gulf of Maine northern shrimp fishery. Fisheries Research. 81(1): 100-106.		

PI 2.2.2	**There is a strategy in place for managing by-catch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to by-catch populations**	
	SLU observer programme data 2011-2013.	
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.2.3

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main by-catch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main by-catch species taken by the fishery.	Accurate and verifiable information is available on the catch of all by-catch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	There is a prohibition of discarding in the Norwegian fishery, although there may still be some discarding of non-commercial species and small individuals of commercial species. There is no formal observer programme in Norway, so quantitative information on all bycatch species is not available directly from Norwegian vessels. However quantitative information on all bycatch species is recorded by on-board observers on Danish and Swedish vessels fishing in the same area with the trawl and grid and trawl with grid and tunnel, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish vessels provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. Norwegian vessels are permitted to fish inside the 4nm baseline using a trawl without a grid, but there are no comparable data from Danish or Swedish vessels from the same area. Many Norwegian vessels use a grid when fishing both inside and outside the 4nm limit of the Norwegian coastline, so even if some bycatch species constitute more than 5% of the total catch for some fishing trips, these fishing trips will account for only a small proportion of the total fishing trips. Based on information for the Danish and Swedish observer programmes in the same area as the Norwegian fishery, the relatively small proportion of fishing trips which use a standard trawl without a grid, and that the prohibition of discarding in Norway is likely to at least reduce the overall level of discarding in the fishery, the assessment team concluded that there were no main bycatch species for the Norwegian Pandalus fishery as a whole. It cannot be concluded that catch information is accurate for all by-catch species, as it is difficult to find information on non-commercial species and to ascertain the status of affected populations. The SG100 is not met therefore.		
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	N

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch		
	Justification	There were no main by-catch species identified for either the Skagerrak or Norwegian Deep areas of the fishery. The assessment team considers that information should be sufficient to estimate outcome status for most by-catch species, but not enough to do so quantitatively for all by-catch species with a high degree of certainty. The SG100 is not met therefore.		
c	Guidepost	Information is adequate to support measures to manage by-catch.	Information is adequate to support a partial strategy to manage main by-catch 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
	Justification	There were no main by-catch species identified for either the Skagerrak or Norwegian Deep areas of the fishery. There are measures in place for managing and minimizing by-catch including the mandatory use of a sorting grid (except within 4nm of the Norwegian coastline), limits on fishing activity through the setting of an annual TAC and individual vessel quotas, a prohibition on discarding, maximum bycatch limits and real time closures and these measures are considered to constitute a strategy to manage by-catch species. Fishing gear used in the shrimp fishery and the catch compositions may be the subject of inspection by the Coastguard in each country. The Norwegian Coastguard conducted a total of 41 inspections of vessels fishing for shrimp in the North Sea and Skagerrak, and the regional branch of the Norwegian Directorate of Fisheries carried out 19 inspections of shrimp vessels between January 2014 and April 2015 (Modulf Overvik, Directorate of Fisheries, pers. comm.). There is no formal observer programme in Norway, so quantitative information on all by-catch species is not available directly from Norwegian vessels. However quantitative information on all by-catch species is recorded by on-board observers on Danish and Swedish vessels fishing in the same area with same gear, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. The sorting grid is not mandatory within the 4 nm baseline, and there is anecdotal evidence from stakeholders that there is significant bycatch within the component of the shrimp fleet that fishes inside the baseline. There is no quantitative information on bycatch within the baseline, and the assessment team considers therefore that there is not sufficient information to support a strategy to manage all by-catch species, and so the SG100 is not met.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main by-catch 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 by-catch data is conducted in sufficient detail to assess ongoing mortalities to all by-catch species.

PI 2.2.3		**Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch**		
	Met?		N	N
	Justification	There is no formal observer programme in Norway, so quantitative information on all by-catch species is not available directly from the Norwegian fleet. However quantitative information on all by-catch species is recorded under the EU Data Collection Framework by on-board observers on Danish and Swedish vessels fishing in the same area with the same gear, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish vessels provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. These data feed into ICES assessments which can be used therefore to assess whether there has been any increase in risk level posed by the shrimp fishery for bycatch species. Monitoring is not conducted in sufficient detail (low level of sampling of discards) in the Danish and Swedish fisheries to assess ongoing mortalities to all by-catch species. Whilst there is a prohibition on discarding in Norway and therefore all bycatch species should be landed, discarding still occurs in the Norwegian shrimp fleet. Information on total catch composition from the Danish and Swedish vessels fishing in both the Skagerrak and Norwegian Deep provides an upper limit to the amount of bycatch species taken by the fishery in the trawls with grid and trawls with grid and tunnel, but there is a lack of information on the bycatch of small inshore vessels fishing within the 4nm baseline where a grid is not mandatory. The SG80 is not met therefore and a condition is raised to ensure that evidence is provided on the amount of bycatch taken in the Norwegian fishery inside the 4nm baseline.		
References		DTU Aqua observer programme data 2009-2014. SLU Observer programme data 2011-2013		
OVERALL PERFORMANCE INDICATOR SCORE:				**75**
CONDITION NUMBER (if relevant):				**2**

Evaluation Table for PI 2.3.1

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	N

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	Endangered, Threatened and Protected species are defined as those that are recognised as such by national legislation and/or binding international agreement (e.g. CITES) or legislation (e.g. Council Regulation No 43/2014) to which the jurisdictions controlling the fishery under assessment are party. Species that appear exclusively on non-binding lists such as ASCOBANS, IUCN Red List, OSPAR, HELCOM or that are only the subject of intergovernmental recognition (such as FAO International Plans of Action) and that are not included under national legislation or binding international agreement are not considered as ETP under MSC protocols. Examples of species considered as ETP under MSC protocols include harbour porpoise, common skate, thorny skate, thornback rays, porbeagle and basking shark. In Norway ETP species must be recorded in log books, and ETP species are covered by the general prohibition on discarding. Regulation J-250-13 determines that for porbeagle, basking shark, spurdog and silky shark, live individuals of these species should be released immediately, whereas dead or dying individuals should be recorded in the log book (but not necessarily landed). In practice, it cannot be assumed that all captured and released animals are recorded in the log books due to practical constraints of recording at sea or may be recorded under a common name such as “skates”. Directorate of Fisheries figures show that in 2014 there were recorded landings of around 1 tonne of spiny dogfish/spurdog (*Squalus acanthias*) in the shrimp fishery representing 0.02% by weight of the total landings. A few kilograms of cuckoo ray, thornback ray and Norwegian skate were identified by species, and around 13 tonnes of unclassified “skates and rays” (which may include common skate) were recorded as landed in the shrimp fishery representing 0.2% of the total catch in the shrimp fishery. However common skate is extremely rare in the catch from shrimp trawls in Norwegian waters, and during the most recent shrimp survey in January 2015 only 4 thornback rays and no common skate were registered as caught in the survey. There were no recorded captures of porbeagle or basking shark in shrimp trawls, and Directorate of Fisheries figures and fishermen confirm that no marine mammals or birds were caught in shrimp trawls in 2014. There is no observer programme or directed ETP species sampling programme in Norway, so there may be some ETP species captured and discarded which go unrecorded. The observer programme on Danish vessels fishing in the same area as Norwegian vessels provides some evidence of what might go unrecorded in the Norwegian fleet. The Danish fishery recorded some capture of thorny skates which have been added to the Council Regulation in 2015. All captured thorny skate were discarded. No thornback rays (*Raja clavata*) were recorded during the Danish observer programme, but there were small landings of *Raja* spp. recorded in log books, but these rays were not identified by species. In the Danish fishery there was a record of porbeagle catches in 2009, but not in subsequent years. There have been no records of capture of common skate (*Dipturus batis*), although records from the Swedish observer programme show that small numbers of common skate are discarded in some years. In Norway there have been no records of capture of harbour porpoise (*Phocoena phocoena*). It is highly unlikely that marine mammals and cetaceans interact with the shrimp fishery. Northridge (1988) provided several reasons why harbour porpoise normally avoids being caught in trawls, and the assessment team received no reports of harbour porpoises becoming entangled in shrimp trawls, and shrimp trawls do not appear to pose a risk to harbour porpoises (Mats Amundin, Kolmarden, pers. comm.).

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**		
		The assessment team concluded that the effects of the fishery are highly likely to be within limits of national and international requirements for the protection of ETP Species. Monitoring of ETP species in the Norwegian fishery does not include at-sea observers, and so the assessment team considered that there was not a high degree of certainty that effects of the fishery are within limits of national and international requirement. The SG100 is not met therefore.		
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	N
	Justification	Legislation prevents live individuals of many ETP species being retained on board and any catches must be returned to the sea. If this return is done quickly, experimental studies demonstrate that there is a high probability of survival of skates and rays (Mandelman and Farrington 2007, Revill *et al*.2005, Enever *et al* 2009, Enever *et al*. 2010). Electronic log book records of ETP species caught in the Norwegian fishery and levels of discards observed in the Danish and Swedish fisheries in the same geographical area provide evidence that directed fisheries are highly unlikely to create unacceptable impacts on the ETP species considered. The SG100 is not met because of the lack of comprehensive information on capture of ETP species.		
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	N
	Justification	Indirect effects of the fishery such as habitat destruction, destruction of egg cases or competition for forage effects have been considered by the management authorities and are thought to be unlikely to create unacceptable impacts on ETP species based on current knowledge in relation to the population status and life history of potentially impacted ETP species. The SG100 is not met because of the lack of comprehensive information of the indirect effects of the fishery on ETP species. .		
References		Norwegian Directorate of Fisheries, Modulf Overvik, personal communication during site visit Norwegian Ministry of Industry, Trade and Fisheries, Paul Magnus Oma and Geir Ervik, personal communication during site visit. Enever, R., Catchpole, T.L, Ellis, J.R. and Grant, A. 2009. The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research, Volume 97, Issues 1-2, April 2009, Pages 72-76 Enever, R. Revill, A. Caslake, R. and Grant, A. 2010. Discard mitigation increases skate survival in the Bristol Channel. Fisheries Research, Volume 102, Issues 1-2, February 2010, pp. 9-15. EU Council Regulation No. 104/2015 fixing for 2015 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, to Union vessels, in certain non-Union waters, amending Regulation (EU) No		

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**	
	43/2014 and repealing Regulation (EU) No 779/2014. Mandelman, J.W., and M.A. Farrington. 2007a. The estimated short-term discard mortality of a trawled elasmobranch, the spiny dogfish (*Squalus acanthias*). Fisheries Research 83 (2007) 238–245. Revill, A.S., N.K. Dulvy, R. Holst. 2005. The survival of discarded lesser-spotted dogfish (Scyliorhinus canicula) in the Western English Channel beam trawl fishery. Fisheries Research 71 (2005) 121–124.	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.3.2

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	N
	Justification	The fishery has a range of measures in place that are designed to manage impacts of the shrimp fishery on ETP species specifically. In conjunction with regulatory protection of ETP species, and the requirement to record ETP species caught in log books, these measures are considered to constitute a strategy to manage the fishery's impact on ETP species. The general method of operation of the shrimp fishery ensures that the fishery's impact on ETP species is minimised, and is highly likely to achieve national and international requirements for the protection of ETP species. Limits on fishing activity through both total and individual vessel catch quotas, and technical measures in relation to fishing gear, particularly the use of the grid, are measures which limit the mortality of ETP species in the fishery. In Norway ETP species are covered by the general prohibition on discarding, and regulation J-250-13 determines that for porbeagle, basking shark, spurdog and silky shark, live individuals of these species should be released immediately, whereas dead or dying individuals should be recorded in the log book (but not necessarily landed). The SG80 is met therefore. However, there is no evidence that the strategy includes measures for the shrimp fishery that are designed to achieve above national and international requirements for the protection of ETP species, and SG100 is not met.		
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

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	There is an objective basis for confidence that the strategy will work, as there is a high number of measures, a strict control on shrimp fishing activity through annual quotas, and regulations establishing steps to take in the event of interactions with ETP species. ETP species are not directly sampled through an observer programme in Norway and it is therefore not possible to carry out a quantitative analysis. SG100 is not met therefore.		
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	N
	Justification	Most elements of the strategy have been implemented successfully. However the assessment team could not ascertain if all elements of the strategy were fully implemented, and because formal recording of ETP species on log books does not always occur and quantitative analysis of that data does not appear to have been undertaken, the SG100 is not met.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	There are still potentially some failures to record the capture and release of ETP species, so the strategy cannot be considered to be achieving its objective.		
References		EU Council Regulation No. 104/2015 fixing for 2015 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, to Union vessels, in certain non-Union waters, amending Regulation (EU) No 43/2014 and repealing Regulation (EU) No 779/2014.		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 2.3.3

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	N
	Justification	ETP species must be recorded in log books and ETP species are covered by the general prohibition on discarding, so in principle capture of ETP species should be fully recorded. There is no observer sampling in the Norwegian fishery, but observer sampling in the Danish and Swedish fisheries provide additional information that along with recorded captures of ETP species in the Norwegian fishery should be sufficient for the impact of fishing to be quantitatively estimated for these species, but not enough to quantitatively estimate outcome status of ETP species with a high degree of certainty, so the SG100 is not met.		
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	ETP species recorded in log books, the general prohibition on discarding, and estimates of discard rates of ETP species in the fishery area from observer programmes in the Danish and Swedish fishery should be sufficient to determine whether the fishery may be a threat to the protection and recovery of these species. SG 100 is not met as the information is insufficient to evaluate the magnitude of all impacts and injuries caused to ETP species.		
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	The recording on log books of the capture of any ETP species, in conjunction with the prohibition of discarding of any species including ETP species, should provide sufficient information to measure trends and support a full strategy to manage impacts on ETP species. However during the site visit the assessment team received some anecdotal information that some ETP species may be captured and discarded without being recorded on log books. The assessment team **recommends** therefore that systems are put in place to ensure that all ETP species are recorded on log books irrespective of whether they are landed or discarded and that the captures of all ETP species are mapped.
References		**Directorate of Fisheries – landings data from electronic log books**
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.4.1

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	N	N

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
	Justification	Bottom trawl gears are known to impact on habitat structure and function, and areas with biotic habitats generated by aggregations or colonial growth of single species are particularly vulnerable. Maerl and seagrass beds are also considered to be vulnerable to the effects of trawling gears. Habitat-generating species are represented by a wide range of taxonomic groups, e.g. *Porifera*, *Polychaeta*, *Cnidaria*, *Mollusca* and *Bryozoa* (e.g., reviews in Løkkeborg, 2005; Kaiser and de Groot, 2000; Moore and Jennings, 2000, Collie et al., 2000). Reduced impact of bottom trawling on the seabed can be achieved by minimizing the impacted area and by the reduction of the pressure of the gear components on the bottom. The shrimp trawl used in the Norwegian fishery is relatively light in comparison with other trawls and is therefore expected to impact significantly less on habitat features. VMS data of the shrimp fleet demonstrates that most of the fishing activity is confined to soft seabed sediments such as mud and sandy mud in the Skagerrak. There are a number of Natura2000 sites designated in the Skagerrak in particular the Skagens glen and the Bratten, and the OSPAR Commission lists a number of sensitive habitats that can be found in the Skagerrak. These include coral gardens, deep sea sponge aggregations, Zostera beds, *Lophelia pertusa* reefs and seapen and burrowing megafauna communities but shrimp trawling is unlikely to occur in the more complex habitats because the Norwegian shrimp vessels do not use rockhopper gear, and fishermen will actively avoid any area where the gear might become entangled. Experimental and modelling studies show that the impacts of trawling are generally greatest in areas of low levels of natural disturbance, and small in areas of high natural disturbance (e.g. Hiddink et al., 2006). Demersal trawling has a significant initial effect on muddy and sandy-mud habitats, but these effects have been shown to be short lived with an apparent long-term, positive, post-trawl disturbance response (Kaiser et al, 2006). This positive response may represent an increase in the abundance of smaller bodied fauna, but a possible overall decrease in biomass (Jennings et al, 2001, Duplisea et al., 2002). In dynamic sandy sediments, recovery is likely to be faster since the associated communities are accustomed to higher levels of natural disturbance (Kaiser et al., 1998). Benthic macrofauna are most affected by trawling activity; whereas burrowing and other smaller seabed fauna are less vulnerable (Bergmann and Santbrink, 2000; Dinmore et al, 2004). The rates of recovery for benthic communities following intensive trawling disturbance may range from weeks to years with rates of recovery depending on rates of immigration, recruitment and growth (Schratzberger and Jennings, 2002). Slow-growing large biomass biota such as sponges and soft corals are known to take much longer to recover than biota with shorter life spans such as polychaetes (less than a year) (Kaiser et al., 2006). Under CR 27.10.7, the assessment team is required to score this PI according to the different scoring elements (habitats/VMEs) that comprise the habitat component potentially affected by the fishery. In scoring this PI, the assessment team considered five separate scoring elements (VME habitats) – coral gardens, deep sea sponge aggregations, *Zostera* beds, *Lophelia pertusa* reefs and seapen and burrowing megafauna communities. In considering the potential impact of the fishery, the assessment team took into account the distribution of fishing activity as demonstrated by the data on distribution of fishing activity in Figure 15 and knowledge of the activity of small coastal vessels in relation to known distribution of the five VME habitats, the bio-regional distribution of habitat types, the irregular reproduction and slow growth rates of the vulnerable species with the consequent slow recovery rates, the nature of the fishing gear used, and the behaviour of fishermen in avoiding habitats which might damage the fishing gear. The distribution of fishing activity of Norwegian shrimp vessels as described by Figure 15 and knowledge of the activity of small coastal vessels confirms that the key Natura 2000 site in which Norwegian shrimp trawling occurs is the Bratten.

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
		There is also some fishing activity in the Skagens Gren area, but Norwegian vessels do not fish in the inshore areas of Koster and Varedofjorden and Gullmarsfjorden. Coral gardens. Horn corals which together form coral gardens have a fragile structure that makes them vulnerable to damage by fishing gear, and as such have been designated as a threatened habitat by OSPAR. Coral gardens have been extensively mapped within the Bratten Natura 2000 site and may also be found in the Kosterfjorden and Gullmarsfjorden. In addition to the high diversity of species observed in the Bratten, the area is also heavily fished by Danish and Swedish vessels and the broad-scale map of shrimp fishing activity (Figure 15) suggests that Norwegian shrimp fishing may occur in areas of the Bratten where coral gardens are present. However shrimp fishermen use light-weight trawls and do not use rockhopper gear to target more complex habitats, and will therefore avoid areas such as coral gardens where the gear might become entangled. For the Bratten area, Figure 20 shows the known distribution of coral gardens and the proposed closed areas, and Figures 23 and 24 show that there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) in those areas, from which we can conclude that fishermen will avoid areas in which coral gardens are found. In addition to the evidence of avoidance of coral gardens by fishermen in the Bratten, coral gardens have been protected in the Skagens Gren Natura 2000 site since 2011, fishing is not permitted in the Kosterfjorden in the most sensitive environments, and additional regulations on shrimp fishing have been proposed in 2015, and fishing activity is very tightly controlled in the Gullmarsfjorden. Coral gardens are protected from potential damage by fishing gears in three Natura 2000 sites, and information on fishing activity in the Bratten area and on the known distribution of coral gardens in the Bratten provides evidence that the SG60 is met. However some species of horn corals are found only in Bratten, and full protection for these corals is not yet in place in the Bratten. The assessment team concluded therefore that the fishery cannot be considered to be highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, and thus the fishery does not meet the SG80 for coral gardens. Deep sea sponge aggregations. Deep sea sponge aggregations are designated by OSPAR as threatened habitats. They are known to occur between water depths of 250-1300m (although they are also found in shallower waters such as the Kosterfjorden) and may be found on soft substrata or hard substrata, such as boulders and cobbles which may lie on sediment. Deep-sea sponges have similar habitat preferences to cold water corals, and hence are often found at the same location. Shrimp fishermen use light-weight trawls and do not use rockhopper gear to target more complex habitats, and will therefore avoid areas such as deep sea sponge aggregations where the gear might become entangled. Deep sea sponge aggregations are found extensively in OSPAR region 1, but also in a number of areas in the eastern Skagerrak (OSPAR, 2010a). Their known occurrences in the Bratten area are shown in Figure 21 in relation to proposed closed areas which are designed to protect both sponges and coral gardens, and Figure 23 shows that there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) in those areas, from which we can conclude that fishermen will avoid areas which support deep sea sponge aggregations. Deep sea sponge aggregations are also found in the Kosterfjorden

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
		where fishing is not permitted in the most sensitive environments and additional regulations on shrimp fishing have been proposed in 2015. This protection of sponges in the Kosterfjorden, and along with information on fishing activity in the Bratten area and on the known distribution of deep sea sponges in the Bratten provides evidence that the SG60 is met. However the main location of sponges in the Skagerrak is in the Bratten, and full protection from potential damage by fishing gear in the Bratten is not yet in place, and so the assessment team concluded therefore that the fishery cannot be considered to be highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, and thus the fishery does not meet the SG80 for deep sea sponge aggregations. *Zostera* beds. *Zostera* is generally found in depths up to 10m, and in southern Sweden it flourishes in stony and sandy bottoms in 2-4m depth. It is highly unlikely that there is significant overlap of Norwegian shrimp fishing activity with the bio-regional distribution of *Zostera* in coastal waters, and so the fishery is highly unlikely to cause serious or irreversible harm to *Zostera* habitat. SG80 is met therefore for this VME. *Lophelia pertusa* reefs. *Lophelia pertusa* is a cold water reef-forming coral widely distributed across the north-east Atlantic. Reefs occur from 200 to 2000m depth along the continental slope, but also in shallower waters in Norwegian fjords and along the Swedish west coast in the Skagerrak. *Lophelia* reefs provide complex structural habitat and are susceptible to damage by fishing gear. Whilst *Lophelia* are relatively widespread in OSPAR region 1, they are less common in region 2 but are found in the northernmost area of the Skagerrak close to the coast (Hall-Spencer and Stehfest, 2009). There is potential for some overlap of shrimp fishing activity with *Lophelia* reefs, but the fishing activity data suggests that Norwegian vessels fish to the south of the main concentration of reefs. In addition, experience in this fishery and other fisheries for *Pandalus borealis* suggest that fishermen will avoid areas of *Lophelia* reefs to ensure that the fishing gear does not become entangled. *Lophelia* reefs are protected in the Kosterfjorden. Although there is a very restricted distribution of *Lophelia* in the Skagerrak compared with other areas such as the Norwegian west coast, the assessment team considered that the fishery would be highly unlikely to cause serious or irreversible harm to *Lophelia* populations in the region. The fishery therefore scores 80 for this scoring element. Seapen and burrowing megafauna communities. Seapen and burrowing megafauna are found on plains of fine mud at water depths ranging from 15-200 m or more which is habitat that occurs extensively in sheltered basins of fjords and in deeper offshore waters. Seapen and burrowing megafauna communities (soft bottoms with large soft corals) have been identified by OSPAR as a special protective habitat which acts as a host for species such as the brittlestar *Asteronyx loveni*. The known distribution of these habitats within the Bratten is primarily within the proposed closed areas (Figure 22), in which there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) (Figure 23). Seapen and burrowing megafauna communities are also found in Kosterfjoreden and in areas off the southern Norwegian coast (Figure 18; OSPAR, 2010b) that do not overlap with current fishing activity. The assessment team concluded therefore that the risk of serious or irreversible damage from the shrimp fishery on this habitat type on a bio-regional basis was low and therefore the SG80 was met. Aggregated score – as three scoring elements meet the SG80, and two scoring elements do not meet the SG80, the overall score for PI 2.4.1 is 75.
References		Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic populations caused by trawl fisheries on the Dutch continental shelf in the North

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
	Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331. Collie, J.S., Hall, S.J., Kaiser ,M.J., and Poiner, I.R. 2000. A quantitative analysis of fishing impacts on shelfsea benthos. Journal of Animal Ecology, 69: 785-798. Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. Duplisea, D. E., Jennings, S., Warr, K. J., and Dinmore, T. 2002. A size-based model of the impacts of bottom trawling on benthic community structure. Canadian Journal of Fisheries and Aquatic Science, 59: 1785–1795. Hall-Spencer, J.M. and Stehfest, K.M. 2009. Assessment of *Lophelia pertusia* reefs in the OSPAR region. OSPAR Background Document. Hiddink, J.G., Jennings, S., Kaiser, M.J., Queirós, A.M., Duplisea, D.E. and Piet, G.J. 2006. Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Science, 63: 721-736 Jennings, S., Dinmore, T.A., Duplisea, D.E., Warr, K.J., Lancaster, J.E., 2001. Trawling disturbance can modify benthic production processes. J. Animal Ecol. 70, 459-475. Kaiser, M.J., and De Groot, S.J. 2000. Effects of Fishing on non-target Species and Habitats. Blackwell, Oxford. Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. Kilnäs, M., 2013. Proposal for regulation of the fishery in the Bratten area. Report from the project “Sea meets the Land”. Løkkeborg S. 2005. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO fisheries technical paper 472, 69 p. Moore, G., and Jennings, S. 2000. Commercial fishing: the wider ecological impacts. British Ecological Society, Blackwell Science, Cambridge. OSPAR Commission, 2010a. Background Document for Deep Sea Sponge Aggregations. OSPAR Commission, 2010b. Background Document for Seapens and Burrowing Megafauna Communities. Schratzberger, M., T.A. Dinmore and S. Jennings, 2002. Impacts of trawling on the diversity, biomass and structure of meiofauna assemblages. Mar. Biol. 140:83-93.
OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**3**

Evaluation Table for PI 2.4.2

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	N
	Justification	Based on the data on the position of trawl hauls from the electronic log books , most of the fishing effort of the Norwegian shrimp fleet takes place over soft seabed sediments such as mud and sandy mud. Skagerrak is a well-studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). The establishment in 2009 of the Kosterhavet National Park as the first marine national park in the Skagerrak demonstrated a key step forward in the management of marine habitat types. Within the National Park there is a ban on trawling in the most sensitive areas. There are a series of Natura2000 sites designated in the Skagerrak and coral reefs are protected in Skagens gren and Gullmarsfjorden, where there are also tight restrictions on fishing activity. In addition to areas designated already, there are also a number of other proposals for conservation sites by NGOs. In the Väderöfjorden and Kosterhavets nationalpark (Kosterfjordens), and in the Gullmarsfjorden shrimp trawling is permitted but the fishery is closely regulated. The Bratten area is protected and in 2014 proposals for strong restrictions on fishing activity were drawn up by Sweden, Denmark and Norway in consultation with all interested parties. The proposals, which have been submitted to the Swedish Agency for Marine and Water Management (SwAM), include no fishing zones, reduced fishing effort, AIS on all vessels and no anchoring. The Bratten area is in the Swedish economic zone, but much of it is outside the 4nm baseline and so is managed under the Common Fisheries Policy of the European Union. Implementation of new regulations will therefore require EU ratification. In addition to the habitat designations, the application of the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems is enshrined within the EU CFP, and there are a suite of measures in place, such as catch quotas, effort limitation and gear restrictions which limit the impact of the gear on non-target species and the environment. The absence of fishing in some areas of the distribution of the five key VMEs can be considered to be a measure that manages the impact on habitat, and fishermen will also try to avoid ground where the fishing gear will get snagged. In addition regulation J-128-2011 requires that “collisions” between fishing gear and corals and sponges (defined by 60 kg corals or 800 kg of sponges) must be reported and move-on rules apply. All of these measures can be considered to contribute to a partial strategy for managing the impact of the fishery on the five vulnerable habitat types. The SG80 is met therefore for all scoring elements. In the absence of closure of all VME hotspots, a full strategy is not in place and so the SG100 is not met for any of the scoring elements.		

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		
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	N	N
	Justification	There is an objective basis for confidence that a partial strategy for managing the impact on habitat types that includes limitations on fishing effort through catch limits, the absence of fishing in many areas of the distribution of VMEs, the avoidance of VME habitats by fishermen to safeguard their fishing gear and the closure to fishing of the key VME hotspots will work as it will minimise the potential interaction of fishing with VME habitats. For *Lophelia* reefs and *Zostera* beds which are primarily found in the Skagerrak in shallower waters which are covered by the restriction on fishing in the most vulnerable areas, there is therefore an objective basis for confidence that the partial strategy will work and so the SG80 is met. For coral gardens, deep sea sponge aggregations and seapen and burrowing megafauna VMEs, fishing restrictions in some of the most vulnerable areas, e.g. the Bratten, are not yet fully in place and so the SG80 is not met. The SG80 is not met therefore for all scoring elements, and so a condition is raised		
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	There are a large number of Natura2000 sites designated in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden, Gullmarsfjorden). The establishment of these protected areas, current regulations protecting the most sensitive habitats, and the ongoing introduction of new regulations, the suite of management measures that regulate the level of fishing and the avoidance of rough ground by fishermen are all measures that are in place and provide evidence that the partial strategy is being implemented successfully. The SG80 is met therefore for all scoring elements. A full strategy is not currently in place so the SG100 is not met for all scoring elements.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			N
	Justification	There is only a partial strategy rather than a full strategy in place, and therefore the SG100 is not met.		

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	
References	http://natura2000.eea.europa.eu/# www.ospar.org www.searchmesh.ne	
OVERALL PERFORMANCE INDICATOR SCORE:		75
CONDITION NUMBER (if relevant):		4

Evaluation Table for PI 2.4.3

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	N
	Justification	The Skagerrak has been well studied by different organisations, and the sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). In addition NGOs such as WWF, OCEANA and Greenpeace have also been involved in the study of the distribution of habitat types in these areas. In particular the nature, distribution and vulnerability of all five scoring elements (coral gardens, deep sea sponge aggregations, *Zostera* beds, *Lophelia* reefs and seapens and burrowing megafauna) are well known in the Natura 2000 sites relative to the scale of information on fishing activity available from data on position of haul trawls. The assessment team considered that whilst there is a good understanding of the main VME habitats in the fishery and so SG80 is met for all scoring elements, new information is becoming available all the time and new Marine Protected Areas are being proposed, implying that the distribution of all vulnerable habitats is not fully known at present. SG100 is not met therefore for all scoring elements.		
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	There is a good understanding of the distribution of the five VME habitat types across the fishing area which coupled with vessel plotter data and VMS data for the fleet (screened for fishing activity) provides a clear understanding of the spatial extent of the interaction between gear and habitat, and in conjunction with empirical evidence of the nature of impact of trawling on all scoring elements, allows an assessment of the potential impact of fishing on habitat types. The SG80 is met therefore for all scoring elements. The physical impacts of the fishing gear on the various VME habitat types have not been quantified fully and so the SG100 is not met for all scoring elements.		

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**		
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?		N	N
	Justification	Fishing activity data continue to be collected on an ongoing basis for the fishery, and so any changes in the distribution of fishing activity in relation to sensitive, vulnerable or protected habitats can be detected. A key component of a full strategy to manage the impact of the fishery on VME habitats is the implementation of clear "move-on" rules when VME habitats are encountered. Regulation J-128-2011 requires that "collisions" between fishing gear and corals and sponges (defined by 60 kg corals or 800 kg of sponges in a haul) must be reported and move-on rules apply. This regulation has now been replaced by J-40-2016 which defines new threshold levels of 30 kg of corals and 400 kg of sponges in a haul. However in practice the use of sorting grids in the Norwegian shrimp fishery ensures that any large (>20mm) benthic bycatch will pass through the grids and will not be caught by the trawls. It is possible therefore that the encounter thresholds specified under J-40-2016 may never be reached when the trawl is towed in areas with high abundance of corals and sponges or other VME habitats. Interactions between fishing gear and VME habitats may go unrecorded in areas where VME habitats have not been previously recorded unless there is a mechanism in place for recording such encounters in fishermen's log books. It was concluded that there are not sufficient data being collected to detect any increase in risk to the five VME habitats. The SG80 is not met therefore for any of the scoring elements. Whilst changes in the five VME habitats may be identified and sufficient data are collected under the Habitats Directive and under commitments to OSPAR, it cannot be concluded that changes in habitat over time are measured, so the SG100 is not met for any of the scoring elements.		
References		http://natura2000.eea.europa.eu/# www.ospar.org www.searchmesh.net		
OVERALL PERFORMANCE INDICATOR SCORE:				**75**
CONDITION NUMBER (if relevant):				**5**

Evaluation Table for PI 2.5.1

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	N
	Justification	The one remaining impact of the fishery on the ecosystem that has not been covered previously under the assessment of P1 and P2 performance indicators is the impact on trophic relationships of removal of shrimps. The structure and function of the North Sea ecosystem is well known, and the Mackinson and Daskalov (2007) ecosystem model of the North Sea documents the trophic level and predator-prey relationship between 68 different species, from cetacean to polychaete. The model is designed to address questions regarding processes that occur over the whole North Sea and on time scales greater than one year. As such the model is designed to help address strategic long-term questions such as those relating to the long-term ecosystem effects of changes in fishing activity and climate. Shrimp is a low trophic species and an important prey item for cod and other species. Predator abundance indicators varied little over the last nine years of surveys (NAFO/ICES, 2015) and were found not to hold any information regarding shrimp stock dynamics (Hvingel, 2005). Stock biomass of shrimp is relatively low at present in comparison with historical levels, there has been a recent decline in predator fish species, and shrimp fishing occurs in a relatively small proportion of the total area of the Skagerrak and Norwegian Deep. It is considered highly unlikely therefore that the shrimp fishery will disrupt ecological relationships within the ecosystem as a whole. Research studies in other fisheries suggest that shrimp trawling has very little impact on the benthic community. For example, Gordon *et al*. studied the effects of otter trawling on benthic habitat and communities on Western Bank and results indicated very limited immediate impacts on the benthic community. The assessment team concluded on the basis of the relatively low level of shrimp fishing activity, and the results of experimental and modelling studies that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to cause serious or irreversible harm and so the SG80 is met. This conclusion is drawn partially by inference rather than from empirical evidence available for this specific fishery on the ecosystem effects of fishing and so there is not sufficient evidence to meet the SG100.		
References		Gordon, J.D.M. and de Silva, S.S. (1980). The fish populations of the West of Scotland Shelf. Part I, Oceanographic Marine Biology Annual Review, 18, 317-366. Hvingel, C. 2005. Deriving Quantitative Biological Advice for the Shrimp Fishery in Skagerrak and Norwegian Deep (ICES Divisions IVa east and IIIa). *NAFO SCR Doc. 05/84.* Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland,		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
	Canada. ICES CM 2015/ACOM:14. Parsons, D.G., 2005. Predators of northern shrimp, *Pandalus borealis*, (Pandalidae) throughout the North Atlantic. Marine Biology Research, 1: 59 – 67.	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.5.2

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 team considers that there are measures in place, such as the establishment of Natura 2000 sites, the implementation of catch quotas in the shrimp fishery, restrictions on fishing capacity and effort and the use of selective gears and the implementation of the cod recovery plan, all of which should ensure that the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function. In addition in 2013 Norway published a Management Plan for the North Sea and Skagerrak to help meet the requirements of international environmental targets including the requirement to achieve Good Environmental Status (GES) of marine waters by 2020 as prescribed under the EU Marine Strategy Framework Directive (MSFD). Key descriptors of GES include healthy status of fish and shellfish stocks and maintenance of trophic relationships and marine food webs. The scientific basis of the Norwegian management plan was prepared by an Expert Group with representatives from all the key scientific organisations and includes proposals for a set of indicators to be used in a coordinated monitoring programme for the North Sea and Skagerrak ecosystems. The report suggests reference values and action thresholds for the indicators and suitable monitoring stations and survey transects, based on existing time series where possible. Indicators include physical and chemical parameters, plankton, benthic fauna, fish stocks, marine mammals, seabirds, threatened species, alien species, occupation of areas and pollution. In addition to these state indicators, there are pressure indicators proposed for the petroleum, fisheries, maritime traffic and other sectors. For the fisheries sector, the proposed pressure indicators are harvest level, bottom trawling activity, size index and bycatch including bycatch of threatened species. The SG100 is met therefore.		
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.

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		
	Met?	Y	Y	Y
	Justification	Legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations, such as the EU-Norway discard ban agreement for the Skagerrak Sea which was endorsed by the European Parliament in April 2013. The strategy takes into account this legislation, information from the ICES Advisory Committee of Ecosystems (ACE), impact of the fishery on the status of the shrimp stock, predator abundance indicators from Norwegian ecosystem stock surveys, and potential impact on other by-catch species. The assessment team considers that the strategy is expected to restrain the impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. Within the Norway management plan the proposed reference values and action thresholds for the state indicators and the pressure indicators for the fisheries sector (harvest level, bottom trawling activity, size index and bycatch including bycatch of threatened species) provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm. The SG100 is met therefore.		
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	N
	Justification	The strategy involves a combination of spatial management measures (designated protected areas) and fishery-specific management measures (catch quotas, effort control, mandatory use of selective gears) and the proposal of reference values and action thresholds for the indicators developed in the Norwegian management plan. Experience from all fisheries suggests that the strategy is likely to work in ensuring that the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function. Currently there is a lack of specific management measures linked to the designation of protected areas within the North Sea and Skagerrak and so the SG100 is not met.		
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	N
	Justification	The designation of Natura 2000 sites, fishing capacity and effort control, management of the fishery, mandatory use of selective gear, inspections on board and at the landing port, and the development of the Norwegian management plan for the North Sea and Skagerrak suggests that the strategy is being implemented successfully. The Norwegian management plan has only recently been drawn up, and there is insufficient information about the effect of all measures such as the reduction of impact on bottom habitat to conclude that there is evidence that all measures taken are implemented successfully and so the SG100 is not met.		

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	ICES, 2015c. Mixed fisheries advice for ICES Subarea IV (North Sea) and Divisions IIIa North (Skagerrak) and VIId (Eastern Channel). ICES Advice 2015 Book 6.2.2.2. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. EU Council Regulation No. 105/2015 fixing for 2015 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, to Union vessels, in certain non-Union waters, amending Regulation (EU) No 43/2014 and repealing Regulation (EU) No 779/2014. Institute of Marine Research, 2013. Summary of proposed indicators for a monitoring programme. Scientific basis for an integrated management plan for the North Sea and Skagerrak. 11pp. Norwegian Ministry of Environment, 2013. Integrated Management of the Marine Environment of the North Sea and Skagerrak (Management Plan). Meld. St. 37 (2012–2013) Report to the Storting (white paper). http://ec.europa.eu/environment/marine/good-environmental-status/index_en.htm	
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 2.5.3

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	Relevant information is available to understand the key elements of the ecosystem and its functions. These key elements include the trophic structure of the Skagerrak ecosystem, such as prey, predators and competitors, community composition, productivity patterns and biodiversity characteristics. Skagerrak fisheries have been studied in detail and ICES stock assessment reports also provide information from which the status of the different components of the fishery can be evaluated. The assessment team considers that the information is adequate to broadly understand the key elements of the ecosystem and so the SG80 is met.		
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	N
	Justification	The main impacts of the fishery on these key ecosystem elements can be inferred from existing information, such as the Mackinson & Daskalov (2007) Ecopath model of the North Sea. This model is able to answer questions such as the response of the ecosystem to changes, and can be used as a basis for the design of policies aimed at implementing ecosystem management principles, and can provide testable insights into changes that have occurred in the ecosystem over time. The main interactions between the shrimp fishery and these ecosystem elements have not been fully investigated and so the SG100 is not met.		
c	**Guidepost**		The main functions of the Components (i.e., target, By-catch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, By-catch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	N

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	*P. borealis* is a low trophic species and its relationships with other species are generally known. The main functions of the Components (i.e. target, By-catch, Retained and ETP species and Habitats) in the ecosystem are known. However direct and indirect impacts of the fishery on both ETP species and seabed habitats are not sufficiently well quantified to meet the SG100.		
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	N
	Justification	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the some but not all of the main consequences for the ecosystem to be inferred. These data are sufficient to allow the main impacts on these components to be inferred directly. However direct and indirect impacts of the fishery on both ETP species and seabed habitats are not sufficiently well quantified to meet the SG100.		
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 team considers that information is sufficient to support the development of strategies to manage ecosystem impacts. In addition sufficient data continue to be collected through various organisations. Data are routinely collected on an ongoing basis to enable the detection of any change or increase in risk level to the main ecosystem components. ICES Mixed fisheries advice report for the North Sea (2015) (which includes Skagerrak), gives an overview of the stocks of different species and marks a path towards ecosystem management. This advice indicates that sufficient data are collected to support the development of strategies to manage ecosystem impacts.		
References		ICES, 2015c. Mixed fisheries advice for ICES Subarea IV (North Sea) and Divisions IIIa North (Skagerrak) and VIId (Eastern Channel). ICES Advice 2015 Book 6.2.2.2. Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp DTU Aqua observer programme, 2009-2014.		

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
OVERALL PERFORMANCE INDICATOR SCORE:	85
CONDITION NUMBER (if relevant):	

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 Trade, Industry and Fisheries, 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 North Sea provides for cooperation between different sector authorities, such as the Ministry of Trade, Industry and Fisheries and the Ministry of Environment. The national 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, at the national level, insofar as it constitutes a coherent set of rule-making practices. At the international level, shrimp is managed through annual agreements between Norway and EU on the regulation of fisheries in the North Sea and on the Skagerrak and the Kattegat. These are based on the Framework Agreement between the EU and Norway Council Regulation ((EEC) 2214/80 of 27 June 1980).		
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.
	Met?	Y	Y	N

<table>
<tr><td colspan="2">PI 3.1.1</td><td colspan="3">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.</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">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 in The Hague and the International Tribunal for the Law of the Sea in Hamburg, or bring a dispute in to the Permanent Court of Arbitration in The Hague. This has so far not been widely used a means for solving fisheries disputes, but more in disputes about jurisdiction. The same holds true for dispute resolution mechanisms within NEAFC. However, in 2013 the Faroes referred the EU to the Permanent Court of Arbitration for breach of the obligation under the United Nations Convention on the Law of the Sea (UNCLOS) to refrain from any measures capable of prejudicing the decision and, in general, avoid taking any steps which might aggravate or extend the dispute related to the management of Atlanto-Scandian herring. Hence, dispute resolution mechanisms exist at the international level that are appropriate to the context of the fishery, although they have not yet been tested and proven to be effective.</td></tr>
<tr><td rowspan="3">d</td><td>Guidepost</td><td>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.</td><td>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.</td><td>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.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>Y</td></tr>
<tr><td>Justification</td><td colspan="3">There are no people identified that are particularly dependent on fishing shrimp for food and livelihood that applies to this fishery. 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.</td></tr>
<tr><td colspan="2">References</td><td colspan="3">➢ Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act)
➢ The Atlanto-Scandian Herring Arbitration (The Kingdom of Denmark in respect of the Faroe Islands v. The European Union), Permanent Court of Arbitration, The Hague, 2013
➢ https://www.regjeringen.no/no/tema/mat-fiske-og-landbruk/fiske-og-</td></tr>
</table>

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.**	
	havbruk/rydde-internasjonalt/fiskerisamarbeidet-med-eu/id437333/ ➢ Interviews with representatives of the Directorate of Fisheries, the Institute for Marine Research, the Norwegian Fishermen's Association, the sales organization for Rogaland and the sales organization Skagerakfisk during the site visit ➢ 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:		**95**
CONDITION NUMBER (if relevant):		

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 Trade, Industry and Fisheries, the Directorate of Fisheries and the Coast Guard, sales organizations such as the fishermen's sales organization for Rogaland and Skagerakfisk, fishermen's organizations such as the Norwegian Fishermen's Association and environmental NGOs such as Greenpeace, WWF and the Norwegian Society for the Conservation of Nature. The roles, functions and responsibilities of the various actors are clearly defined in longstanding 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 international level, the relationship between the NEAFC signatories is explicitly defined in the NEAFC Convention and the relationship between Norway and EU in the framework agreement between the two parties. Functions, roles and responsibilities are well understood for all areas of responsibility and interaction.		
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	N

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 organizations. 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 and NGOs attend on a regular basis. In addition there is day-to-day contact by telephone and email between authorities, user-groups and other interested parties. User-groups such as the Norwegian Fishermen's Association also participate at the international level, e.g. in the annual negotiations between Norway and EU. Norwegian management authorities actively seek advice from user-groups in preparation for all international consultations and negotiations. Consultation processes are inclusive and transparent, but the assessment team has not been provided with documentation that management authorities always explain how stakeholder input is used or not used.		
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
	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 as full delegation members in the EU–Norway negotiations, while NGOs may participate as observers at meetings in regional organizations such as NEAFC and OSPAR.		
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 Directorate of Fisheries, the Institute for Marine Research, the Norwegian Fishermen's Association, the sales organization for Rogaland and the sales organization Skagerakfisk during the site visit ➢ Minutes from the Regulatory Meeting 5-6 November, 2014 ➢ NEAFC Convention, 2007		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				

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
	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 international level, the 2007 NEAFC Convention also requires the precautionary principle to be used.		
References		➢ Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) ➢ NEAFC Convention, 2007 ➢ 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 (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):				

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 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 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.		
References		➢ Act of 6 June 2008 no. 37 relating to the Management of Wild Living Marine Resources (the Marine Resources Act) ➢ Annual strategic risk assessments, Directorate of Fisheries ➢ Interviews with representatives of the Directorate of Fisheries, the Institute for Marine Research, the Norwegian Fishermen's Association, the sales organization for Rogaland and the sales organization Skagerakfisk during the site visit		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

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	P
	Justification	According to GSB4.7, this PI deals only with the fishery-specific context such as within a national authority specifically applied to the fishery under assessment. Well defined and measurable short and long-term objectives consistent with achieving the outcomes of MSC Principles 1 and 2 are explicit in the Norwegian Marine Resources Act and supporting legislation on the Norwegian shrimp fishery. This includes objectives to maintain fish stocks at sustainable levels (here: both target stocks and other retained species) and protect other parts of the ecosystem, such as habitats. These 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). The team considers that objectives for Principle 1 are adequate to meet the SG 100 requirement. However short and long-term objectives for Principle 2 are also explicit within the management system, but are not considered sufficiently well defined and measurable to warrant a 100 score. A partial score of 90 is given therefore for this PI.		
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 Directorate of Fisheries, the Institute for Marine Research, the Norwegian Fishermen's Association, the sales organization for Rogaland and the sales organization Skagerakfisk during the site visit		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				

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 Trade, Industry and Fisheries 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. The EU–Norway agreement also shows that decision-making processes are in place, e.g. on TAC, that result in measures and strategies to achieve fishery-specific objectives. Independent scientific advice is sought each year and there is a commitment given within the EU–Norway agreement to adhere to the ICES advice provided. These decision-making processes are now well-established.		
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	The well-established decision-making procedures at national level in Norway respond to issues identified in research, monitoring, evaluation or by groups with an interest in the fishery through the arenas for regular consultations between governmental agencies and the public. This happens first and foremost at 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.		
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 Norwegian legislation that requires fisheries management to be based on the precautionary approach (see 3.1.3). The NEAFC and OSPAR Conventions also require the precautionary approach to be used in decision making.		
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	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	The Ministry of Trade, Industry and Fisheries 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 submitted to all relevant stakeholders.. 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. Every regulation, big or small, goes through extensive public hearings. For example the briefing papers sent to all stakeholders before regulatory meetings go through the background and rationale of all quotas and technical regulations Likewise, at the international level, information on fishery performance is available from ICES and NEAFC, but formal reporting is not available to all interested stakeholders.		
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 national 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		➢ 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 Directorate of Fisheries, the Institute for Marine Research, the Norwegian Fishermen's Association, the sales organization for Rogaland and the sales organization Skagerakfisk during the site visit		

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.**	
	➢ Minutes from the Regulatory Meeting 5-6 November, 2014	
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

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	N

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 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, or more specifically Electronic Reporting Systems (ERS). This implies that real-time data are forwarded to the Directorate of Fisheries, with the possibility to make corrections of data submitted each day within 12 hours into the next day. Norway has agreements in place with the EU, Russia and Iceland about exchange of ERS data, and is working actively to reach agreement on similar arrangements with the Faroe Islands and Greenland. 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. They check, among other things, weighing equipment, quantity and size distribution of the catch, the quality of the fish and documentation. 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. All landings have to be reported six hours in advance in order to give the inspectors the possibility to check the landed catch. The landed volumes are compared to the volumes reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment. The Coast Guard is administratively part of the Norwegian Navy but performs tasks on behalf of several ministries, including the Ministry of Trade, Industry and Fisheries. 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. However, high-grading has been identified as a challenge in this fishery – although it is not considered to occur on a regular basis; cf. 3.2.3 c) below – the lack of permanent observers on board implies that the system cannot be considered as sufficiently comprehensive and able to consistently demonstrate an ability to enforce all regulations. Hence, a 100 score is not warranted.

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
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
	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. From January 2014 to April 2015, the Directorate of Fisheries' regional office for the North Sea and Skagerrak carried out 19 inspections of fishing vessels. Infringements serious enough to lead to prosecution were found at three inspections. The Coast Guard conducted 41 inspections of vessels fishing shrimp in the North Sea and Skagerrak during 2014. As a result of these inspections, four cases were reported to the police for prosecution. The comprehensive enforcement system combined with the relatively high level of compliance (serious infringements found in 10-15 per cent of inspections) 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	N
	Justification	As follows from 3.2.3 b), the compliance level in this fishery is relatively high as far as catch (volumes), gear and area restrictions are concerned. However, since there are no observers on board the shrimp vessels, it cannot be excluded that that high grading does take place. Thus there is not a high degree of confidence that the fishers comply with all regulations, and SG 100 is not met.		
d	**Guidepost**		There is no evidence of systematic non-compliance.	
	Met?		Y	

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with
	Justification	As demonstrated under 3.2.3 b) and c) above, the level of compliance in the shrimp fishery is relatively high, and there is no evidence of systematic non-compliance. Since the Norwegian enforcement system does not use observers on board the fishing vessels, it cannot be excluded that high grading does not take place. However, in the opinion of the assessment team there is less reason to expect high grading to occur in the Norwegian than, e.g., the Swedish shrimp fishery since it is regulated through an Olympic system with periodic restrictions rather than by fixed vessel quotas.
References		➢ Email correspondence with the Norwegian Coast Guard and the Norwegian Directorate of Fisheries ➢ Interviews with representatives of the Directorate of Fisheries, the sales organization for Rogaland and the sales organization Skagerakfisk during the site visit
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		

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	N
	Justification	The North Sea and Skagerrak marine ecosystems are well-studied. Research conducted by research institutes in Sweden, Norway and Denmark has resulted in the publication of a number of scientific publications on different aspects of the stock and the ecosystem. At national level in Norway, research is planned by IMR, in dialogue with the Ministry of Trade, Industry and Fisheries. The research projects undertaken cover, among other things, stock size, structure and distribution of fish and shrimp, fishing technology and selectivity of fishing gear, sustainable harvesting of commercial species and the monitoring of the populations of marine mammals and birds. Research is also planned in the ICES Pandalus Working Group (NIPAG). Hence, the research plan provides the management system with timely information in order to achieve P1 and P2 objectives. However, it may not be considered comprehensive with a coherent approach to research as it is delivered via several mechanisms. Further, P3 issues are not covered, and hence SG 100 is not met.		
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	N
	Justification	Research plans and results are published on websites, e.g. on the websites of ICES and IMR, as publicly available research reports and as journal articles. They are also actively disseminated, primarily through emailing lists. As the 'research plan' is derived from several different sources (see 3.2.4 a)), it cannot be concluded that the research plan and results are widely and publicly available, and SG 100 is not met.		
References		➢ Interviews with representatives of the Directorate of Fisheries, the sales organization for Rogaland and the sales organization Skagerakfisk during the site visit ➢ www.ices.org ➢ www.imr.no		

PI 3.2.4	The fishery has a research plan that addresses the information needs of management
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

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	N
	Justification	The Norwegian fisheries management system is reviewed by the Parliament upon submission by the Government (through the Ministry of Trade, Industry and Fisheries) of annual reports on the state of affairs in Norwegian fisheries management. At the Regulatory Meetings that take place twice a year management authorities receive 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. Since it cannot be conclusively stated that all parts of the management system are evaluated, SG 100 is not met.		
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 regular internal self-evaluation within the Norwegian bodies of governance. It is also subject to a number of mechanisms for 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. The Auditor General conducted comprehensive evaluations of the entire Norwegian system for fisheries management in 2003–2004 and in 2007–2008. 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.		
References		➢ Auditor General's Report No. 3:13 (2003–2004) on the Management of the Fish Resources ➢ Audito 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 ➢ Interviews with representatives of the Directorate of Fisheries during the site visit		

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**	
	➢ Report to the Storting No. 26 (2013–2014) On the Fishery Agreements that Norway has Concluded with Other States for 2014 and Fishery According to the Agreements in 2012 and 2013	
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Appendix 1.2 Conditions

As a standard condition of certification, the client shall develop an 'Action Plan' for meeting the conditions for continued certification. The conditions are associated with key areas of performance of the fishery, each of which addresses one or more Performance Indicators. Conditions, associated timescales and relevant Performance Indicators are set out below.

Condition 1:

Performance indicator	**P1.2.2** There are well defined and effective harvest control rules in place
SG80 guidepost(s) not met	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The selection of the harvest control rules takes into account the main uncertainties.
Score	65
Rationale	There are no well-defined harvest control rules (HCRs) in place which stipulate what management action will be invoked if the stock biomass declines to levels close to Btrigger or Blim, or if fishing mortality increases to levels close to Flim. The current implicit HCR does not take into account the main uncertainties underlying the assessment of stock status including any uncertainties in the estimation of discard rates.
Condition	By the fourth annual surveillance, well defined harvest control rules (HCRs) shall be implemented for the shrimp stock to ensure that the exploitation rates are reduced as limit reference points are approached. The HCRs should take into account the uncertainties underlying the assessment of stock status and the uncertainties in estimates of discard rates.
Annual milestones	**Annual surveillance 1**: Show written evidence of consultation with relevant authorities and stakeholder groups in relation to options for HCRs. **Annual surveillance 2:** Provide an evaluation of options considered for potential HCRs **Annual surveillance 3**: Propose HCR to relevant authorities **Annual surveillance 4**: Implementation of HCR through consultation with relevant authorities.
Suggested action	**Action 1.1** NFA will engage with the IMR and Ministry of Trade, Industry and Fisheries (hereby referred to as “the Ministry”) to evaluate the current status and progress towards implementing a HCR in the fishery. **Action 1.2** In year 2 NFA will provide an evaluation of options for potential HCRs **Action 1.3** In year 3 NFA will propose the HCR to relevant authorities. As the

	Danish and Swedish components of the fishery are also certified under the same condition, NFA will liaise with these counterparts in evaluating and proposing a HCR **Action 1.4** In year four, NFA will cooperate with stakeholders and management authorities and urge them to implement HCRs.

Condition 2:

Performance indicator	**PI 2.2.3** Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch.
SG80 guidepost(s) not met	Sufficient data continue to be collected to detect any increase in risk to main by-catch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).
Score	75
Rationale	Whilst there is a prohibition on discarding in Norway and therefore all bycatch species should be landed, discarding still occurs in the Norwegian shrimp fleet. Information on total catch composition from the Danish and Swedish vessels fishing in both the Skagerrak and Norwegian Deep provides an upper limit to the amount of bycatch species taken by the fishery in the trawls with grid and trawls with grid and tunnel, but there is a lack of information on the bycatch of small inshore vessels fishing within the 4nm baseline where a grid is not mandatory.
Condition	By the third annual surveillance, provide evidence of the level of discarding in inshore areas for vessels which do not use a grid, and implement appropriate measures to provide better evidence of the level of discarding.
Annual milestones	**Annual surveillance 1**: Provide evidence of the level of discarding in inshore areas for vessels which do not use a grid. **Annual surveillance 2:** Continue to provide evidence of the level of discarding in inshore areas for vessels which do not use a grid. Consider appropriate measures to provide better evidence of the level of discarding. **Annual surveillance 3:** Continue to provide evidence of the level of discarding in inshore areas for vessels which do not use a grid. Implement appropriate measures to provide better evidence of the level of discarding.
Suggested action	**Action 2.1** NFA will enter dialogue with IMR and the Directorate of Fisheries to summarize the current knowledge basis of discard levels in inshore areas, and determine what can be done to improve the data. **Action 2.2** Depending on the outcome of 2.1, NFA will in SA 2-3 propose taking the identified necessary steps to fill in any knowledge gaps concerning the level of discards for vessels that do not use a grid.

Condition 3:

Performance indicator	**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.
SG80 guidepost(s) not met	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
Score	75
Rationale	Whilst coral gardens are protected from potential damage by fishing gears in three Natura 2000 sites, some species of horn corals are found only in Bratten, and full protection for these corals is not yet in place in the Bratten. The main location of deep sea sponge aggregations in the Skagerrak is in the Bratten, and full protection from potential damage by fishing gear in the Bratten is not yet in place.
Condition	By the third annual surveillance, provide evidence that the shrimp fishery is highly unlikely to reduce coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm.
Annual milestones	**Annual surveillance 1**: Collate information for the assessment of risk that the shrimp fishery reduces coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm. Show written evidence of consultation with relevant authorities to identify mechanisms for reducing the risk if necessary. **Annual surveillance 2:** Provide evidence if necessary that the risk of impact of the shrimp fishery on coral gardens and deep sea sponge aggregations has been reduced. **Annual surveillance 3**: Provide evidence to demonstrate that the shrimp fishery is highly unlikely to reduce coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm.
Suggested action	**Action 3.1** NFA will liaise with the Directorate of Fisheries and Institute of Marine Research to assess the current data basis on the extent of potential harm to habitat structure in the area of operations. Through for example VMS analysis, it may be possible to quantify whether serious or irreversible harm is taking place. **Action 3.2** In the event that the evidence shows that serious or irreversible harm is taking place, NFA consult the IMR and the Directorate of Fisheries to determine what management measures can be taken to mitigate this. Cooperation with Swedish and Danish fisheries clients over regulations will also be sought. **Action 3.3** Depending on the outcome of 3.2, NFA will propose these measures, and seek to see them implemented within SA 4.

Condition 4:

Performance indicator	**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.
SG80 guidepost(s) not met	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.
Score	75
Rationale	Some elements of the partial strategy such as limitations on fishing effort and catch limits will work, but the lack of implementation of specific management measures to restrict fishing activity in many of the protected areas means that there is at present no objective basis for confidence that the partial strategy will work.
Condition	By the third annual surveillance, specific management measures which minimize the impact of fishing activities on habitat within all designated protected areas should be implemented if necessary to ensure that the shrimp fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
Annual milestones	**Annual surveillance 1**: Show written evidence of consultation with relevant authorities to consider specific management measures including area closures and move-on rules to restrict fishing activity within all protected areas. **Annual surveillance 2:** Propose specific management measures to restrict fishing activity in all protected areas to relevant authorities. **Annual surveillance 3**: Implementation of specific management measures to minimize the impact of fishing activities on habitat within all designated protected areas through consultation with relevant authorities.
Suggested action	**Action 4.1** NFA will liaise with the Directorate of Fisheries and Institute of Marine Research to assess the current data basis on the extent of potential harm to habitat structure in the area of operations. Through for example VMS analysis, it may be possible to quantify whether serious or irreversible harm is taking place. **Action 4.2** In the event that the evidence shows that serious or irreversible harm is taking place, NFA consult the IMR and the Directorate of Fisheries to determine what management measures can be taken to mitigate this. Cooperation with Swedish and Danish fisheries clients over regulations will also be sought. **Action 4.3** Depending on the outcome of 3.2, NFA will propose these measures, and seek to see them implemented within SA 4.

Condition 5:

Performance indicator	**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.
SG80 guidepost(s) not met	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).
Score	75
Rationale	Regulation J-40-2016 requires that "collisions" between fishing gear and corals and sponges (defined by 30 kg corals or 400 kg of sponges in a haul) must be reported and move-on rules apply. However in practice the use of sorting grids in the Norwegian shrimp fishery ensures that any large (>20mm) benthic bycatch will pass through the grids and will not be caught by the trawls. It is possible therefore that the encounter thresholds specified under J-40-2016 may never be reached even when the trawl is towed in areas with high abundance of corals and sponges or other VME habitats. Interactions between fishing gear and VME habitats may go unrecorded in areas where VME habitats have not been previously recorded unless there is a mechanism in place for recording such encounters in fishermen's log books. It was concluded that there are not sufficient data being collected to detect any increase in risk to the five VME habitats.
Condition	By the third annual surveillance, ensure that information on interactions of fishing operations with VME habitats is collected on a continuous basis.
Annual milestones	**Annual surveillance 1**: Develop and implement procedures for monitoring and recording all interactions with VME habitats in every fishing haul. Provide an analysis of collected data to determine whether significant impacts are likely. **Annual surveillance 2:** Continue to collect data on interactions between fishing operations and VME habitats and provide an analysis of collected data to determine whether significant impacts are likely. **Annual surveillance 3:** Continue to collect data on interactions between fishing operations and VME habitats, provide an analysis of collected data to determine whether significant impacts are likely, and provide evidence that procedures for monitoring, recording and analysing all interactions with VME habitats in every fishing haul have been fully implemented.
Suggested action	**Action 5.1** NFA will engage with IMR and the Directorate of Fisheries to evaluate practice and relevance of the J-40-2016 move-on rule in the southern component of prawn fisheries, as well as other data collection on habitat impacts. **Action 5.2** In year two, NFA will propose and implement necessary measures to improve data collection on interactions with sensitive habitats. **Action 5.3** In SA 3-4 NFA will provide analysis of collected data and determine whether significant impacts are likely. Potential action arising from this information is interlinked with actions pertaining to PI 2.4.1 and 2.4.2

Recommendation 1.

Performance indicator 1.2.1 There is a robust and precautionary harvest strategy in place

Score 80

Scoring issue b. The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.

Rationale. Whilst the current level of discarding is not hindering the harvest strategy from achieving its overall objective, and the discard rate is taken into account by ICES when providing TAC advice, the harvest strategy could be improved by reducing the discard rate of small shrimps. Measures currently being considered within the fishery include stronger 'move-on rules' or real-time closures when encountering areas of high densities of small shrimp, increases in the minimum landing size in Norway and improved selectivity of gear. A multi-agency project, the NORDEN project, is currently researching methods of reducing the catch of small shrimps. Initial results from the project are very encouraging; experimental fishing using a mesh size of 47mm instead of the standard 35 mm mesh shows a significant reduction in the capture of small shrimp, particularly in the "lus" (very small) category.

Recommendation The assessment team **recommends** the client to liaise with research scientists and gear technologists in the framework of the NORDEN project. This would better ensure that the project is carried out on a practical basis in a way that fishers could easily implement any desirable technical gear modifications to significantly reduce the capture of small shrimp. The clients could also offer assistance with gear trials on their vessels.

Recommendation 2.

Performance indicator 1.2.4. There is an adequate assessment of the stock status

Score 90

Scoring issue d. The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.

Rationale. An alternative newly-implemented stochastic length-based assessment model has also been applied to this fishery, but the model still requires some further development. The length-based model and the surplus production model provide similar estimates of stock biomass but, in some years, significantly different estimates of fishing mortality.

Recommendation. The assessment team **recommends** that further research is undertaken to resolve the differences in fishing mortality generated by the length-based and surplus production assessment models.

Recommendation 3.

Performance indicator 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**.**

Score 80

Scoring issue a. 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.

Rationale. The use of the sorting grid is not mandatory within 4nm of the coastline, and even though many Norwegian vessels use a grid when fishing both inside and outside the 4 nm limit, the assessment team concluded that there is not a strategy in place for managing all retained species.

Recommendation. The assessment team **recommends** that the use of a sorting grid should be mandatory within the 4 nm limit.

Recommendation 4.

Performance indicator 2.3.3. Relevant information is collected to support the management of fishery impacts on ETP species

Score 80

Scoring issue c. Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.

Rationale. The recording on log books of the capture of any ETP species, in conjunction with the prohibition of discarding of any species including ETP species, should provide sufficient information to measure trends and support a full strategy to manage impacts on ETP species. However during the site visit the assessment team received some anecdotal information that some ETP species may be captured and discarded without being recorded on log books.

Recommendation. The assessment team **recommends** therefore that systems are put in place to ensure that all ETP species are recorded on log books irrespective of whether they are landed or discarded and that the captures of all ETP species are mapped.

Appendix 1.3 Client Action Plan

Appendix 1.3.1 Client Action Plan – Norges Fiskarlag

NORGES FISKARLAG
FISKARLAGETS SERVICEKONTOR AS

DNV GL

Vår dato	*Vår referanse*	*Vår saksbehandler*	*Deres referanse*
19.01.2016	2016/00026-1	Tor Bjørklund Larsen/	

Client Action Plan for meeting the reassessment certification conditions:
Full assessment: Norway Skagerrak and Norwegian Deep cold water prawn fishery

The Norwegian Fisherman's Association (NFA) submits this action plan for meeting the conditions for the full assessment of the Norway Skagerrak and Norwegian Deep cold water prawn fishery.
NFA agrees to make a good faith effort to meet the intent of the conditions set forth by the conformity assessment body DNV GL in December 2015 in the client review draft report. This report determines that, with four conditions, the fishery is sustainable and well-managed in accordance with the MSC principles and criteria for sustainable fisheries.

The Norwegian Seafood Industry has set up a permanent formal advisory committee working with environmental and eco-labelling issues, reporting to the boards of NFA, the fisherman's sales organizations, the Norwegian Seafood Export Council and the Norwegian Seafood Federation. The Norwegian Ministry of Trade, Industry and Fisheries is a permanent observer to the group. This ensures that all certification decisions, including this action plan, are supported and accepted among all the parties involved directly or indirectly in the fisheries.

In the following sections we will address each of the conditions individually in the table format laid out by the CAB.

Condition 1

NFA action plan	**Action 1.1** NFA will engage with the IMR and Ministry of Trade, Industry and Fisheries (hereby referred to as "the Ministry") to evaluate the current status and progress towards implementing a HCR in the fishery. **Action 1.2** In year 2 NFA will provide an evaluation of options for potential HCRs **Action 1.3** In year 3 NFA will propose the HCR to relevant authorities. As the Danish and Swedish components of the fishery are also certified under the same condition, NFA will liaise with these counterparts in evaluating and proposing a HCR **Action 1.4** In year four, NFA will cooperate with stakeholders and management authorities and urge them to implement HCRs.
Consultation on condition	Ministry of Trade, Industry and Fisheries Institute of Marine Research

Condition 2

NFA action plan	**Action 2.1** NFA will enter dialogue with IMR and the Directorate of Fisheries to summarize the current knowledge basis of discard levels in inshore areas, and determine what can be done to improve the data. **Action 2.2** Depending on the outcome of 2.1, NFA will in SA 2-3 propose taking the identified necessary steps to fill in any knowledge gaps concerning the level of discards for vessels that do not use a grid.
Consultation on condition	Directorate of fisheries Institute of Marine Research

Condition 3

NFA action plan	**Action 3.1** NFA will liaise with the Directorate of Fisheries and Institute of Marine Research to assess the current data basis on the extent of potential harm to habitat structure in the area of operations. Through for example VMS analysis, it may be possible to quantify whether serious or irreversible harm is taking place. **Action 3.2** In the event that the evidence shows that serious or irreversible harm is taking place, NFA consult the IMR and the Directorate of Fisheries to determine what management measures can be taken to mitigate this. Cooperation with Swedish and Danish fisheries clients over regulations will also be sought. **Action 3.3** Depending on the outcome of 3.2, NFA will propose these measures, and seek to see them implemented within SA 4.
Consultation on condition	Institute of Marine Research Directorate of Fisheries

Condition 4

NFA action plan	**Action 4.1** NFA will liaise with the Directorate of Fisheries and Institute of Marine Research to assess the current data basis on the extent of potential harm to habitat structure in the area of operations. Through for example VMS analysis, it may be possible to quantify whether serious or irreversible harm is taking place. **Action 4.2** In the event that the evidence shows that serious or irreversible harm is taking place, NFA consult the IMR and the Directorate of Fisheries to determine what management measures can be taken to mitigate this. Cooperation with Swedish and Danish fisheries clients over regulations will also be sought. **Action 4.3** Depending on the outcome of 3.2, NFA will propose these measures, and seek to see them implemented within SA 4.
Consultation on condition	Directorate of Fisheries Institute of Marine Research Ministry of Trade, Industry and Fisheries

Condition 5

NFA action plan	**Action 5.1** NFA will engage with IMR and the Directorate of Fisheries to evaluate practice and relevance of the J-40-2016 move-on rule in the southern component of prawn fisheries, as well as other data collection on habitat impacts. **Action 5.2** In year two, NFA will propose and implement necessary measures to improve data collection on interactions with sensitive habitats. **Action 5.3** In SA 3-4 NFA will provide analysis of collected data and determine whether significant impacts are likely. Potential action arising from this information is interlinked with actions pertaining to PI 2.4.1 and 2.4.2
Consultation on condition	Institute of Marine Research Directorate of Fisheries

NORGES FISKARLAG

Tor Bjørkhaug Larsen

Kopi til:
Vedlegg:

Appendix 1.3.2 Supporting documents from IMR, Directorate of Fisheries and the Ministry of Trade, Industry and Fisheries

- **Condition 1**: See Ministry of Trade, Industry and Fisheries – email dated 8 February 2016, and Directorate of Fisheries – letter dated 28 January 2016
- **Condition 2**: see IMR – letter dated 29 January 2016
- **Conditions 3, 4 and 5:** See Directorate of Fisheries – letter dated 28 January 2016 and IMR (29 January 2016)

INSTITUTE OF MARINE RESEARCH
HAVFORSKNINGSINSTITUTTET

Norges Fiskarlag
tor@fiskarlaget.no

Your ref: Our ref: 2016/117 Bergen 29.01.2016
Archive No.:
Serial No.:

"SUPPORTING LETTER" CLIENT ACTION PLAN

We are referring to the request by the Norwegian Fishermens's organization dated 19. January 2016, to provide consultation on the client action plan to meet the reassessment certification conditions of the Norway Skagerrak and Norwegian Deep cold water prawn fishery.

The IMR has read the client comments and actions for the conditions relating to harvest control rules, by-catch and habitat functioning and structure. The IMR is willing to take part in dialogue about these issues as detailed in the Client Action Plan.

Yours sincerely,

Geir Huse
Research Director

Institute of Marine Research
P O Box 1870 Nordnes, NO-5817 Bergen
Tel.: +47 55 23 85 00
Fax: +47 55 23 85 31
E-mail: post@imr.no

Dept: Økosystem og ressurser
Handled by: Geir Huse
Tel: +47 55 23 68 88
E-mail: geir.huse@imr.no
Visits: Nordnesgaten 33

Org.no: NO 971 349 577
Bank: 7694.05.00849
Swiftaddr: DNBANOKK
IBAN: NO74 7694 0500 849
www.imr.no

Directorate of Fisheries

FISKERIDIREKTORATET

Norges Fiskarlag
Postboks 1233 Sluppen

7462 TRONDHEIM

Saksbehandler:	Modulf Overvik
Telefon:	46804147
Seksjon:	Utviklingsseksjonen
Vår referanse:	12/1254
Deres referanse:	
Vår dato:	28.01.2016
Deres dato:	

Att:

STAKEHOLDER PARTICIPATION IN NORWEGIAN FISHERY MANAGEMENT

The Directorate of Fisheries are regularly consulting The Norwegian Fishermen's Association (NFA) as a hearing and discussion partner on fishery regulatory issues. According to the Marine Resources Act (MRA), this is, among other things, both an obligation and a responsibility for The Directorate of Fisheries to ensure a sustainable and economically profitable management of wild living marine resources and genetic material derived from them in cooperation with stakeholders. Concerning the shrimp fishery in Skagerrak, a draft management strategy was submitted by Norway to ICES in mid 2015. The ICES has however not been able to finalize its evaluation of the proposal, but a response is anticipated in 2016.

Within the framework of the MRA, the Directorate of Fisheries is also obliged to engage actively in exploring ways to reduce impact on habitat structures exposed to various fisheries activities, including the shrimp fishery in Skagerrak, where we will continue our cooperation with NFA as a stakeholder.

Med hilsen

Anne Kjos Veim
seksjonssjef

Modulf Overvik
rådgiver

Brevet er godkjent elektronisk og sendes uten underskrift

Postadresse: Postboks 185 - Sentrum 5804 BERGEN **Besøksadresse:** Strandgaten 229 **Telefon:** 03495 **Telefaks:** 55238090
Organisasjonsnr: 971 203 420 **E-postadresse:** postmottak@fiskeridir.no **Internett:** www.fiskeridir.no

Ministry of Trade, Industry and Fisheries

Fra: Bernt.Bertelsen@nfd.dep.no [mailto:Bernt.Bertelsen@nfd.dep.no]
Sendt: 8. februar 2016 14:40
Til: Tor Bjørklund Larsen
Kopi: Astrid.Holtan@nfd.dep.no; Elisabeth-Norgard.Gabrielsen@nfd.dep.no
Emne: SV: "Supporting letter" Client action plan

Hei Tor,

Vi kan bidra med følgende tilbakemelding herfra:

Fiskerimyndighetene bestreber seg alltid på å forvalte fiskeressursene slik at høstingen er bærekraftig og lønnsom, jf. formålet i havressursloven. For å oppnå dette innhenter forvaltningen et best mulig kunnskapsgrunnlag og kunnskapsbaserte råd fra forskningen (oftest Havforskningsinstituttet og ICES), og for selve utøvelsen og reguleringen av fisket gjennomføres det regelmessige høringer. I tillegg avholdes det møter med ulike organisasjoner og aktører vedrørende ulike problemstillinger, eksempelvis gjennom arbeidsgrupper hvor utfordringer og reguleringer i bestemte fiskerier kan være tema.

Norges Fiskarlag sine innspill og forslag til tiltak vil i slikt arbeid være viktige. Når det gjelder forvaltningen av reker i sør kan vi for øvrig bemerke at reguleringene er betydelig skjerpet de siste årene, og at Fiskeridirektoratet er involvert i arbeidet med å utvikle teknologi som kan gjøre fisket mer selektivt. Samtidig er bestandssituasjonen god. For øvrig kan vi bemerke dette oppslaget fra i fjor høst: http://www.nrk.no/ostfold/innforer-nye-restriksjoner-for-rekefisket-1.12606999

CAB Translation:

Fisheries authorities strive always to manage fish resources so that harvesting is sustainable and profitable, ref. The purpose of the Marine Resources Act. To achieve this the authorities obtains the best possible knowledge base and knowledge-based advice from the research (mostly IMR and ICES), and for the operation and regulation of fishing activities there are conducted regular hearings. In addition, it is held meetings with various organizations and actors regarding various issues, for example through workshops where challenges and regulations in specific fisheries can be themed.

Norwegian Fishermen's Association´s input and proposed measures will in such work be important. Regarding the management of shrimp in the south, we can further note that regulations have increased significantly in recent years, and the Directorate of Fisheries is involved in efforts to develop technology that can make fishing more selective. Meanwhile, the population situation good. Otherwise we can remark this posting from last fall:
http://www.nrk.no/ostfold/innforer-nye-restriksjoner-for-rekefisket-1.12606999

Mvh

Bernt Bertelsen

seniorrådgiver
Fiskeri- og havbruksavdelingen

Nærings- og fiskeridepartementet
Postboks 8090 Dep
0032 Oslo

Tlf: 22246493/93437000
E-post bbe@nfd.dep.no
www.regjeringen.no/nfd
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APPENDIX 2. PEER REVIEW REPORTS

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: The fishery is on a well managed stock exploited at sustainable levels. The conditions set on a lack of an established management plan, issues with documentation of the by-catch and documentation of the habitat impacts are justified.		No further comment required

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	Yes	Conformity Assessment Body Response
Fulfilling the conditions partly rely on the introduction of legislation or actions of government institutions which the Client cannot control. The Client can only either as an entity or through industry organisations of which the Client is a member urge the competent authorities to develop and implement regulations and change priorities at the government institutions. This is appropriately reflected in the Client Action plan. **Condition 1**: May be fulfilled though the adoption of a management plan at the level of the EU_Norway level, the Norwegian Government level but might also be developed at Client level. The Action Plan implies that the HCR should be developed at Government level which is beyond the full control of the Client. The Client Action Plan is aware that similar conditions are set for the Danish and Swedish cold water prawn fisheries in Skagerrak and Norwegian Deep and that cooperation between the Parties may facilitate meeting the condition. **Condition 2**: PI 2.1 and PI 2.2 scorings rely heavily on the conjecture that there are discards in the Norwegian fishery although the fishery operates under a legal discard ban. This is surmised in spite of the generally high compliance with regulations in Norwegian fisheries (PI 3.2.3). Even so, expert involved with the fishery seems to be in agreement that discards occur but also that no hard evidence is presented. p. 14 in the present assessment report concludes "discarded shrimp are assumed to be primarily shrimp under 15 mm CL and are estimated from length distributions of the catch." …."there is some uncertainty surrounding the estimate of discard rate in the Norwegian fleet (NAFO/ICES, 2015; Munch-Petersen et al., 2013; Søvik and Thangstad, 2014b)." …. In addition, the Norwegian Ministry of Industry and Fisheries introduced new legislation in 2015 to implement real time closures (RTCs) in areas where the catch rates of small shrimps is high and has increased the minimum landing size to 7 cm total length. ICES (2015) Advice 2015 section 6.3.17 concludes "Discarding practices in the Norwegian fishery are unknown, and Norwegian discards have been estimated by applying the Danish discard ratio to Norwegian data." The Assessment team reflects that (PI 3.2.3 (d) that 'there is less reason to expect high grading to occur in the Norwegian than, e.g. the Swedish shrimp fishery ….". Condition 2 is appropriately focused on clarifying if this discard occurs or not. **Condition 3**: No comment, this seems appropriate **Condition 4**: No comment, this seems appropriate		No further comment required

Do you think the client action plan is sufficient to close the conditions raised?	Yes	Conformity Assessment Body Response
Justification: The actions proposed for each of the four conditions to be as planned will lead to that the PI's are scored within the responsibilities of Norsk Fiskarlag and if completed at SG80 or higher.		No further comment required

General Comments on the Assessment Report

Harmonization with the corresponding Danish and Swedish fisheries is well demonstrated.

Performance Indicator Review

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
Principle 1 Target Species					
1.1.1	Yes	Yes	N/A	Neither of the two assessment models are quite satisfactory and hence there is not a high degree of certainty of stock status	No further comment required
1.1.2	Yes	Yes	N/A		
1.1.3	Yes	Yes	N/A	The stock is well above B_{MSY}.	No further comment required
1.2.1	Yes	Yes	N/A		
1.2.2	Yes	Yes	Yes Condition 1	There is no HCR and the condition requires that this be remedied	No further comment required
1.2.3	Yes	Yes	N/A	Regular Abundance Survey and fisheries information available sales,logbooks, and VMS for larger vessels	No further comment required

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
1.2.4	Yes	Yes	N/A		
Principle 2 Ecosystem Effects					
2.1.1	Yes	Yes	N/A		
2.1.2	Yes	Yes	N/A	The lack of grid usage inside 4nm may weaken this conclusion (SG 100c). However, a high score (95) will be justified	The assessment team accepts the peer reviewer's concern that the lack of grid usage inside 4nm weakens the rationale for the SG100c and this scoring issue has been rescored at 80. The overall score for this PI has been reduced therefore from 100 to 95.
2.1.3	Yes	Yes?	N/A	a) The argument that SG100 is not met is speculative, 'discard may occur'. Is there stronger evidence that discard occurs? b) SG100 fail; discard c) Agree d) SG 100 fail; discard The discussion presented above on the basis for the assumption that high	Additional text has been added to the rationale noting that the authorities and stakeholders all acknowledge that discarding of retained species may take place, but the the level of discarding has not been quantified. The score remains at 80.

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
				grading occurs justify the scoring and the condition	
2.2.1	Yes	Yes	N/A		
2.2.2	Yes	Yes	N/A	a) Agree b) The sentence that the 'catch level have not exceeded the ICES advice' seems true but is it relevant here? Which are the implications c) Agree d) Agree	The assessment team considered that the control of exploitation rate through individual vessel quotas and an overalll TAC for the Norwegian fleet are important components of the strategy for controlling the level of bycatch. The fact that total catches have not exceeded the TAC in recent years provides evidence that those elements of the strategy are indeed working.
2.2.3	Yes	Yes	Yes Condition 2	As stated, it is the discard argument which is behind this scoring. If there is no discard there is no need for an observer programme vis-a-vis catch composition Sampling intensity is low and data are grouped, the condition is justified. Yet an argument to sort out if	No further comment required

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
				discards occur	
2.3.1	Yes	Yes	N/A		
2.3.2	Yes	Yes	N/A		
2.3.3	Yes	Yes	N/A		
2.4.1	Yes	Yes	Yes Condition 3	The better information seems to come from the logbooks Figure 15 and I assume that VMS data support these maps; the scoring and condition that the fishery should justify that coral reefs and deep sea sponge are not being reduced by the fishery seems justified	VMS data support the information on fishing positions recorded in log books.
2.4.2	Yrs	Yes	Yes Condition 4	The condition calls for management measures that minimize fishing impact on habitats in protected areas. This seems justified by the documentation.	No further comment required

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
2.4.3	Yes	Yes	N/A		
2.5.1				The reference under a) to the EU MSFD is not relevant here rather the Norwegian Management Plan for Skagerrak and North Sea. However the remaining text justify the scoring	The assessment team assumes that this comment relates to PI 2.5.2 and not PI 2.5.1. The reference to the EU MSFD does have some relevance here as the Norwegian management plan was developed in part as a response to MSFD as well as other international environmental targets. The text has been re-ordered, however, to place less emphasis on the EU MSFD.
2.5.2	Yes	Yes	N/A		
2.5.3	Yes	Yes	N/A		
Principle 3 Management					

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
3.1.1	Yes	Yes	N/A	The reference to the EU-Norway Framework agreement is the EU implementation of the agreement, the Framework agreement is published as No L 226/48 in the Official Journal of the European Communities 29.8.1980, actually it would be polite to refer to the Norwegian government, see https://www.regjeringen.no/no/tema/mat-fiske-og-landbruk/fiske-og-havbruk/rydde-internasjonalt/fiskerisamarbeidet-med-eu/id437333/	The framework agreement itself is actually not available on the website, but we have added the reference as the Norway–EU cooperation is presented on the website, and the annual quota agreements and other relevant news are found there.
3.1.2	Yes	Yes	N/A		
3.1.3	Yes	Yes	N/A		
3.1.4	Yes	Yes	N/A		
3.2.1	Yes	Yes	N/A		
3.2.2	Yes	Yes	N/A		

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
3.2.3	Yes	Yes	N/A		
3.2.4	Yes	Yes	N/A	Justification 3.2.4 a) 2nd paragraph refers to DTU Aqua and Denmark and should be replaced by a text that refers to IMR and Norway b) DTU Aqua does not publish IMR's research plans	Amended.
3.2.5	Yes	Yes	N/A		

Any Other Comments

Comments	Conformity Assessment Body Response
There are a few minor comments that the team might reflect upon 1. Species name in Table 11 *Pasiphea multidentata* is misspelled for *Pasiphaea multidentata*. 2. Table 15 'Consultation during assessment process' last entry seems to be a misprint probably the date should be 30 June not 3 June 3. For Appendix 1 PI 1.1.2 remove the guiding text in the justification text (b),	1. The spelling error has been corrected. 2. The correct date has now been inserted in Table 15. 3. The assessment assumes that this comment relates in fact to PI 1.1.3. The guiding text has now been removed and replaced with "N/A". 4. The spelling error has been corrected throughout the report.

(c), References. 4. Figure 19, Page 134 line 2(from top) PI 2.4.1 and 2.4.2 ‘Gullma**R**sfjorden’ ‘R’ missing. This occurs in total at 5 places in the text	

Peer Reviewer 2

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: Although there some areas in which the scoring is not entirely clear (most notably in P2) overall the evidence presented supports the eventual conclusions.		No further comment required

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**Yes**	**Conformity Assessment Body Response**
Justification: Overall yes, although there are some points at which the requirements do not strictly align with the relevant SG80 guideposts. Also, some conditions may have unnecessarily short timeframes.		See comments under individual PIs.

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**Yes**	**Conformity Assessment Body Response**
Justification: The client action plans seem to address the conditions very well. The commitment from other agencies in achieving these goals (notably DoF) seems slightly ambivalent, but experience from other Norwegian fisheries suggests strong engagement when it matters. Overall then, the CAP is considered sufficient.		No further comment required

General Comments on the Assessment Report (optional)

This fishery is very similar to the equivalent Danish fishery which this reviewer reviewed in late 2015. The comments made then (where relevant) have largely been considered in this assessment, which is appreciated. Accordingly, there are fewer general comments to be made.

It is noted that the assessment began in March 2015 and so the arrangement for a TED 6 months prior to certification is understood. The reason for a TED of 1 November is not clear, however.

The only overarching comment is therefore that better information on retained species and bycatch species should be presented, even if this is only replicated from the Danish fishery.

CAB response:

Fishing is all year around. In order to allow the client to take advantage of the opportunity to set the TED up to a maximum 6 months prior to the publication of the Public Comment Draft Report, the TED is set to 1 November 2015.

Additional information has been provided both in the background information and the scoring rationales for retained (2.1.1) and bycatch (2.2.1) species.

:

Performance Indicator Review

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	Y	Y	na	The additional information on the length based model outputs are treated in a suitably precautionary manner	No further comment required
1.1.2	Y	N	na	The scoring is probably correct, but the MSC default LRP is 0.5Bmsy. This is Btrigger but greater than Blim. The scoring commentary should confirm which is used as the limit reference point in a management situation, or why this Blim is acceptable.	The assessment team notes that the MSC default LRP is 0.5Bmsy or 20%Bo, but also that "for some short-lived stocks the actual point at which there is an appreciable risk that recruitment is impaired may be lower than 20%Bo…". The NAFO/ICES Pandalus assessment group (NIPAG) considers that 0.3Bmsy is an appropriate Blim for *Pandalus borealis* stocks assessed using a production model, although in practice, ICES management advice for this stock takes into account stock status in relation to both Blim (0.3 Bmsy) and Btrigger (0.5Bmsy). The rationale for PI 1.1.1 on stock status relative to reference points acknowledges that management takes into account more than one limit reference point.

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
1.1.3	Na	Na			
1.2.1	Y	Y	na	Question: is the detail of the CFP relevant here? Comment: the issue of discarding is indeed a concern, but this has been recognised and evaluated in what appears an appropriate manner. The new regulations on MLS and closed aeas are a welcome development, but may be more appropriate to SIa than SIb.	The harvest strategy for the shrimp stock in the Skagerrak and Norwegian Deep is underpinned primarily by annual agreements between the EU and Norway on the regulation of fisheries in the North Sea and the Skagerrak and Kattegat, but as the stock is exploited by many EU countries, a brief mention of the CFP seems relevant here. The issue of discarding could have been discussed under either SIa or SIb, but on balance the assessment team considered it was more appropriate to consider under SIb.

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
1.2.2	Y	Y	Yes	A comment was raised in relation to this PI for the Danish fishery. The team have now clarified this issue. The condition seems appropriate, although the comments for PI 1.1.2 are also relevant here – is Btrigger the *de facto* LRP?	ICES management advice for this stock for 2015 states that "The stock biomass has been above MSY Btrigger and fishing mortality below FMSY since the start of the assessment". Although the assessment takes into account stock status in relation to both Blim (0.3 Bmsy) and Btrigger (0.5Bmsy), Btrigger is therefore the *de facto* LRP. In practice the HCR requires that the TAC is set at a level which ensures that fishing mortality does not exceed Fmsy and that stock biomass remains above Bmsy.

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
1.2.3	Y	Probably	na	For SIa, the scoring is consistent with requirements, although the level of discarding is an issue in this (Norwegian) fishery and has only been extrapolated through comparison with Danish vessels. The information available meets SG80 and is certainly comprehensive (As required at SG100), but the uncertainty around such an important element is an obvious concern. Treatment of this issue in SIb, however, does seem to addresses this. Clarification would be helpful here.	The assesment team agrees with the peer reviewer that information is comprehensive across the whole fleet and therefore meets the SG100a. There is some uncertainty around the estimates of discard rates in the Norwegian component of the fleet and this uncertainty is one of the reasons that the assessment team concluded that the SG100 is not met for scoring issue b.
1.2.4	Y	Y	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	N	Y	na	Several retained and bycatch species are listed in Table 16, but without any data on catches (or comparable data from Danish fishery). While the score is not expected to change, some relevant data should be provided to support the conclusion reached. Comment: some Norwegian vessels have no grid, it seems reasonable to assume that catches will be equivalent, but this should be confirmed – see comments under PI 2.2.2?	Landings data for *Pandalus borealis* and other retained species from Pandalus trawls in both the Skagerrak and Norwegian Deep from 2012-2014 were provided by the Norwegian Directorate of Fisheries and are presented in Table 7 of the report. These retained species are the same as those listed in Table 16. As noted throughout the report, there are no data on total catch compositions for the Norwegian vessels, so the standard MSC method of identifying "main" retained species cannot be used. However based on the species composition of the landings from Pandalus trawls in the Norwegian fishery in the Skagerrak and Norwegian Deep (Table 7), and the analysis of total catch composition from the Danish and Swedish fisheries in the same area, the assessment team concluded that saithe and cod could be considered as main retained species in the Norwegian shrimp fishery. There are some total catch composition data for the standard trawl without a grid from the Swedish observer programme (but not since 2012) which show that cod and saithe are the only main retained speceis when no grid is used. The rationale has been modified accordingly.

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
2.1.2	N	Y	na	Mandatory use of the sorting grid is mentioned, but this is not mandatory for all Norwegian vessels (e.g. SId). This should be clarified to fully justfy the score.	The assessment team notes the peer reviewer's comment that the sorting grid is not mandatory in all areas, a comment made also by the other peer reviewer. On reflection, the assessment team considers that SG100c is not fully met and this scoring issue has been rescored at 80. The overall score for this PI has been reduced therefore from 100 to 95.
2.1.3	Y	Y	na		
2.2.1	N	Y	na	Again, no main bycatch species are identified (which is probably correct), but without evidence to support this.	The rationale has been amended to include additional evidence to justify the scoring. The score for this PI remains at 80.

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
2.2.2	Y but see comments	Y	na	The scoring here seems appropriate, although the team do seem to treat the issue of sorting grids differently in different PIs. The conclusion here is that they are mostly used but this is not mandatory – this seems the correct interpretation and should be used throughout (e.g. 2.1.1, 2.1.2). The question then is whether or not the effects of vessels not using the grid materially affects the outcome for the fleet as a whole.	The assessment team accepts the comment that the issue of sorting grids had been treated differently across the PIs. Sorting grids are used on most vessels but are not mandatory within the 4nm limit of the Norwegian coastline. A comparable approach to the issue of sorting grids has now been applied across PIs and rationales have been revised accordingly.

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
2.2.3	N	Probably	N	(1) There is an obvious lack of 'some quantitative' information for 'the fishery'. Extrapolation from Danish vessels provides an indication of bycatches, but is there qualitative information of comparability? (2) For the Danish fishery, I raised a question on this PI: "*For SId, the question seems to be whether the existing level of information collection (which meets SG80 for SI a-c) is ongoing or not. If it is to continue at current levels, then SG80 should presumably be met - or the other SIs are not currently met*?" The team provided a reasoned basis for the scoring, which makes sense, but is not repeated here. The rationale would be much clearer if it were. (3) The condition seems to be required for all vessels, not only those that do not use a grid? Also, the two-year milestone may be unnecessarily restrictive – four years are allowed, and may be required.	(1) Additional information has been added to the scoring rationale. (2) The peer reviewer queried whether the existing level of information collection is to continue at current levels. The assessment team noted that whilst the existing level of information from the Danish and Swedish observer programmes was sufficient to meet the SG80 for SIa-c, it was not possible to evaluate whether there are any main bycatch species for the small proportion of total fishing trips which are conducted within 4nm of the Norwegian coastline using a trawl without a grid. It would therefore be difficult to detect any increase in risk to bycatch species (SId) **if the operation of the fishery should change,** i.e. if the relative use of the different types of fishing gear should change. The assessment confirms the score for this PI. (3) The condition has been modified to cover only those vessels that do not use a grid, and the timeline extended to three years.

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
2.3.1	Y	N	na	For SIc, the question would be whether indirect effects have been considered by management (relevant to scoring), or only by the assessment team (not relevant, presumably).	The rationale has been modified to clarify that meetings during the site visit with the Norwegian Directorate of Fisheries and Norwegian Ministry of Industry, Trade and Fisheries confirmed that management authorities had considered that indirect effects are thought to be unlikely to create unacceptable impacts on ETP species.
2.3.2	Y	Y	na		
2.3.3	Y	Y	na	The recommendation is fully supported by this reviewer.	No further comment required

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	Y	N	Y	The scoring seems appropriate, especially given the difficulty in determining a probability of a serious impact. The rationale should probbaly positively determine that SG60 is met, however. The consideration of only sensitive habitat elements could (although not in this case) skew the scoring a little – sand and mud would be expected to recover quite well. The condition presupposes impact ('serious harm') rather than requiring an evaluation of whether this is taking place. The action plan is actually more appropriate.	The rationale has been amended to confirm that the SG60 is met for coral gardens and deep sea sponges. The conditions and milestones have been revised so that impact is not pre-supposed.

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
2.4.2	Y	Y	Y (but see comments)	The condition asks for impacts to be minimised, which is not what the SG80 requirement asks – management should be appropriate to achieve PI 2.4.1 SG80 level of performance. Again, the action plan seems more appropriate. It is assumed that a 4-year timescale has been considered and discounted?	The condition has been revised to ensure that management is appropriate to achieve the Habitat Outcome 80 level of performance. A 4-year timeline had been considered during previous assessments of the Swedish and Danish fisheries, but following discussions between stakeholders and the clients, it was agreed that a 3-year timescale was appropriate and achievable. The same 3-year timeline is attached therefore to the condition for the Norwegian fishery.
2.4.3	Y	Y	na		
2.5.1	Y	Y	na	Comments made on the Danish fishery have been well treated here. Much appreciated.	No further comment required
2.5.2	Y	Y	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
2.5.3	Y	Y	na		
3.1.1	Y	Y	na	Responses to comments made on the Danish fishery are noted.	
3.1.2	Y	Y	na		
3.1.3	Y	Y	na		
3.1.4	Y	Y	na		
3.2.1	Y	Y	na		
3.2.2	Y	Y	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
3.2.3	Y	Y	na	The most likely problem here was expected to be the potential for discarding/high grading, which appears to be an issue with the fishery. This arises for SIc and is relevant to compliance, and the provision of information on 'catches and discards' (CB4.9.1). The question is whether there is 'some evidence' of compliance, and this is indeed presented in SIb. The scoring therefore may be considered generous, but is within the bounds of the justification provided.	No change in the report is required.
3.2.4	N	N	na	Justification should be provided for Norway, not Denmark.	Amended.
3.2.5	Y	Y	na		

APPENDIX 3. STAKEHOLDER SUBMISSIONS

No written submissions were made by stakeholders during consultation opportunities on:
- The announcement of full assessment
- Proposed team membership
- Proposed peer reviewers
- Proposed assessment tree

Appendix 3.1 Comments during/after the period of site-visit

One stakeholder, WWF Norway, submitted comments on the assessment team´s request short after the site visit. The e-mail with the comments and the responses of the assessment team are shown below. Appendix 6 and 7 include the documents attached in the e-mail from WWF.

From: Fredrik Myhre [mailto:fmyhre@wwf.no]
Sent: 16 June 2015 14:10
To: Julian Addison
Subject: SV: MSC certification assessment of Norwegian shrimp fishery in Skagerrak and North Sea

Dear Julian.

Thank you very much for the meeting at the 27th of May.
We are really looking forward to the further process.

As ICES tells you, there is no data for discards in the Norwegian shrimp fishery. Their estimates are related to the data from the Danish and the Swedish fisheries, and then calculated to “fit” the Norwegian fishery. That being said – both the Directorate of Fisheries and the Norwegian Coast Guard are stating that all shrimps under 7 cm are being discarded back to sea – and the industry do not question this statement in a high degree (these discard numbers however may not be reflected in the numbers from the ICES).
This discard especially goes for both the Norwegian and the Swedish shrimp fisheries.

The discard problems are relevant for both off-shore and in-shore fishing vessels. The Norwegian Coast Guard are telling us that when they are doing random inspections in areas where vessels are reporting no undersized shrimps, they often find a lot of undersized shrimps in the catches.
The Coast Guard states: “There is an attitude problem in the Norwegian shrimp fishery”.

CAB response:
During the site visit, the assessment team was informed by both management authorities and stakeholders that discarding of small shrimps and other bycatch species is occurring within the Norwegian shrimp fishery. In addition the assessment team recognised that there was significant uncertainty surrounding the estimates of the level of discards and this is reflected in the Public Comment Draft Report. Whilst this level of discarding is not considered to be hindering the harvest strategy from achieving its overall objective, and the discard rate is taken into account by ICES when providing TAC advice, the assessment team made a **recommendation** that the harvest strategy could be improved by reducing the discard rate of small shrimps.

The specific problem with in-shore shrimp fishing practice (within 4 nautical mile) is that there is no sorting grid in place in order to sort out fish. Especially endangered coastal cod and spiny dogfish can be caught by fishermen along the coast line (ETP species).
A report from the Institute of Marine Research from 2008 states that in order to help out rebuilding an endangered costal cod stock, there is a need for mandatory sorting grid in the shrimp fishery – also within the 4 nautical mile zone.

CAB response:
The assessment team recognised that there may be significant bycatches within the 4nm limit of the Norwegian coast where the use of a sorting grid is not mandatory. A **condition** was raised to ensure that information on total catch compositions from this inshore area are evaluated to determine whether there are significant bycatches in the trawls without a grid.

WWF-Norway supports the strategy document now launched by the Directorate of Fisheries (attached a English translated version) and we feel that these recommendations (listed below – and in attached document) are a minimum in order to get the shrimp fishery MSC certified.
Strategy for improvement of the management of the shrimp fishery in the North Sea and Skagerrak.

1. *Extending the RTC regime to also apply for shrimp. Allow shrimp fishing to continue in closed areas, provided that selective devices are used. Consider adjusting the current minimum of 6 cm up to the commercial minimum size of about 7 cm. Alternatively, the commercial minimum size could be assumed as a closing criterion.*
2. *Evaluate the exception of the landing obligation, cf. Regulations relating to the exercise of fishing in the lake § 48, for bycatches of Norway pout and blue whiting in the shrimp fisheries, and clarify the term shrimp to only include Pandalus borealis, in order to limit the discard ban to this.*
3. *Working on the development of selection systems to sort out small shrimp.*
4. *Extending the scope of mandatory use of sorting grids to also include those within 4 nautical miles of the baselines south of 62 °N. Consider possible exceptions to the general obligation to possibly use "crayfish hole" (to minimize any loss of crayfish) in shrimp fisheries in certain areas within the 4 nautical miles limit, as well as any other exemption rules for use of the grid.*
5. *Develop management plan in cooperation with the EU.*

Items 1-4 are a purely Norwegian venture, whereas item 5 is a joint project with the EU.

FYI – **The Directorate of Fisheries also gave specific advice to the Ministry of Trade, Industry and Fisheries at the Regulation Meeting in Bergen the 4th of June (attached – Norwegian only)**
These advice is now being processed in the Ministry politically and we are awaiting the final result. Please note that in order for the RTC to function as intentionally there is a need for a minimum landing size of 7 cm and that the criteria for closing the RTC is set to number of shrimp, not the weight (biomass) of shrimp.

CAB response:
Since the site visit in May 2015, and the reception of this letter from WWF, progress has been made in relation to most of the issues raised. The Norwegian authorities have now introduced legislation to increase the current minimum size to 7 cm, and created a Real Time Closure (RTC) system for shrimps in the area south of 62 degrees North. Work on the selectivity of shrimp gear to reduce the discarding of small shrimps continues through, for example, the NORDEN project. Discussions continue between the EU and Norway (during the the Fisheries Consultations on the regulation of fisheries in Skagerrak and Kattegat) on a management plan for the shrimp fishery including a harvest control rule, and at a meeting in Lofoten Islands, Norway in May 2015, the parties considered a proposal by Norway to request ICES advice on various components of a joint management plan including a TAC determined by an explicit harvest control rule, in-year revisions of the TAC based on the January stock survey, inter-annual quota flexibility, and the sensitivity of TAC calculations to uncertainty about discard rates. No agreement was reached at the meeting on the request to ICES for advice, and the joint management plan remains therefore under development. However Norway did unilaterally submit a request to ICES for advice on the issues outlined above, and the NIPAG working group provided an initial response in its 2015 report. Whilst progress has undoubtedly been made on a number of these issues, the assessment team raised **conditions** to implement a well-defined harvest control rule and to obtain sufficient data to evaluate bycatch rates in the trawl without a grid in the inshore fisheries, and a **recommendation** to improve the selectivity of the gear to minimise discarding of small shrimps.

Have a great day – and please feel free to ask more questions or make comments to the information I gave you.

All the best
Fredrik

Fredrik Myhre
advisor, fisheries and marine conservation
WWF-Norge
Postboks 6784 St.Olavs plass
0130 Oslo
Mob: +47 414 51 739
Tel: +47 22 03 65 00

Twitter: FredrikGMyhre
Skype: fmyhre81

Appendix 3.2 Comments to Public Comment Draft Report

The **Public Comment Draft Report** was published 26 February 2016. Comments to the PCDR were received from:

- MSC Technical Oversight / Dan Hoggarth, Fisheries Oversight Director
- WWF Norway

The stakeholder comments are included in full below, followed by explicit responses of the team to points raised in comments on the PCDR that identify the specific (if any) changes made to scoring, rationales or conditions, and a substantiated justification for not making changes where stakeholders suggest changes but the team has made no change.

Comments from MSC and response from CAB

www.msc.org

Marine House
1 Snow Hill
London EC1A 2DH
United Kingdom
Tel: +44 (0)20 7246 8900
Fax: +44 (0)20 7246 8901

Date: 24/03/2016

SUBJECT: MSC Review and Report on Compliance with the scheme requirements

Dear Julian Addison

Please find below the results of our partial review of compliance with scheme requirements.

CAB	Det Norske Veritas Certification AS (DNV)
Lead Auditor	Julian Addison
Fishery Name	Norway Skagerrak and the Norwegian Deep cold water prawn fishery
Document Reviewed	Public Comment Draft Report

Main ID	Sub ID	Page	Grade	Requirement version	OversightDescription	PI	CABComment
16934	19539	13, 31, 165-66	Major	CR-27.10.6.1 v1.3	PI 3.2.3 - SI a. It is not clear how this scoring issue is met at the SG80 level. In the background section to the report it is indicated that there may be some high-grading in the Norwegian fishery but there is no evidence that high-grading occurs on a regular basis (p.31) and that it is not observed regularly (p13). However there is no explanation in the report that the team can confirm that the system would be able to identify whether or not high-grading occurs regularly. On page 13 a comparison of the Danish, Swedish and Norwegian systems are made. The high score in the Danish fishery for this PI is explained by information from indirect evidence based on size composition of landings, Ministry inspections at sea and observer sampling of catch composition. None of this information is provided for the Norwegian system (in fact the report indicates that high % of large shrimp in the Norwegian landings compared to the Danish suggests that the proxy of using the Danish discard rate for the Norwegian fishery may not be appropriate).	3.2.3	**As follows from 3.2.3 b) and c) in the report, inspection statistics demonstrate that compliance is generally high in the fishery. An MCS system is in place and has demonstrated an ability to enforce relevant regulations, such as catch (volumes), gear and area restrictions. Hence, SG 80 is met. However, high-grading has been identified as a challenge in the fishery, although it is not considered by enforcement authorities to occur on a regular basis. The lack of permanent observers on board implies that the system cannot be considered as sufficiently comprehensive and able to consistently demonstrate an ability to enforce all regulations. On this basis, the team agrees to reduce the score for 3.2.3 a) from 100 to 80..**

16934	19544	73	Guidance	CR-27.12.2.1 v1.3	The report gives a thorough description of traceability, but it is still unclear what the risk of mixing and/or substitution at and following point of alnding. Are non-certified prawns handled at the same site, at the same time? Who conducts this activity - is it the sales organisation (non-certified)?		**Certification includes all Norwegian vessels having a license to fish prawns. If there should be landings of non-certified prawns by foreign vessels, the system with landings/sales notes that includes information about vessel (also nationality) , fishing area, etc. will disclose this and substitution of of certified with non certified prawns at the point of landing or sale will be avoided. All the sale of prawns on the first hand is conducted by the Sales organisations .** **During the last three years no foreign shrimp vessels have been registrated in Norwegian landing points.** **The system is similar when landing in Sweden.** **The report is amended with this clarification.**
16934	19559	74	Guidance	CR-27.12.1.6 v1.3	FCR v2.0 requires fisheries reports to name the number and location of points of landing. These are described in the report, but not named. Please be aware that this will be required in the future.		**Is noted**

Comments from WWF Norway

WWF-Norway
P.O. Box 6784 - St. Olavs plass
0130 Oslo
Norway

Tel: +47 22 036 500
Fax: +47 22 200 688
wwf@wwf.no
www.wwf.no
facebook.com/WWFNorge

for a living planet®

let Norske Veritas Certification
ttn: Sigrun Bekkevold

Ma email)

26 March 2016

WWF Comments on the PDCR for the Norway Skagerrak and the Norwegian Deep cold-water prawn fishery

WWF welcomes your request for feedback on the Public Comment Draft Report (PCDR) for the *Norway Skagerrak and the Norwegian Deep cold-water prawn fishery*. WWF actively engages as a stakeholder in a number of Marine Stewardship Council (MSC) fishery assessments and audits to improve fisheries sustainability. We are involved in several MSC certification processes in the North East Atlantic, with a special focus on the impacts of fishing operations in endangered species and vulnerable habitats. We were also actively engaged in the present certification process and provided feedback at your stakeholder meeting and through written emails during this process. Unfortunately, it seems that our concerns have not been sufficiently considered in the present PCDR. According to WWFs view, the score given to several performance indicators cannot be justified. There is also new information from ICES available, which is significant and must be included in the PCDR.

Generally, as a cofounder of the MSC and a prominent NGO engaged in marine conservation work, WWF maintains a vested interest in ensuring the integrity and credibility of the MSC process. Specifically, WWF has a discrete interest in ensuring the robustness of the assessment of the Norway Skagerrak and the Norwegian Deep cold-water prawn fishery as the certification of this fishery without adequately applying the requirements set out by MSC will result in a negative consequence for the management and conservation of *Pandalus borealis* in the area, considering that the Danish and Swedish fisheries will have to harmonize with this assessment. We are looking forward to understanding how you will address our issues and concerns.

Best regards,

Tatjana Gerling
Senior Manager
WWF Smart Fishing Initiative

Heidi Sørensen
Marine & Terrestrial Team Leader
WWF-Norway

Contact details	
Name:	*Fredrik Myhre*
Position:	*Fisheries and marine conservation officer*
Organization:	*WWF-Norway*
Mailing Address:	*Kristian Augusts gt. 7A, PO Box 6784 St Olavs Plass, 0130 Oslo, NORWAY*
Tel:	*+47 414 51 739*
Email:	*fmyhre@wwf.no*
Assessment details	
Fishery	Norway Skagerrak and the Norwegian Deep cold-water prawn fishery
Certification Body	Det Norske Veritas Certification Sigrun Bekkevold (lead auditor)
Assessment Stage	*3. Public review of the draft assessment report*

Comments:

1.2.1 Harvest strategy & 1.2.2 Harvest control rules & tools

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification

There is an increased discard in the Norwegian, the Swedish and the Danish fishery. The International Council for the Exploration of the Sea (ICES) recently updated this information, and the numbers indicates as much as over 21 percent bycatch in the Norwegian fishery for 2014 (see Table 1.).

ICES: "*Discarding practices in the Norwegian fishery are unknown, and Norwegian discards have been estimated by applying the Danish discard ratio to Norwegian data*". Estimated discard of shrimp in Norwegian shrimp fishery for 2014: 1289 tons (21 percent)[1].

Table 1. ICES *Published 18 March 2016; Advice on fishing opportunities, catch, and effort*

Year	Denmark *	Norway *	Sweden *	Total landings	Estimated Swedish discards	Estimated Norwegian discards **	Estimated Danish discards	Estimated catch
2012	1454	4795	1521	7771	683	288	92	8834
2013	1026	5162	1181	8379	365	451	185	8279
2014	1452	6124	1387	9853	572	1289	516	12340

* Swedish (all years), Norwegian (since 2000), and Danish (since 2003) landings have been corrected for loss in weight due to boiling.
** Discarding practices in the Norwegian fishery are unknown, and Norwegian discards have been estimated by applying the Danish discard ratio to Norwegian data.

Fortunately, WWF believes that the newly implemented Real Time Closure zone and new minimum landing size of 7 cm in Norwegian EEZ will address some of this problem. WWF would however point out for the assessment team that there is no knowledge of the effectiveness of the newly implemented RTC or adjusted minimum landing size for shrimp yet documented.

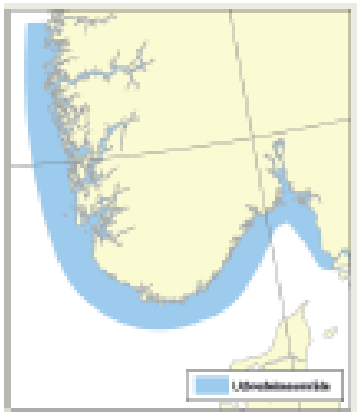

Figure 1. Distribution of coastal cod (Institute of Marine Research, Norway. 2015)

WWF would like to see the assessment team consider the harvest strategy (1.2.1) and harvest control rules & tools (1.2.2) based on the new and significantly higher discard numbers for shrimp in Skagerrak and the Norwegian Deep. The assessment team must also include that no documented effects of the RTC or new minimum landing size exist as of today.

Note: The new numbers from ICES also indicates a discard of 21 percent in the Danish fishery and a **discard of 41 (!) percent in the Swedish fishery.**

[1] ICES Advice Northern shrimp (*Pandalus borealis*) in Divisions 3a and 4a East (Skagerrak, Northern North Sea in the Norwegian Deep (2016)

PI 2.1.1 Outcome

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification

WWF cannot see that the assessment team have considered the Norwegian shrimp fishery's impact on endangered and historical low coastal cod (with also is retained) South of 62° N[2] in any way. The stocks of coastal cod are especially relevant within the 4 nautical mile zone, an area which are not even having a mandatory sorting grid for fish. Even with the sorting grid in place, the coastal cod will be caught if the trawl is equipped with a fish bag when targeting for commercial fish species (including coastal cod).

The Directorate of Fisheries in Norway has also stated that they would like to see a mandatory use of sorting grid within the 4 nm zone[3].

WWF would like to see that the assessment team describe and consider endangered and historical low stocks of coastal cod in the assessment. Furthermore, WWF would like to encourage the assessment team to include a mandatory sorting grid within 4 nm as a condition in this fishery.

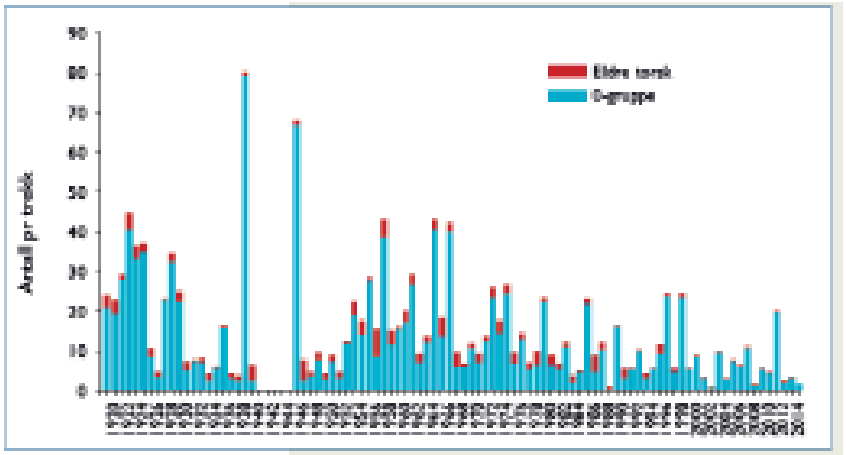

Figure 2. Yearly catch of coastal cod from Segne – Fredriksted (© Institute of Marine Research, Norway. 2015)

2.1.2 Management

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification

In relation to 2.1.1; WWF would like to point out that there is no recovery plan for the coastal cod South of 62°N in Norwegian EEZ. There were quite a few recommendations made by the Institute

[2] Havforskningsrapporten 2015. Institute of Marine Research 2015 (Norwegian only).

[3] Fiskeridirektoratets strategi for bedre forvaltning av rekebestandene i Nordsjøen og Skagerrak. 2015. (Norwegian only)

of Marine Research in 2008, but no recovery plan has been made and implemented. The Directorate of Fisheries in Norway also supports a recovery plan for coastal cod south of 62° N[4].

WWF would like to see that the assessment team includes information about the lack of recovery plan for coastal cod south of 62°N in the process and uses this information in their description and consideration of management for retained species.

2.3.2 Management

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification

The information on bycatch of ETP species in the Norwegian shrimp fishery in Norwegian EEZ is lacking. There is no knowledge of bycatch of none-commercial species in the Norwegian shrimp fishery, including endangered shark and ray species[5]. There is some landing numbers for some of the species, but the actually catch has never been investigated in a scientific manner. For example; ICES recommends a zero catch of spiny dogfish (also called spurdog, ICES) and a reduced catch for skates and rays in general (not specific for the shrimp fishery). WWF believes that some of these ETP species, especially within the 4 nm zone can be caught on a regularly basis by shrimp vessels. Spiny dogfish is known for aggregating in huge schools twice a year, close to shore. The spiny dogfish is listed as "critical endangered" in the North-East Atlantic on the international redlist of endangered animals by IUCN[6]. Artsdatabanken[7] also lists the spiny dogfish as "endangered" on the Norwegian redlist of endangered animals. ICES points out that the North-East Atlantic stock of spiny dogfish most likely has moved more into Norwegian waters lately, and WWF believes this means that Norway has an even greater responsibility when managing this endangered species.

"*The effect of changes in the environment on spurdog populations is not known. There may be indirect effects, as spurdog predate on small pelagic fish, which are affected by environmental conditions. An increased frequency of occurence in Norwegian waters in recent years may be caused by immigration to this area due to food availability and favourable environmental conditions.*"[8]

[...]

"*There are concerns over the quality of the catch data (including total catch and length compositions of the landings). Discarding rates since the zero TAC was introduced are uncertain, as is the survivorship of the discards. In the absence of commercial data, information from scientific trawl surveys will be increasingly important to monitor any stock recovery.*

An estimate of total catch is used in the assessment for the years after the introduction of a zero TAC. Reported landings are not representative of true removals.»[8]

WWF would also like to point out that bycatch information about the nearly threatened rabbit fish (*Chimaera monstrosa*) is lacking in Norwegian EEZ.

[4] Havforskningsrapporten 2015 (Norwegian only)
[5] Institute of Marine Research in Bergen, Norway. 2015
[6] IUCN
[7] Artsdatabankens National Redlist 2015
[8] ICES Advice Oct 2014: Widely distributed and migratory stocks Spurdog (Squalus acanthias) in the Northeast Atlantic

WWF encourages the assessment team to include a condition for specifically mapping ETP species caught in the Norwegian shrimp fishery in the Skagerrak and Norwegian Deep, including within the 4 nm zone.

2.3.3 Information

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification

WWF do not agree with the assessment team in that "the Norwegian fishery should be sufficient for the impact of fishing to be quantitatively estimated for ETP species. The argument for having estimates of discard rates of ETP species in the fishery area from observer programme in the Danish and the Swedish fishery is not sufficient to determine the bycatch and discard of ETP species such as the spiny dogfish, especially within the 4 nm of Norwegian EEZ.

WWF encourages the assessment team to include a condition for specifically mapping ETP species caught in the Norwegian shrimp fishery in the Skagerrak and Norwegian Deep, including within the 4 nm zone.

2.4. Benthic habitats

Nature of comment

- Conditions and proposed actions set for PI 2.4.1 and 2.4.2 are not adequate to improve fishery's performance to the 80 level of performance. There is a need to harmonize and to coordinate actions between similar MSC certified fleets in the area.

Justification

WWF is concerned that the fishery for Pandalus borealis still have significant, irreversible negative impact on sensible habitat types and communities of the Skagerrak area and Norwegian Deep. Many known vulnerable marine ecosystems (VME) hotspots are still lacking protection (e.g. Bratten) from adverse fisheries impacts. Therefore it is eminently important that sustainable fisheries operate in a precautionary way and implement mitigation measures beyond the current legislation levels. WWF is aware that it is not the role of the CAB to raise conditions that are overly prescriptive. However, the CAB shall require the client to prepare a "client action plan" and we want to point out, that the action plans of the Swedish and Danish Pandalus fleets are much more ambitious and therefore more realistic to achieve a performance level of 80 in the time frame of the certification.

For comparison, in the first year the Danish fleet will:

- avoid fishing in known sensitive areas/positions
- analyse and record all interactions with VME habitats in every fishing haul

In the second year:

- they will provide updated overlay maps of VMS, seabed habitats and Natura2000 and OSPAR features in order to show that the fleet as instructed avoids known sensitive areas/positions

Also the Swedish fleet will (beginning in the first year) initiate voluntary restrictions on the fishing activity in sensible areas and they will implement procedures for monitoring and recording interactions with VME habitats.

In contrast, the proposed action plan of the Norwegian fleet for the first two years includes only an assessment of the extent of potential harm to habitat structure in the area (first year) and a dialogue with IMR and the Directorate of Fisheries to determine what management measures can be taken to mitigate harm (second year). If mitigation measures are needed, they will be implemented within SA 4.

Given the fact that a) there is overwhelming scientific proof of the harmful impact of benthic trawling on VMEs b) large areas in the area where VMEs formerly existed are already damaged or wiped out c) there is sufficient knowledge on the location of existing VMEs d) there is a known overlap of fishing activity with VMEs (e.g. Bratten) d) there is no proper benthic bycatch analysis and report system in place e) the two other MSC certified Pandalus fleets implement mitigation measures from the start/ first year to avoid VMEs, it must be concluded that the action plan of the Norwegian fleet is far from precautionary. It is also unlikely that after 5 years there will be an objective basis for confidence that the partial strategy works (because the partial strategy will be implemented only one year before and there will be not enough time to collect data and to test if the strategy works). Additionally, actions based on the suggested action plan will not fulfil the 2nd year milestones. The fishery should provide evidence (if necessary) that the risk of impact of the shrimp fishery on coral gardens and deep sea sponge aggregations has been reduced at the 2nd annual surveillance. However mitigation measures will be implemented not until SA 4 (see action plan).

2.4.3 Information

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification

In contrast to the two other certified Pandalus fisheries in the same area, the Norwegian fishery scores 80 in P.2.4.3 and has therefore no condition. This is justified with the implementation of a "move-on" rule when VME habitats are encountered. Regulation J-128-2011 requires that "collisions" between fishing gear and corals and sponges (defined by 60 kg corals or 800 kg of sponges in a haul) must be reported and move-on rules apply (this is now replaced by J-40-2016,defined by new threshold levels of 30 kg of corals and 400 kg of sponges in a haul[8]). However, this can not be used as justification that sufficient data continue to be collected to detect any increase in risk to habitat. This measure has no effectiveness. The Norwegian Pandalus fishery utilizes Nordmore grids which sort out larger benthic bycatch (everything >20mm including corals, sponges etc.). Therefore encounter thresholds could potentially never be reached even when the net is towed in areas with high VME abundances. This effect is also described in the 2nd annual surveillance report of the Estonia cold water prawn fishery (the use of the Nordmore grids with bar spacing of 22 mm that may inhibit the by-catch of sponges and corals (Silver Siirp, Estonian Marine Institute, pers. comm.)

Therefore, WWF believes a condition should be raised to ensure that information on interactions of fishing operations with VME habitats is collected on a continuous basis.

2.5.2 Management

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

[8] J-40-2016, Directorate of Fisheries, Norway

Justification
WWF would like to highlight the lack of recovery plan for endangered and historical low stocks of coastal cod south of 62° N in Norwegian EEZ. Coastal cod is also being caught by Norwegian shrimp vessels, especially within 4 nm. WWF would also point out that there is no scientific information on ETP bycatch in the Norwegian shrimp fishery, and that the comparison to the Danish and Swedish fishery is insufficient, especially within the 4 nm zone. WWF do not agree with the assessment team in scoring issue a and b. As the assessment team states in their justification of 2.5.3 scoring issue b:

"*The main interactions between the shrimp fishery and these ecosystem elements have not been fully investigated and so the SG100 is not met.*"

If a fishery management do not have understanding of main interactions between the fishery and the important ecosystem elements, you don't have a SG100 management of that fishery. WWF believes SG100 is not met.

WWF encourages the assessment team to include two conditions in the management of the Norwegian MSC shrimp fishery: (1) establishing a specific plan for mapping out ETP species in the fishery, and (2) highlighting the need for a general recovery plan for coastal cod.

3.1.1 Legal & customary framework

Nature of comment
- Not all relevant information has been used to score this Performance Indicator

Justification
WWF do believe that the assessment team is referring to the management plan for the North Sea and Skagerrak (2013) and not to the management plan for the Norwegian Sea (2009) as stated in their justification in 3.1.1 a.

3.2.1 Fishery specific objectives

Nature of comment
- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification
WWF do not agree with the assessment team in having SG100 met. Norwegian fishery management do not have well defined and measurable short and long-term objectives consistent with achieving the outcomes of MSC Principles 1 and 2 for several none-commercial marine species. There is also a severe lack of knowledge in species-to-species interactions and species-to-habitat interactions, both for many commercial and none-commercial species. Many of the none-commercial marine species (including ETP species) are found within the 4 nm zone of Norwegian EEZ.

WWF encourages the assessment team to include a mandatory sorting grid for fish within 4 nm as a condition in the management of the Norwegian MSC shrimp fishery. This is also supported by the Directorate of Fisheries. A mandatory sorting grid would also potentially reduce impact of endangered and threatened stocks of coastal cod accordingly to the Institute of Marine Research. A mandatory sorting grid within 4 nm could also be beneficial to other endangered species, such as the spiny dogfish.

3.2.3 Compliance & enforcement, d

Nature of comment

- Not all relevant information has been used to score this Performance Indicator
- Information and/or rational is not adequate to support the given score

Justification

As pointed out during our stakeholder meeting, WWF would like to highlight the fact that both the Directorate of Fisheries in Norway and the Norwegian Coast Guard have stated that all shrimps under 6 cm (most likely under 7 cm) has historically being discarded (dumped) back to sea in the Norwegian shrimp fishery[9,10]. This is the main reason for the implementation of Real Time Closure (RTC) zones and an increased minimum landing size of shrimp from 6 cm to 7 cm in Norwegian EEZ.

WWF would like to see information of discard (dumping) of shrimp as described by the Directorate of Fisheries and the Norwegian Coast Guard included, commented and considered by the assessment team. Also related to the new data (March 2016; as described in 1.2.1) from ICES in this fishery.

Response to WWF comments from CAB

General response from CAB:

The assessment team thanks WWF for their detailed and constructive comments on the PCDR for the Norway Skagerrak and Norwegian Deep cold water prawn fishery.

The assessment team notes WWF's concern that not all relevant information has been used to score several Performance Indicators and that information and/or rationale is not adequate to support the given score for some Performance Indicators, and the assessment team has provided responses to each of the concerns raised in the text below.

Reponses to comments on specific PIs

1.2.1 Harvest strategy and 1.2.2 Harvest control rules and tools

We note WWF's comment that the assessment team should consider new data on discard levels in the Skagerrak and Norwegian Deep shrimp fishery that have recently been published by ICES. In fact, these are the same data that are described in section 3.2.3 and 3.4.2 of the PCDR. WWF notes that the estimated discards of shrimp in the Norwegian shrimp fishery in 2014 were 1289 tonnes which equates to a discard rate of 21%. The assessment team believes that WWF has made an error in their calculation of the discard rate. As ICES data show, there were 1289 tonnes of discards and 6124 tonnes of shrimp landed, which gives a discard rate of 1289/(1289 + 6124) = 17%. We believe that WWF erroneously calculated the discard rate as 1289/6124 = 21%. The figure quoted for discard rates in Sweden has also been calculated erroneously.

On that basis, there is no new information provided by ICES, and the assessment team has no need to revise their conclusions. The assessment team agree with WWF that the newly-implemented Real Time Closure (RTC) zone and the new minimum landing size will help to address the problem of discarding in the shrimp fishery. Two recent closures under the new RTC regulation provide evidence that the regulation is working.

The score for these PIs remains unchanged.

2.1.1 and 2.1.2 Retained species outcome and management

WWF commented that the assessment team had not considered low stocks of coastal cod in the assessment of the potential impact of the shrimp fishery on retained species, particularly within the 4nm zone. The assessment team has now considered coastal cod in the scoring of PI 2.1.1 and 2.1.2. There is no information about the quantity of coastal cod caught in this fishery, as catches of coastal cod are not distinguished from North Sea and Skagerrak cod, but a condition was raised against PI 2.2.3 which requires the collection of discard information from vessels fishing within the 4nm zone, and this condition should provide the necessary information on capture of both retained and by catch species. The assessment team also recognised WWF's concern that the sorting grid is not mandatory within the 4 nm zone. Our report emphasises that many Norwegian vessels use a grid both inside and outside the 4nm zone, and that fishing without the use of a grid constitutes only a small component of the total Norwegian shrimp fishery. The assessment team considered therefore that the management measures in place are sufficient to meet the SG80. However in line with WWF's comments, the assessment team revised their rationale for PI 2.1.2 and concluded that there is not a strategy in place for managing **all** retained species because of the lack of a recovery plan for coastal cod and the lack of legislation requiring the use of a sorting grid within 4 nm. The SG100 is not met therefore for SIa, b c and d.

The overall score for PI 2.1.2 was reduced from 95 to 80. In addition the assessment team made a recommendation that the sorting grid should be mandatory within the 4nm zone.

2.3.2 and 2.3.3 ETP species management and information

The assessment team notes WWF's encouragement to include a condition for specifically mapping ETP species caught in the Norwegian shrimp fishery including in the 4nm zone. Current legislation in Norway requires that ETP species must be recorded in log books, and ETP species are covered by the general prohibition on discarding. Regulation J-250-13 determines that for porbeagle, basking shark, spurdog (not defined as an ETP species by MSC) and silky shark, live individuals of these species should be released immediately, whereas dead or dying individuals should be recorded in the log book (but not necessarily landed). The assessment team recognised that this system of recording may not work perfectly and therefore made a recommendation that systems are put in place to ensure that all ETP species are recorded on log books irrespective of whether they are landed or discarded.

There is information available from observer sampling of the Swedish and Danish shrimp fleets on capture of ETP species in the Skagerrak and Norwegian Deep shrimp fishery and the assessment team considered that similar catch rates would occur in the Norwegian fishery. However we do recognise that capture of ETP species by shrimp vessels may be more likely within the 4nm zone, and we believe that the condition that was raised against PI 2.2.3 (requiring the collection of discard information from vessels fishing within the 4nm zone) will help provide the information required for ETP species. (The assessment team notes that spurdog is not technically an ETP species under MSC definitions, but we have highlighted that the condition raised against PI 2.2.3 will provide important information about capture and discarding of all bycatch species including ETP species). The assessment team believes therefore that the current data recording requirements, along with data from the Swedish and Danish fleets, the condition on PI 2.2.3 and the recommendation to record all ETP species landed or discarded are sufficient to meet the requirements of PI 2.3.3. However we have revised the recommendation to state that "*systems are put in place to ensure that all ETP species are recorded on log books irrespective of whether they are landed or discarded and that the captures of all ETP species are mapped*."

The assessment team believes that the score for PI 2.3.3 should remain at 80, and has strengthened the recommendation.

2.4.1 and 2.4.2 Benthic Habitats

WWF note that the client action plans for the conditions raised against PIs 2.4.1 and 2.4.2 for the Swedish and Danish *Pandalus* fisheries are more realistic and more likely to achieve a performance level of 80 within the time frame of the certification than the Client Action Plan proposed by the Norwegian client. The Norwegian Client has done some minor revisions on the client action.

2.4.3 Information

We accept WWF's view that the threshold levels for the move-on rule of 30 kg of corals and 400 kg of sponges in a haul as defined in Regulation J-40-2016 may be ineffective. We agree that the use of sorting grids in the Norwegian shrimp fishery ensures that any large (>20mm) benthic bycatch will pass through the grids and will not be caught by the trawls. It is possible therefore that the encounter thresholds specified under J-40-2016 may never be reached even when the trawl is towed in areas with high abundance of corals and sponges or other VME habitats. Interactions between fishing gear and VME habitats may go unrecorded in areas where VME habitats have not been previously recorded.

We have therefore concluded that the SG80 is not met for scoring issue c, and therefore the score for PI 2.4.3 is reduced to 75. A condition is raised requiring the development and implementation of procedures for monitoring and recording all interactions with VME habitats in each fishing haul.

2.5.2 Ecosystem management

The assessment team notes WWF's comments on scoring issues a and b, but having reviewed the rationales given for these scoring issues, considers that the SG100 is met for both scoring issues. There is a strategy in place which consist of a plan (SG100a), and it is noted that to meet the SG100b, "..at least some of these measures are in place", i.e. not **all** measures need to be in place. We agree with WWF that the main interactions between the fishery and the ecosystem elements have not been fully

investigated and therefore PI 2.5.3 scores lower than PI 2.5.2. We refer to our previous comments about introducing conditions for mapping ETP species and implementing a recovery plan for coastal cod.

The score for this PI remains unchanged.

3.1.1 Legal and customary framework

The team agrees to WWF´s comment and has changed the reference in the report.

3.2.1 Fishery specific objectives

The team agrees with WWF that it can be argued that the management system's short- and long-term objectives for certain P2 species are not sufficiently well defined and measurable to warrant a 100 score. Since there is only one SI under this PI, a partial score is possible. The team maintains that objectives for the P1 species are adequate to meet the SG 100 requirement and therefore concludes with a partial score on this SI, reducing the score from 100 to 90 for 3.2.1.

3.2.3 Compliance and enforcement

As follows from 3.2.3 b) and c) in the report, inspection statistics demonstrate that compliance is generally high in the fishery. An MSC system is in place and has demonstrated an ability to enforce relevant regulations, such as catch (volumes), gear and area restrictions. Hence, SG 80 is met. However, as WWF points out, high-grading has been identified as a challenge in this fishery, although enforcement authorities have no evidence that it occurs on a regular basis. The lack of permanent observers on board implies that the system cannot be considered as sufficiently comprehensive and able to consistently demonstrate an ability to enforce all regulations. On this basis, and following TO comments by the MSC, the team agrees to reduce the score for 3.2.3 a) from 100 to 80.

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. THE DIRECTORATE OF FISHERIES' STRATEGY FOR IMPROVED MANAGEMENT OF THE SHRIMP STOCKS IN THE NORTH SEA AND SKAGERRAK

28 April 2015.

Introduction

Shrimp fishing and management of shrimp stocks in Skagerrak and the North Sea has come into focus after WWF Sweden (followed by WWF Norway) have put the shrimp on a separate red list. This has resulted in market-related issues in Sweden, especially in the Stockholm area that is the most important shrimp market in Sweden. In Norway, Denmark and Sweden, fishermen and other related parties have worked to make the shrimp fisheries MSC (Marine Stewardship Council) certified. This work has stalled, partly because of WWF 's Red Listing.

Discard of small shrimp, fish fry and small fish is the main reason that the shrimp fishery in the North Sea and Skagerrak have not received MSC certification.

This has led to the shrimp fishery in the south has been the administration's focus in recent times, and in 2014 and so far in 2015 it invested substantial resources in the policy area. The Directorate of Fisheries, along with fishing tool manufacturer Norden in Sweden, arranged a meeting in Smøgen in Sweden in the summer of 2014, with representatives from governments, research, equipment manufacturers, fishermen, receivers and environmental organizations in Norway, Denmark and Sweden participating. There, management and other issues related to shrimping in the North Sea and Skagerrak were thoroughly discussed. Discard of small shrimp (shrimp with a size under commercial value) was seen as the biggest problem to be solved urgently. High grading (discarding of shrimp with a size that would normally be plucked for industrial purposes) was also identified as a major problem.

The Directorate of Fisheries have worked to identify measures that can counteract this negative trend, aiming to reduce the discard of shrimp. This applies initially developing the technology and methods to sort out small shrimp of catches. This work is done in close cooperation between industry, research and management in Sweden, Denmark and Norway. Moreover, possible amendments to current legislation, which will help reduce discards, have been investigated.

Norway and the EU has initiated work to develop a management plan for shrimp in these areas.

The Directorate of Fisheries believes that there is a need for various measures to reduce discarding of shrimp in the North Sea and Skagerrak and make fishing operations more feasible. In order to structure the work ahead and clarify the Directorate's view on the matter, there has been developed a strategy for improving the management of the shrimp fishery in the North Sea and Skagerrak. In the following, this strategy is disclosed. Further description of the situation and possible measures are provided in annex.

Strategy for improvement of the management of the shrimp fishery in the North Sea and Skagerrak.

1. Extending the RTC regime to also apply for shrimp. Allow shrimp fishing to continue in closed areas, provided that selective devices are used. Consider adjusting the current minimum of 6 cm up to the commercial minimum size of about 7 cm. Alternatively, the commercial minimum size could be assumed as a closing criterion.
2. Evaluate the exception of the landing obligation, cf. Regulations relating to the exercise of fishing in the lake § 48, for bycatches of Norway pout and blue whiting in the shrimp fisheries, and clarify the term shrimp to only include Pandalus borealis, in order to limit the discard ban to this.
3. Working on the development of selection systems to sort out small shrimp.
4. Extending the scope of mandatory use of sorting grids to also include those within 4 nautical miles of the baselines south of 62 °N. Consider possible exceptions to the general obligation to possibly use "crayfish hole" (to minimize any loss of crayfish) in shrimp fisheries in certain areas within the 4 nautical miles limit, as well as any other exemption rules for use of the grid.
5. Develop management plan in cooperation with the EU.

Items 1-4 are a purely Norwegian venture, whereas item 5 is a joint project with the EU.

Measures referred to in item 1 to 3 should be given the highest priority. Measures referred to in item 4 will be executed after items 1-3 are completed.

ANNEX

Details of some initiatives.

- **Discard of small shrimp**

All shrimp under 7 cm is assumed to be discarded. Shrimp less than 7 cm cannot be automatically processed (plucking machine). Within the cooperation that occurred in Smøgen, attempts to sort out small shrimp of the catches are executed. The Safe-grid (Trygg-risten) has so far proven to be the method that is most effective and functional. However, it can be improved and adjusted for optimum commercial use. Selectivity is tested as an alternative solution in Sweden. It is not time to enjoin such systems, because there are yet no satisfactory solutions in technical terms.

  - Therefore, the Directorate of Fisheries should propose an expansion of the RTC system to be able to shut areas where the proportion of shrimps below the minimum, or another reference size is larger than a certain percentage. Fishing for shrimp in these closed areas should be allowed if functioning sorting systems are installed in the trawler (eg. the Safe-grid).

- **High-grading of shrimp**

The largest shrimp (over approx. 10 cm) is used for cooking which is the highest-paid product, and have a far greater economic value than shrimp that goes to industry (plucking). Vessels with a restricted quota or trouble to get provisions for smaller shrimp thus have incentive to dump all or part of the catch below a given size (about 10 cm). By adjusting the distance between the laths, sorting devices such as the Safe-grid could be used for sorting small shrimp. The advantage is that such sorting takes place when the trawler is on the bottom and the unsorted shrimp then have the opportunity to survive after they are sorted from the catches.

- **Discard of small fish**

The limitations of using sorting grids in the shrimp fisheries is that it to a limited extent sorts out the fish below a given size (about 20 cm). For the North Sea and Skagerrak, this primarily concerns species such as the Norway pout and blue whiting. These two species may in some areas and periods represent more than 20% by weight of the total catches made by shrimping nets. However, it is not a large quantity of Norway pout and blue whiting taken in shrimping nets, in the context of the total annual landings that goes to fish meal/oil production. Bycatches of Norway pout and blue whiting in shrimp fisheries is virtually impossible to sell because the only potential beneficiary is fishmeal factories. In many cases, these factories are situated far away from where the shrimp catches are landed, and they do not produce such small quantities that these bycatch landings will pose. The Coast Guard has until now taken a pragmatic approach to the enforcement of this issue. After the Marine Resources Act § 15 first paragraph, first sentence, all catch of fish should be brought ashore. Exceptions are set out in § 15 first paragraph second sentence. The principle of landing is strong, and it substantial reasons are needed to make exceptions to the general rule. However, in the preparatory work of the Marine Resources Act, cf. Ot.Prp no. 20 (2007-2008) page 91, it is written that dead fish that are not negotiable, "It should be assessed in what incidents it should be allowed to discard fish without a commercial value, such as sea cucumber, scrap fish, different types of bycatch in the shrimp fishery and so on."

Taken into account the situation as described above, it is proposed to grant exemptions from the landing obligation, cf. Regulations on the exercise of fishing in the lake § 48, for vessels receiving bycatches of Norway pout and blue whiting in shrimp fisheries.

Bycatch of so-called "white shrimp" represents an equivalent problem in the shrimp fishery. This can be solved by writing "shrimp (Pandalus Borealis)" in Act §48, 1, paragraph in the executive regulations as is done in Act §48 paragraph 2 where the ban on discards in Skagerrak is discussed.

- **Regulations within 4 nautical miles from the baselines.**

Until now regulations on shrimping within 4 nautical miles have not resulted in mandatory use of sorting grids. The focus has been on fishing off the 4 nautical miles of the baselines. If we quickly get in place the measures referred to in item 1 and 2 in the areas outside the 4 nautical miles limit, we believe it is reasonable to assume that it will be easier to extend the scope to include within this limit. The market situation and the need for MSC certification can also lead to such requests coming from the industry itself. However, it is quite necessary to be prepared to consider some special measures within 4 nautical miles limit, since the majority of the vessels engaged in this fishery are smaller. An example of this could be to allow so-called "crayfish holes" or exemptions from the order, i.e. in areas such as inner Oslo Fjord. There is a need to investigate this further.

- **Special measures**

There may occur periodically (each year) special situations in the shrimp fishery where there is a need to grant an exemption from the use of sorting grids. First and foremost, this is applicable when blooms of jellyfish or other organisms are so great that the grates are unable to sort them out and grids or trawls become congested. In such circumstances, regulation authorities must act quickly in order to both solve this problem for the fishermen and simultaneously avoiding criticism for having commanded solutions that hampers fishing.

- **Management plan.**

Norway and the EU have agreed to develop a management plan for shrimp in the North Sea and Skagerrak. On February 17 a meeting between Norway and the EU took place, where a framework for such a plan was described. Researchers from Norway and Denmark are working on formulating questions for ICES to consider whether such a plan would be considered as sustainable. The aim is to submit such matters to ICES during March this year to have an assessment from ICES well before the negotiations will start this fall.

APPENDIX 7. REGULERING AV FISKET ETTER REKER I NORDSJØEN OG SKAGERAK

SAK 6/2015

REGULERING AV FISKET ETTER REKER I NORDSJØEN OG SKAGERRAK

1. SAMMENDRAG

For å redusere utkast av småreker som ikke har kommersiell verdi, foreslår Fiskeridirektøren å inkludere reker i Real Time Closure (RTC), å øke minstemålet til 7 cm, å unnta bifangst av øyepål og kolmule i rekefisket fra ilandføringsplikten og at ilandføringsplikten for reker høstet i Nordsjøen og Skagerrak skal gjelde for «*Pandalus borealis*».

Tiltakene er ledd i en forvaltningsstrategi. Strategien er vedlagt saksdokumentene.

2. BAKGRUNN

Rekefisket og forvaltningen av rekebestanden i Skagerrak og Nordsjøen har kommet i fokus etter at WWF-Sverige, etterfulgt av WWF-Norge, frarådet forbrukerne fra å velge reker høstet i disse områdene. Dette har ført til markedsproblemer i Sverige, spesielt i stockholmsområdet som representerer det viktigste rekemarkedet i Sverige. I Norge, Danmark og Sverige har fiskerne og andre relaterte parter jobbet med å få rekefisket sertifisert av MSC (Marin Stewardship Council). Dette arbeidet har stoppet opp, blant annet på grunn av rådet fra WWF.

Utkast av småreker er hovedårsaken til at rekefisket i Nordsjøen og Skagerrak ikke har fått MSC-sertifisering. Problemet har ført til at rekefisket i Nordsjøen og Skagerrak har vært i forvaltningens fokus den siste tiden. I 2014 og hittil i 2015 er det lagt ned betydelige ressurser på saksfeltet.

Fiskeridirektoratet har i denne prosessen, sammen med den svenske redskapsprodusenten Norden, blant annet arrangert et møte i Smøgen i Sverige sommeren 2014. Her deltok representanter fra myndigheter, forskning, redskapsprodusenter, fiskere, fiskekjøpere og miljøorganisasjoner i Norge, Danmark og Sverige. Forvaltning og andre saker knyttet til rekefisket i Nordsjøen og Skagerrak ble grundig diskutert. Utkast av småreker - reker med en størrelse under kommersiell verdi - ble sett på som det største problemet og krever derfor en snarlig løsning. High grading - utkast av reker med en størrelse som normalt vil bli pillet til industriformål - ble også pekt på som en stor utfordring.
Fiskeridirektoratet har jobbet med å identifisere tiltak som kan snu den negative utviklingen og redusere problemet knyttet til utkast av småreker. Tiltakene har i første omgang handlet om redskapsutvikling gjennom teknologi og metoder som kan sortere ut småreker fra fangstene. Dette arbeidet gjøres i nært samarbeid mellom næring, forskning og forvaltning i Sverige, Danmark og Norge. Videre har gjeldende regelverk blitt utredet for å identifisere mulige regelendringer som kan bidra til å redusere utkastproblemet.

Parallelt med prosessene som er beskrevet ovenfor arbeider Norge og EU med å utvikle en forvaltningsplan for reker i Nordsjøen og Skagerrak.

Fiskeridirektøren foreslår fire reguleringstiltak. Samlet sett har forslagene til formål å styrke fiskeriets bærekraft ved å redusere problemene knyttet til utkast av småreker i Nordsjøen og Skagerrak, samtidig som det blir tatt hensyn til de praktiske utfordringene fiskeren møter ved utøvelsen av rekefisket.

3. FORSLAG TIL REGULERINGSTILTAK

Fiskeridirektøren ber om innspill til følgende reguleringsforslag:

a) Inkludere reker i Real Time Closure (RTC)

For å begrense fisket av torsk, sei, hvitting og hyse under minstemål kan Fiskeridirektoratet etter gjeldende regler forby fiske med trål og snurrevad i visse områder sør for 62°N, jf. forskrift om utøvelse av fisket i sjøen (utøvelsesforskriften) § 47 annet ledd. Dette er også kjent som RTC «Real Time Closure».

I rekefisket i Nordsjøen og Skagerrak er det en stor risiko for at alle reker under 7 cm kastes ut. Blant annet fordi reker under denne størrelsen ikke kan bearbeides maskinelt («pillemaskin»). Forvaltningen, i samarbeid andre aktører, utfører nå forsøk med å sortere ut småreker fra fangstene. På nåværende tidspunkt har den såkalte «Trygg-risten» vist seg å være mest effektiv og rasjonell med hensyn til å oppnå ønsket resultat. Risten må imidlertid forbedres og tilpasses for optimal kommersiell bruk. Etter Fiskeridirektoratets oppfatning er ikke tiden moden for å påby bruk av slike systemer da de tekniske løsningene ikke anses å være fullgode.

På bakgrunn av det ovenstående, og med formål om å begrense fisket av reker under minstemål og dermed redusere utkast, anser Fiskeridirektoratet at RTC-systemet bør utvides til også å omfatte reker. Områder kan da stenges dersom innslaget av reker under minstemål er større enn en gitt andel. Fisket etter reker innenfor de stengte områdene bør tillates hvis fungerende sorteringssystemer er innmontert i trålen, for eksempel «Trygg-risten». Dette for å gi næringen incentiver til å fortsette utviklingen og bruken av slike selektive redskaper.

Fiskeridirektøren foreslår at RTC-regimet utvides til å omfatte reker. Det foreslås videre at fiske etter reker innenfor stengte områder bør tillates dersom fungerende sorteringssystemer er innmontert i trålen.

b) Øke gjeldende minstemål

Gjeldende minstemål for reker er 6 cm, jf. utøvelsesforskriften § 43 nr. 27.

Fiskeridirektoratet viser til, som nevnt under forslaget i bokstav a), at det er stor risiko for at alle reker under 7 cm kastes ut. Dette er derfor å betrakte som det kommersielle minstemålet.

Norge er alene om å ha 6 cm minstemål på reker. Minstemålet ble i sin tid fastsatt i forhandlinger mellom Norge og Russland uten at åpenbare biologiske eller kommersielle hensyn synes å ha blitt lagt til grunn som en del av beslutningsgrunnlaget.

Ved å øke minstemålet til 7 cm vil regelverket harmonere med det kommersielle minstemålet. Videre vil en slik økning være fordelaktig sett fra et biologisk synspunkt, fordi det nåværende minstemålet på 6 cm muligens gir hannreker en anledning til å reprodusere (om de gyter når de er et halvt år gamle), men ikke hunnreker. Dersom minstemålet heves til 7 cm så vil dette medføre at en del hunner rekker å legge ut rogn som også klekker, før de fiskes[1].

Minstemålet vil med den foreslåtte endringen kunne anvendes som stengningskriterium i RTC-regimet, og er derfor et utkastreduserende tiltak.

Fiskeridirektøren foreslår at minstemål for reker fastsettes til 7 cm. Dette minstemålet vil også fungere som et stengningskriterium i RTC-regimet.

c) Unntak for ilandføringsplikt av øyepål og kolmule

Sorteringsrist i fisket etter reker har begrensninger ved at den i liten grad sorterer ut fisk under en gitt størrelse (cirka 20 cm). For Nordsjøen og Skagerrak gjelder dette i hovedsak arter som øyepål og kolmule. Disse to artene kan i enkelte områder og perioder representere mer enn 20 % i vekt av totalfangstene tatt med reketrål. Det er imidlertid svært små kvantum øyepål og kolmule som tas i reketrål sammenlignet med de årlige landingene av de to artene som går til mel- og/eller oljeproduksjon.

Bifangst av øyepål og kolmule i rekefisket er tilnærmet umulig å omsette da eneste potensielle mottaker er fiskemelfabrikker. I mange tilfeller ligger disse fabrikkene langt unna steder hvor rekefangstene landes, og de produserer heller ikke så små kvanta som disse

[1] Søvik og Tangstad, The Norwegian Fishery for Northern Shrimp (Pandalus Borealis) in Skagerrak and the Norwegian deep 1970 - 2014, figur 22.

bifangstlandingene vil utgjøre. Kystvakten har frem til nå inntatt en pragmatisk holdning til håndhevelse av denne problemstillingen.

Etter havressursloven § 15 er det en klar hovedregel at all fangst av fisk skal føres i land. Prinsippet om ilandføring står sterkt, og det skal vektige grunner til for å gjøre unntak fra hovedregelen. I havressurslovens forarbeider, jf. Ot.Prp nr. 20. (2007-2008) side 91, fremkommer det imidlertid om død fisk som ikke er omsettelig at «*det bør vurderast om i kva høve det skal være tillatt å kaste ut fisk utan nokon komersiell verdi, som sjøpølse, ufisk, ulike typar bifangst i rekefisket med vidare*».

Sett hen til situasjonen slik den er beskrevet ovenfor foreslår Fiskeridirektøren å gjøre unntak fra ilandføringsplikten for fartøy som får bifangst av øyepål og kolmule i fisket etter reker.

d) Bifangst av hvitreke

Bifangst av såkalt hvitreke (glassreke) representerer tilsvarende problem i rekefisket som innslaget av øyepål og kolmule. I Skagerrak er gjeldende regulering at ilandføringsplikten kun gjelder «*Pandalus borealis*», jf. utøvelsesforskriften § 48 andre ledd nr. 3. Dette til forskjell fra Nordsjøen der ilandføringsplikten gjelder «reke», herunder også hvitreke, jf. utøvelsesforskriften § 48 første ledd nr. 3.
For å ta hensyn til næringens utfordringer med hensyn til bifangst av hvitreke mener Fiskeridirektoratet at regelverket i Skagerrak og Nordsjøen bør harmoniseres.

Fiskeridirektøren foreslår at ilandføringsplikten i Nordsjøen og Skagerrak skal gjelde for «Pandalus borealis».

4. FISKERIDIREKTORATETS REKESTRATEGI

Reguleringstiltakene som er lagt frem for Reguleringsmøtet er et ledd i en strategi for bedre forvaltning av rekebestandene i Nordsjøen og Skagerrak.

Strategien er lagt ved som vedlegg til saksdokumentene.

Vedlegg: Fiskeridirektoratets strategi for bedre forvaltning av rekebestandene i Nordsjøen og Skagerrak.

Afbout DNV GL

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