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MSC SUSTAINABLE FISHERIES CERTIFICATION

DFPO Denmark North Sea, Skagerrak & Kattegat hake



Public Comment Draft Report

July 2014

Prepared for: Danish Fishermen's Producer Organisation (DFPO)

Prepared by: Food Certification International Ltd



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Glossary of Terms

ASCOBANS	(Bonn Convention's) Agreement on the Conservation of Small Cetaceans in the Atlanto-Scandian and Baltic.
ACOM	ICES Advisory Committee
ACFA	ICES Advisory Committee on Fisheries and Aquaculture
B_{pa}	Precautionary reference point for spawning stock biomass
B_{lim}	Limit biomass reference point, below which recruitment is expected to be impaired.
CFP	Common Fisheries Policy
CR	Council Regulation
DFPO	Danish Fisherman's Producer Organisation
DTU Aqua	Danish Technical University – National Institute of Aquatic Resources
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened and protected species
EU	European Union
F	Fishing Mortality
F_{lim}	Limit reference point for fishing mortality that is expected to drive the stock to the biomass limit
F_{pa}	Precautionary reference point of fishing mortality expected to maintain the SSB at the precautionary reference point
FAM	MSC's Fisheries Assessment Methodology
HCR	Harvest Control Rule
ICES	International Council for the Exploration of the Sea
MCS	Monitoring, Control and Surveillance
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
NEA	North East Atlantic
NGO	Non-Governmental Organisation
OSPAR	Oslo-Paris Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)
P1	MSC Principle 1

P2	MSC Principle 2
P3	MSC Principle 3
PI	MSC Performance Indicator
PO	Producer Organisation
RAC	Regional Advisory Council
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
UoC	Unit of Certification – i.e. Definition of the fishery.
VMS	Vessel Monitoring System
VPA	Virtual Population Analysis
WWF	World Wide Fund For Nature
WGWISE	ICES Working Group on Widely Distributed Stocks

Fish and shellfish species mentioned in the report, English Danish and scientific names.

English	Danish	Latin
Anchovy	Ansjos	<i>Engraulis encrasicolus</i>
Basking shark	Brugde	<i>Cetorhinus maximus</i>
Blue ling	Byrkelange	<i>Molva byrkelange</i>
Blue Whiting	blåhvilling	<i>Micromesistius poutassou</i>
Brill	Slethvarre	<i>Scophthalmus rhombus</i>
Capelin	Lodde	<i>Mallotus villosu</i>
Wolffish	Havkat	<i>Anarhichas lupus</i>
Cod	Torsk	<i>Gadus morhua</i>
Conger eel	Havål	<i>Conger conger</i>
Dab	Ising	<i>Limanda limanda</i>
Edible crab	Taskekrabbe	<i>Cancer pagarus</i>
Lemon sole	Rødtunge	<i>Mocrostomus kitt</i>
Deep-sea prawn	Dybhavssreje	<i>Pandalus borealis</i>
Flounder	Skrubbe	<i>Platichthys flesus</i>
Greater forkbeard	Skælbrosme	<i>Phycis blennoides</i>
Greenland halibut	Hellefisk	<i>Reinhardtius hippoglossoides</i>
Grenadier - roundnose	Skolæst	<i>Coryphaenoides rupestris</i>

English	Danish	Latin
Grey Gurnard	Grå Knurhane	<i>Trigla gurnardus</i>
Grey Skate	skade	<i>Raja batis</i>
Haddock	Kuller	<i>Melanogrammus aeglefinus</i>
Hake	Kulmule	<i>Merluccius merluccius</i>
Halibut	Helleflynder	<i>Hippoglossus hippoglossus</i>
Herring	Sild	<i>Clupea harengus</i>
Horse Mackerel	Hestemakrel	<i>Trachurus trachurus</i>
Ling	Lange	<i>Molva molva</i>
Lumpsucker	Stenbider	<i>Cyclopterus lumpus</i>
Mackerel	Makrel	<i>Scomber scombrus</i>
Megrim	Galshvarre	<i>Lepidorhombus Whiff</i>
Anglerfish	Havtaske	<i>Lophius piscatorius</i>
Nephrops	Jomfruhummer	<i>Nephrops norvegicus</i>
Norway Pout	Sperling	<i>Trisopterus esmarki</i>
Pilchard	Sardin	<i>Sardina pilchardus</i>
Plaice	Rødspætte	<i>Pleuronectes platessa</i>
Pollack	Lyssej	<i>Pollachius pollachius</i>
Porbeagle shark	Sildehaj	<i>Lamna nasus</i>
Rabbit-fish	Havmus	<i>Chimaera monstrosa</i>
Ray spp	Rokke	<i>Rajidae</i>
Golden redfish	Stor rødfisk	<i>Sebastes marinus</i>
Redfish	Lille Rødfisk	<i>Sebastes viviparus</i>
Rough dab	Haising	<i>Hippoglossoides platessoides</i>
Saithe	Mørksej	<i>Pollachius virens</i>
Greater sandeel	Tobiskonge	<i>Ammodytes lancea</i>
Shore crab	Krabbe	<i>Carcaenus maenas</i>
Smaller cat-fish	Plette Havkat	<i>Anarhichas minor</i>
Sole	Tunge, Rødtunge	<i>Solea solea</i>
Sprat	Brisling	<i>Clupea sprattus</i>
Spurdog	Pighaj	<i>Squalus acanthias</i>
Squid;Cuttlefish	Blæksprutte; Akker	<i>Ommatostreephes todarus</i>
Spotted ray	Storplettet rokke	<i>Raja montagui</i>
Starry ray	Tærbe	<i>Raja radiata</i>
Sturgeon	Stør	<i>Acipenser sturio</i>
Thornback ray	Sømrøkke	<i>Raia clavata</i>
Tub gurnard	Rød Knurhane	<i>Trigla lucerna</i>
Turbot	Pighvarre	<i>Rhombus maximus</i>
Tusk	Brosme	<i>Brosme brosme</i>

English	Danish	Latin
Whiting	Hvilling	<i>Merlangius merlangus</i>
Witch	Skærising	<i>Glyptocephalus cynoglossus</i>

Summary

- » This report provides details of the MSC assessment process for **DFPO Denmark North Sea, Skagerrak & Kattegat hake** for Danish Fishermen's Producer Organisation (DFPO). The assessment process began in 31 January 2014 and was concluded (at a date to be determined).
- » A comprehensive programme of stakeholder consultations were carried out as part of this assessment, complemented by a full and thorough review of relevant literature and data sources.
- » A rigorous assessment of the wide-ranging MSC Principles and Criteria was undertaken by the assessment team and a detailed and fully referenced scoring rationale is provided in the assessment tree provided in **Appendix 3** of this report.
- » The assessment team for this fishery assessment originally comprised of Dr Antonio Hervás, who acted as team leader and Principle 1 specialist; Mr Nicholas James Pfeiffer who was responsible for evaluation of Principle 2 and Mr Andrew Read who was responsible for evaluation of Principle 3. Paul Macintyre was responsible for traceability / chain of custody considerations. Dr Mike Pawson acted as team leader and Principle 1 specialist and Don Aldous acted as Principle 3 specialist when the assessment resumed in late 2013, replacing the original team members.

Recommendation

On completion of the assessment and scoring process, the assessment team concluded that **DFPO North Sea Skagerrak and Kattegat hake fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.**

Client weaknesses

Principle 1

Performance indicators that failed to reach an unconditional pass mark (i.e. 80) are:

Reference points PI 1.1.2: The reference points used by management are no longer appropriate. The development of a new long term management plan should ensure that reference points are defined consistently with MSY.

Harvest Control Rules PI 1.2.2: Well defined control rules that ensure that exploitation rates are reduced as the limit reference points is approach are not in place.

Principle 2

The Demersal Trawl fleet is composed of two fleet groups; TR1 and TR2. TR1 is defined as demersal trawl with mesh size greater or equal than 100mm. TR2 is defined as demersal trawl with mesh size greater or equal than 70mm and smaller than 100mm.

The trawl Units of Certification scored below 80 in the main retained species component of Principle 2:

- » Retained Species Outcome Status (PI 2.1.1): For Nephrops in TR2, ICES states that the state of the North Sea stock is unknown, and it is not highly likely that the stock is within biologically based limits.
- » Retained Species Management Strategy (PI 2.1.2): Anglerfish is a main retained species in the demersal trawl fishery. Both in TR1 and TR2. For Anglerfish in the Skagerrak no quotas are set. This leads to the conclusion that there is no strategy in place to ensure the fishery does not pose a risk of serious or irreversible harm to the Anglerfish stock in the Skagerrak.

The Long-line and Set Net Units of Certification scored below 80 in relation to the information available on bycatch (PI 2.2.3).

- » Discard observer trips have been carried out in the past for the set net fishery. From 2004 to 2008 only two observer trips have been carried out and for the years after 2008 no data have

been provided. For the long line fishery discard observer trips have not been carried out yet. Therefore at the present time it is unclear whether the discard observer trips will be continued for the set net fishery and are planned for the long line fishery. It is therefore deemed uncertain whether any increases in risk to main bycatch species would be detected

All gear types scored below 80 in ETP management strategy (PI 2.3.2 - with the exception of long-line) and ETP information (PI 2.3.3).

- » Landings data for Danish demersal trawlers clearly indicate that common skate and particularly spurdog are caught and landed in association with the trawl fishery in the North Sea and Skagerrak. EC regulation 43/2009 (which came into force in January 2009 prohibits the landing of common skate by EU vessels. In addition EC regulation 57/2011 also stresses this ban for common skate and further sets a zero TAC for spurdog. There is no allowance for landing of spurdog as an incidental bycatch as in the previous year up to 10% of the last Danish spurdog quota. While it is not possible to determine if these landings are specifically related to the fishery, it is expected to be so. It is acknowledged that landings of spurdog captured in the Norwegian sector may still be legally landed. There is uncertainty with respect to recent levels of interaction and bycatch of harbour porpoise in setnet fisheries. There is clear potential for the fishery to interact with cetaceans and seals and there is uncertainty as to whether the total bycatch of harbour porpoise in all fisheries in the North Sea (including Skagerrak) is within acceptable limits as set by OSPAR (1.7% of best available population estimate).
- » It has not been possible to state that all elements of the strategy are being implemented successfully as landings data provided do not reveal the area of capture for Spurdog landings, while landings of skate are not yet reported by species. There is uncertainty about the present day bycatch of Harbour porpoise in the setnet fishery. Due to uncertainty with respect to bycatch levels, it is not possible to evaluate the management response or appropriateness of measures. In addition, until such time as landings of Spurdog are completely eliminated or area of capture is provided for landings and skate is reported by species (with no common skate landed) it will not be possible to award the final scoring guide at SG80.
- » Data in relation to ETP interaction falls short of being comprehensive. The fleet must fully implement appropriate recording of all interactions with ETP as defined in this report and should proactively commence full recording and reporting. Data is essential to effective management response to the issue of ETP interaction. Present data availability does not adequately support management

Demersal Trawl (both TR1 and TR2) scored below 80 in habitat outcome status (PI 2.4.1) and habitat management strategy (PI 2.4.2).

- » Trawling has scope to adversely impact seabed habitats and communities. There is incomplete data with respect to the distribution of sensitive seabed habitats and communities in the area fished, although it is considered unlikely (based on available evidence) that there are extensive areas of either within the areas where the fishery takes place. Despite this the fishery should demonstrate clearly which habitat types may be affected by the fishery. Because of the likelihood that trawling may cause damage to certain seabed habitats and communities, it is appropriate that this aspect of the fishery be better informed and managed so as that impacts can be limited

1. Introduction

This report details the background, justification and results of Food Certification International (FCI) Ltd's assessment of the **DFPO Denmark North Sea, Skagerrak & Kattegat hake** fishery, carried out by FCI to the standard of the Marine Stewardship Council (MSC) Sustainable Fisheries Programme.

Scope

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

In order to provide useful background and information for a wider readership it is also useful to provide a more qualitative account of the fishery in question. However, it should be reiterated that although the assessment is *evidence based*, no primary research has been undertaken to inform this report. Instead the assessment relies on the information placed before the assessment team by the client, key relevant stakeholders identified by the assessment team, and any other stakeholders who wish to participate in the process.

Whilst this report is not intended to comply with the standard editing norms expected for scientific journals, it should be sufficiently clear and unambiguous to be reviewed by fisheries specialists, whilst remaining sufficiently accessible to provide insight for interested readers throughout the supply chain – including consumers.

1.2 Report Structure

Early report sections provide the reader with an understanding of the nature of the fishery and the issues debated by the team when scoring the fishery. This begins with a description of the unit of certification, before expanding to outline some further background information, including details of the Danish Fishermen's Producer Organisation (DFPO) Danish Fishermen's Producer Organisation (DFPO), the fleet, fishing operations and gear and the species itself.

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

- » **Principle 1:** Target stock status and harvest controls (summarised in **Section 3**)
- » **Principle 2:** Wider impacts of fishery operations on the environment (summarised in **Section 4**)
- » **Principle 3:** The management system (summarised in **Section 5**)

Later sections of the report explain the procedures used to score the fishery, give details of the assessment team and present the outcome of the team's deliberations. Finally the report provides a statement of the team's recommendations as to whether or not this fishery should go forward for certification to the standard of the Marine Stewardship Council, together with any conditions recommended.

1.3 Inspections & Consultations

The full assessment process began in January 2011 with the initial information gathering stage and client preparation of relevant documentation. In March 2011 members of the assessment team, supported by an FCI staff member, undertook a site visit to Denmark. This enabled a scheduled programme of consultations to take place with key stakeholders in the fishery – including skippers, scientists, fishery protection officers, NGOs, fishery managers and technical support staff. Prior

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

notification of this site visit was issued on the MSC website in order that all relevant stakeholders were aware of the opportunity to meet with the assessment team.

A complete list of those stakeholders interviewed in the fishery can be found in **Section 6.3** of this report.

The scoring of the fishery against the MSC Principles and Criteria originally took place in August 2011, when it was determined that the information available to score Principle 1 was inadequate, in view of ICES' inability to carry out a satisfactory assessment of stock status at that time. Further scientific investigation through 2012 resulted in a change in assessment methodology and adoption of some new biological parameters, which allowed ICES to provide robust advice on Northern hake stock status in June 2013. The fishery was rescored between December 2013 and April 2014 taking account of new catch information for 2010 - 2012.

2. The Fishery

2.1 The Units of Certification

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

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

The fishery assessed for MSC certification contains four UoCs, defined as:

Table 1: Units of Certification

Species:	Hake (<i>Merluccius merluccius</i>)
Stock:	European Northern hake
Geographical area:	ICES Subarea IV (North Sea) and Division IIIa West (Skagerrak)
Harvest method:	Demersal trawl TR2 cod-end mesh less than 100 mm (including Scottish Seine)
Client Group:	DFPO registered vessels targeting the European Northern hake stock that have signed up to and fulfill the requirements of the DFPO Code of Conduct.
Other Eligible Fishers:	Vessels that are members of Danish POs, targeting the European Northern hake stock, which are not currently DFPO registered.

Species:	Hake (<i>Merluccius merluccius</i>)
Stock:	European Northern hake
Geographical area:	ICES Subarea IV (North Sea) and Division IIIa West (Skagerrak)
Harvest method:	Demersal trawl TR1 cod-end mesh greater than or equal to 100 mm (including Scottish Seine)
Client Group:	DFPO registered vessels targeting the European Northern hake stock that have signed up to and fulfill the requirements of the DFPO Code of Conduct.
Other Eligible Fishers:	Vessels that are members of Danish POs, targeting the European Northern hake stock, which are not currently DFPO registered.

Species:	Hake (<i>Merluccius merluccius</i>)
Stock:	European Northern hake
Geographical area:	ICES Subarea IV (North Sea) and Division IIIa West (Skagerrak)
Harvest method:	Danish Seine
Client Group:	DFPO registered vessels targeting the European Northern hake stock that have signed up to and fulfill the requirements of the DFPO Code of Conduct.
Other Eligible Fishers:	Vessels that are members of Danish POs, targeting the North Sea European Northern hake stock, which are not currently DFPO registered.

Please note: The Longline Unit of Certification has since been removed from the assessment following the granting of a variation by the MSC.

Species:	Hake (<i>Merluccius merluccius</i>)
Stock:	European Northern hake
Geographical area:	ICES Subarea IV (North Sea) and Division IIIa West (Skagerrak)
Harvest method:	Longline
Client Group:	DFPO registered vessels targeting the European Northern hake stock that have signed up to and fulfill the requirements of the DFPO Code of Conduct.
Other Eligible Fishers:	Vessels that are members of Danish POs, targeting the European Northern hake stock, which are not currently DFPO registered.

Species:	Hake (<i>Merluccius merluccius</i>)
Stock:	European Northern hake
Geographical area:	ICES Subarea IV (North Sea) and Division IIIa West (Skagerrak)
Harvest method:	Set Nets (Gill and Trammel)
Client Group:	DFPO registered vessels targeting the European Northern hake stock that have signed up to and fulfill the requirements of the DFPO Code of Conduct.
Other Eligible Fishers:	Vessels that are members of Danish POs, targeting the European Northern hake stock, which are not currently DFPO registered.

2.1.1 Rationale for Using Unit of Certification

These Units of Certification were used as they are compliant with client wishes for assessment coverage and in full conformity with MSC criteria for setting the Unit of Certification.

2.2 Danish Fishermen's Producer Organisation (DFPO)

2.2.1 Organisational Structure

The Danish Fishermen's Producers Organisation (DFPO) obtained official recognition as an EU Producers Organisation (PO) in 1974, with the overarching objective of creating a balance between supply and demand in the market place for species to which minimum prices are applied under EU regulations. The DFPO also oversees the withdrawal of fish from market in circumstances where landings are unable to obtain minimum withdrawal prices. Hake is one of the species that fall within the EU minimum price scheme along with the other main commercial species landed by the EU fleet.

European Union regulations establish a common market for fishery products, making it possible, in the interests of producers and consumers, for Producer Organisations to stabilise prices, balance supply and demand and ensure adequate supplies to a market.

Council Regulation (EC) No 104/2000 of 17 December 1999 on the common organisation of the markets in fishery and aquaculture products.

DFPO members land approximately 60-65 % of the total Danish catches of these species. All active Danish vessels are eligible for membership of the DFPO. Members pay a landings levy to the DFPO for all landings of relevant species and, in return, the DFPO offers a safety-net in the form of guaranteed minimum payments if members cannot sell their fish at the minimum prices stipulated by the EU. The members are then entitled to receive a guarantee payment or refund, which is generally at the same level as the withdrawal price itself.

The DFPO is structured as follows:

- » **Members Council:** responsible for statute changes, election of chairman and board, and outlining official policy in relevant fields of responsibility.
- » **Chairman and board:** responsible for setting minimum prices (regulations permit EC guide prices to be altered within +/- 10 %, according to current market situation). The board also fixes the level of guaranteed payment to members in case of withdrawals from the market.
- » **Secretariat:** 21 employees (common with the Danish Fishermen's Association (DFA)), including a 1 DFPO chairman (and 1 DFA chair plus 2 vice-chairs), and responsible for all administrative matters.

DFPO cooperates closely with the Danish Fishermen's Association on most matters related to fishing, nationally as well as internationally. DFPO also represents its members on a number of committees under the Danish Ministry of Food, Agriculture and Fishing. DFPO is also a member of the EAPO (European Association of Producers Organisations). In addition the DFPO also undertakes some business operations such as the production, and the leasing out of cold storage facilities to members primarily located in the smaller fishing ports. Unlike some other European Producer Organisations, the DFPO do not play any role in holding vessel quota, monitoring uptake or undertaking quota trading.

2.2.2 DFPO Code of Conduct

The code of conduct was first formally adopted by the DFPO in June 2008 and outlines the practices to meet the goals for sustainable and responsible behaviour in Danish fisheries. Sustainability and minimising environmental impact are the main objectives and, although fleet financial performance is not mentioned directly, there is a clear recognition that economic sustainability (profitability) is a vital pre-requisite of more environmental and economic sustainability. In this respect, the code includes elements in relation to areas likely to benefit vessel financial performance, such as catch handling and quality of the landings.

Since then, and as part of the MSC assessment process, the DFPO have added to and enhanced their existing members Code of Conduct to more accurately reflect that sustainability goals outlined in the MSC Principles and Criteria. This now includes additional recording commitments to collate relevant data to enable further management refinement. **Signing up to, and continued compliance with this Code of Conduct (including submitting relevant data records) will be a pre-requisite requirement of inclusion on the MSC certificate, and will be monitored and enforced by the DFPO.** A summary of the DFPO expanded Code of Conduct is provided in Figure 2.1.

For chain of custody purposes, the DFPO will keep an updated list of vessels that have signed up to this Code of Conduct and are recording relevant data and are, therefore, eligible to land hake in accordance with this certification. A register of vessels is maintained at www.msc-fiskere.dk. In time, this site will be linked to the electronic traceability system the DFPO are currently building so that buyers will not have to perform a separate check.

Upon signature of the Code of Conduct a vessel will be sent:

- » Recording sheets for relevant data on fishery interactions. This contains details of exactly what interactions to record (bycatch species, relevant ETP species, habitat interactions) and in what format the data should be recorded (weight, time, location etc.).

- » Reporting instructions / requirements.
- » A 'Wheelhouse-guide to protected species'. This will list all relevant ETP species and will contain images and identification tricks for difficult-to-identify species such as skates and rays, produced in collaboration with the experts at the Natural History Museum of Denmark.

Although some areas of the Code of Conduct are purely commitments to good practice, there are specific reporting requirements that can and will be monitored and enforced by the DFPO. All vessels that have signed up to the Code of Conduct and who are eligible to sell their product as MSC certified are required to submit quarterly data reports to the DFPO (either directly or through their local Fishermen's Association).

A vessel which does not comply with the operational procedures in the Code of Conduct, or who fails to submit the requisite data in the appropriate form, will be contacted directly by DFPO staff and issued with a warning. Continued non-compliance will result in loss of the right of use of the MSC certificates for one year.

Additionally, any vessel that is successfully prosecuted for a fisheries violation that has material consequences for the sustainability of the fishery, on more than 1 occasion over a two-year period, will lose the right to use MSC certificates for one year and be removed from the vessel register.

Fig 2.1: Summary of some of the key relevant elements of the DFPO code of conduct.

Minimise unwanted catches and discards:	Minimise the environmental impact of fishing:
<ul style="list-style-type: none"> ✓ No high-grading ✓ Fish in areas and at times with the lowest presence of unwanted species. ✓ Clear & open fleet communication regarding areas of undersized fish or unwanted species. ✓ Use and continue to develop selective gear for effective fishery. ✓ Efficient and appropriate use vessel quota-pools opportunities for rental, exchange etc. to adjust vessel quota to actual catches. 	<ul style="list-style-type: none"> ✓ Minimise fuel use and by use cleanest available fuel. ✓ Develop gear which minimises the harmful effects on the environment. ✓ Bring in-organic waste ashore – including waste caught in gear. ✓ Dispose of oil and other potentially environmentally damaging substances in designated harbour facilities of. ✓ Notify SOK (the Danish Navy operations centre responsible for pollution surveillance) whenever pollution encountered at sea. ✓ Recover lost fishing-gear, assisting fellow vessels and recording lost gear where recovery is not possible.
Avoid capture of marine mammals and other endangered or protected species.	Open collaboration with other stakeholders:
<ul style="list-style-type: none"> ✓ The relevant species, and how to identify and record them, are described in a 'Wheelhouse-guide to protected species'. ✓ Record any capture events and if still alive, return to the sea as quickly and carefully as possible. ✓ Collected, aggregate and monitor data and pass to relevant scientific institutions for analysis. ✓ Use year 1 analysis to adopt DFPO plan to reduce impact (through guides, rules, research etc.), prioritising fisheries, species, seasons and areas with greatest interaction. ✓ The plan will be evaluated and adjusted annually after each new year of monitoring. 	<ul style="list-style-type: none"> ✓ With authorities and politicians on the development of policies and management. ✓ With researchers on the development of knowledge and data collection. ✓ With the control and monitoring agency on e.g. developing better logbooks and control strategies. ✓ With organisations in and around the fisheries' sector. ✓ With environmental NGOs on e.g. common advice to The European Commission. ✓ Welcome observers onboard DFPO vessels.
Safeguard crews	Transparent information, traceability & quality
<ul style="list-style-type: none"> ✓ Ensure safety and good conditions for the crew at sea ✓ Ensure the continued appropriate education of our crew. ✓ Educate fishermen on interactions between fishing, fish stocks and their environment. 	<ul style="list-style-type: none"> ✓ Ensure correct and hygienic handling of catches. ✓ Disponibility of a system to monitor vessels geographical position by satellite (vessel monitoring system, VMS) and track catches with electronic logbooks. ✓ An advanced system of electronically traceable fish-boxes and electronic traceability from catch to consumer

2.3 Fishing Fleet & Fishing Method

All certified vessels are Danish registered, members of the DFPO and have signed up to the DFPO Code of Conduct. There are four different gear types covered in this assessment report; demersal trawl, Danish seine, set net (trammel & gill net) and longline. Details of each are set out below. The link to the client vessel list is: www.danish-msc-fisheries.dk/MSCvessels

2.3.1 Demersal Otter Trawl

The demersal otter trawl (single, twin and pair) is a towed fishing gear designed and rigged to have bottom contact during fishing, and is used by large trawl vessels, typically in excess of 15m. A demersal trawl is a cone-shaped net consisting of a body, closed by a codend and with lateral wings extending forward from the opening. The two towing warps lead from the vessel to the otter boards which act as paravanes to maintain the horizontal net opening. These boards typically weigh between 0.5–2 t and drag across the seabed (with potential to disrupt seabed structure and habitat). The boards are joined

to the wing-end by the bridles that herd fish into the path of the net. The net opening is framed by a floating headline and ground gear designed according to the bottom condition to maximise the capture of demersal target species, whilst protecting the gear from damage. On very rough substrates special rock-hopper gears are used.

Two fleet groups are distinguished within the otter trawl fleet:

- » TR1 Group: Demersal trawls using mesh size greater or equal than 100mm
- » TR2 Group: Demersal trawls using mesh size between 70 mm and 100mm

Instruments to monitor gear performance are common in modern bottom otter trawling. Such instruments monitor geometry (door-to-door distance, vertical opening, bottom contact, trawl symmetry), trawl depth and water temperature, and the weight of catch in the trawl is also monitored to give an indication of the appropriate moment to haul.

Since the EU-Norway deal concluded in 2012, the only gears allowed in the demersal fisheries in the Skagerrak from 1 February 2013 are:

- » 120 mm (=TR 1) for roundfish/flatfish fisheries,
- » a 90 mm trawl with the Swedish grid for pure Nephrops fisheries (only relevant in the Swedish near-shore fisheries, so not used by Danish fishermen) and
- » the SELTRA trawl for the mixed Nephrops/roundfish fisheries (which the Danish fishermen have opted for, along with an increased use of TR 1).

The SELTRA trawl is a four panel 90 mm bag with a 3 m long 270 mm diamond mesh/140 mm square mesh exit window on the top panel, set 4 m in front of the cod end. This net has been designed specifically by DTU Aqua to be as size selective for juvenile roundfish (cod, haddock, saithe, hake etc.) as a TR 1 trawl – but to be able to retain Nephrops, which the TR1 does not do very well.

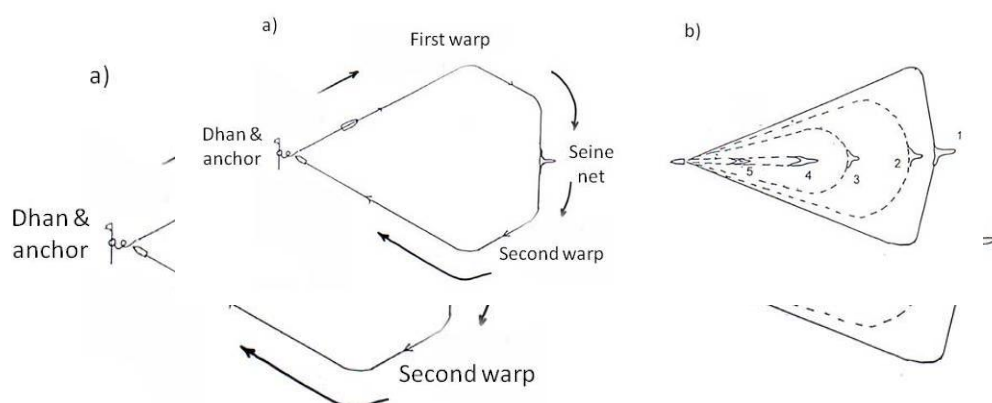
2.3.2 Danish Seine

The Danish Seine, or anchor seine, is a method for demersal fishing where the warps and net (conical net with two long wings) are laid out from an anchored dhan buoy. In order to surround the proposed fishing ground, the vessel steams a roughly triangular shaped course, firstly away from the dhan to one side of the ground paying out the first warp as it steams. The vessel then pays out net whilst passing astern of the fishing ground, and finally returning to the dhan whilst paying out a second length of warp. The vessel then returns to the dhan buoy and secures to the anchor cable, in order to keep the vessel stationary whilst hauling.

Hauling of the net is slow at first, with the two net warps herding fish towards the path of the net as they close. As hauling proceeds, winch speed increases and the net begins to move in the direction of tow, with the lateral wings of the net increasingly acting to herd the fish. When the ropes are nearly closed, haul speed increases again to capture the remaining fish in the net's path. Finally the net is brought alongside the ship (or ships stern depending on vessel configuration) to allow the cod end to be craned / winched aboard and emptied.

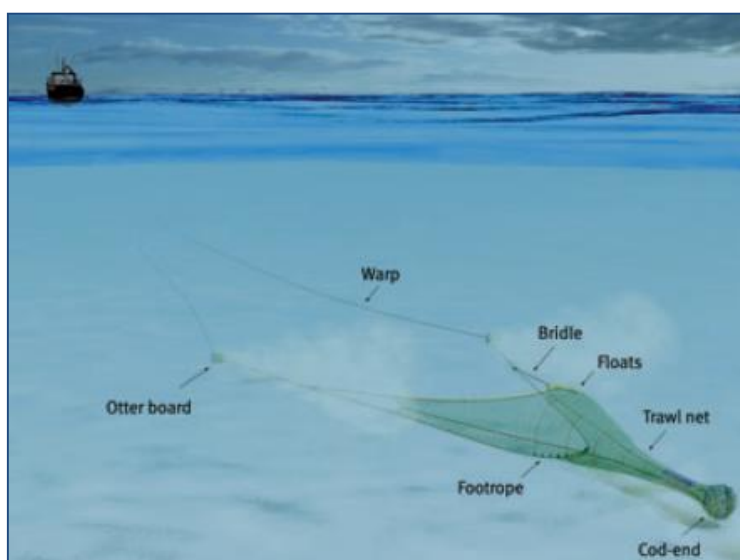
Although Danish seine gear is generally lighter than trawl gear, with neither heavy trawl doors nor clump weight, the gear is robust and strong to withstand abrasion over the seabed. The seine nets are generally made up from the same twisted polyethylene twines used by the demersal trawl fleet, with a weighted ground rope which may be supplemented by light rubber discs or bobbins for rougher ground.

Fig 2.2: Typical Danish Seining setting (a) and hauling (b) process



Data source: FAO Gear type Factsheet

Figure 2.3: Gear configuration for demersal trawl



Source: Galbraith & Rice 2004, Data source: FAO Gear type Factsheet

2.3.3 Trammel Net & Gill Net

Another fishing method employed in this fishery is a bottom set gill net with vessels specially designed for static gear operations. Most large set net vessels have a net hauler on the forward starboard quarter and sufficient deck space for sorting and storing the nets and the catch, which is facilitated by a covered shelter deck.

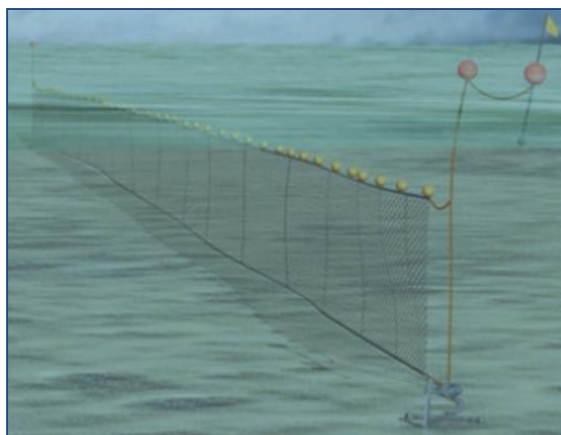
The vessels make use of two different types of bottom-set net, both of which are covered within this Unit of Certification; namely gill net and trammel net.

Gill net is the set net generally used to target hake. A gill net consists of a single netting wall kept more or less vertical by a float line and a weighted ground line. The net is set on the bottom, and kept stationary by anchors on both ends and at 50m intervals. A gill net mesh size is chosen to allow the

targeted size of fish to become wedged and not pass through. In this case, each net is approximately 3m high (from the seabed) and 50m long with a monofilament mesh size of typically 190mm (stretched mesh, knot to opposite knot). Up to 100 lengths of nets may be joined together and worked as a single net of up to several km in length. Vessels in this fleet typically carry enough net to make 3 lines parallel lines of net, around 500m apart – these are then relatively easy to patrol, to ensure other vessels (particularly those using towed gears) do not foul the gear.

The fishing properties of static nets are a function of several parameters relating to the net including the mesh size, number and thickness of filaments making up the twine (monofilament v. multifilament), hanging ratio – the number of meshes mounted per unit length of head/footrope, mesh colour as well as physical dimensions in terms of length and net height (measured in meshes). Gill net fishing for hake occurs at depth of 40-150 m.

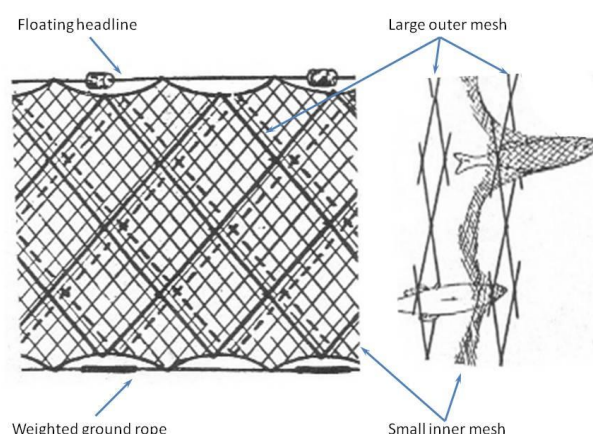
Fig 2.4: Diagram of typical gill net configuration



Source: Galbraith & Rice 2004

Trammel nets are less used than gill nets to target hake. The trammel net used by this fleet is a triple mesh net, anchored to the seabed with a total height of around 1.5m. The inner net essentially acts as a gill net, with a mesh size typically of 150mm, and is sandwiched between 2 outer mesh layers (armouring) of 350mm mesh size. By having an inner panel of small mesh netting, loosely hung between the two outer panels of large mesh netting, a fish that would not normally become enmeshed in the inner net pushes it through the large mesh, forming a pocket in which it is trapped.

Fig 2.5: Typical trammel net configuration



Data source: FAO Gear type Factsheet

Both gill nets and trammel nets are set before dusk, generally parallel to the tide, and are usually left in the water overnight and hauled next day. Occasionally nets may have a longer soak time, for example as a result of bad weather, but this is to be avoided as the catch quickly deteriorates, and crabs quickly destroy the trapped fish and are time consuming to remove from the net. Due to the nature of the gear

and vessel and crew ability to work the gear, nets are only shot or hauled in wind speeds up to about 20 m/s (Beaufort force 6).

Although weighted and anchored, the nets are relatively light and can be flattened by the tide so they are not normally set during spring tides – in particular in regions of highest current (in the south of the fishing region). Nets are marked by Dhan buoys with the vessel identification and radar reflector.

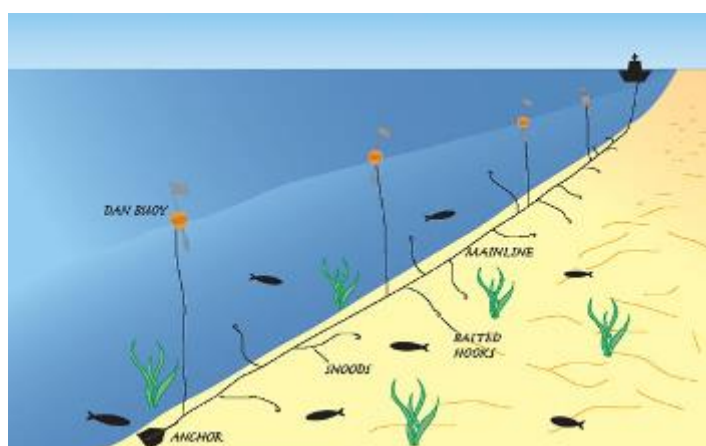
Although the gill net fishing season is year round, due to the nature of the gear and the fishing characteristics of the net, there are far higher landings during the summer months.

2.3.4 Longline

Please note: The Longline Unit of Certification has since been removed from the assessment following the granting of a variation by the MSC.

Longline fishing is a method consisting of a long line onto which snoods are fixed at regular intervals (usually every 2-2.5 m) to which baited hooks are attached (approximately 250 hooks per line and about 12-16 lines per vessel). Hake longline fishing uses squid and herring (approximately 10-30 kg per day) as bait. Longline gear is deployed at 35-60 m depth and is marked by Dhan buoys with vessel identification and radar reflectors. The fishing fleet comprises small vessels that fish 20-30 nautical miles from port from which they leave and arrive on the same day.

Both squid and herring are 10-30 kg per day (not 10-130 kg).



Source: <http://www.afma.gov.au/information/students/methods/pelagic.htm>

2.4 Target species

The target species for the fishery under certification is the European hake *Merluccius merluccius*. This report does not intend to provide a scientifically comprehensive description of the species, but the following sources have been used to compile a summary description of the species:

- » ICES, 2010. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Anglerfish and Megrin (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11
- » ICES, 2013. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

2.5 Evaluation Area

2.5.1 Stock geographic distribution.

European hake is widely distributed over the Northeast Atlantic shelf. Two stocks are distinguished for management purposes: is managed and assessed as two separate stocks in the ICES area: the so-

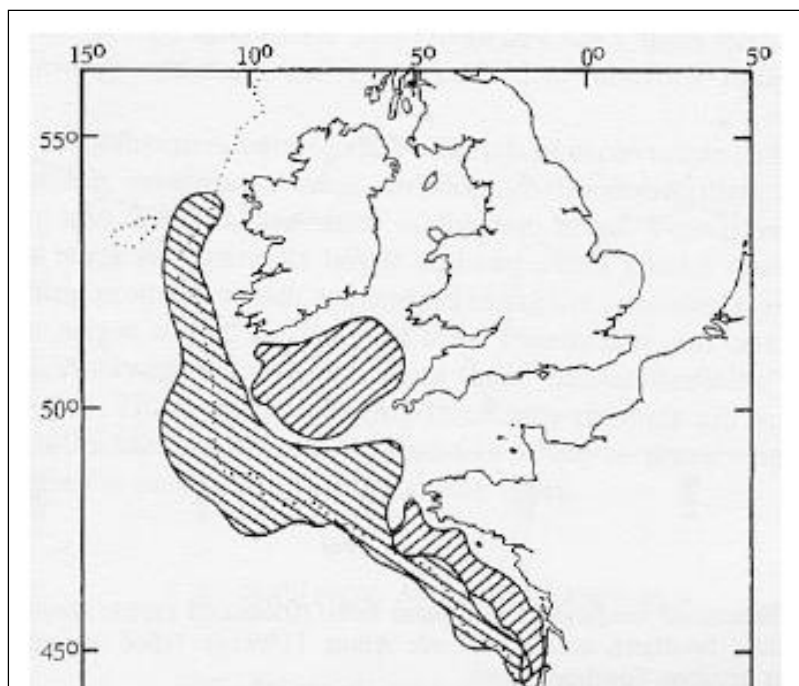
called northern stock, in Divisions IIIa, Subareas IV, VI and VII and Divisions VIIIa, b, d, and the southern stock in Divisions VIIIc and IXa along the Spanish and Portuguese coasts. There is no biological basis for the current ICES definition of northern and southern hake stocks, which have similar biology with an unknown degree of mixing. Although there is no evidence of populations, structuring throughout the combined areas, the Cap Breton canyon (close to the border between the Southern part of Division VIIIb and the eastern part of Division VIIIc) could be considered as a geographical boundary between the southern and the northern stocks.

2.5.2 Life cycle

European hake spawn from February to July along the shelf edge, mainly from the north of the Bay of Biscay to the south and west of Ireland (Figure 2.6). Following the pelagic life phase, juvenile hake descend to near the sea bed in depths of more than 200m, then move to shallower water with a muddy seabed (75-120m) by September of their first year. The main nursery grounds are located in the Bay of Biscay and off southern Ireland (Figure 2.6). Maturity (L50) is estimated (for both sexes combined) at around 43 cm.

Estimation of growth rates is currently the most relevant aspect regarding the understanding of hake population dynamics. Recent research through tagging studies has demonstrated that growth parameters estimated using otolith-based age methods are not accurate, and this has caused a shift in the stock assessment methodology used by ICES (see section 3). Tagging results have shown that hake growth has been underestimated by a factor of 2, meaning that the age at first maturity is earlier and life span of this species is shorter than previously believed.

Figure 2.5. The main spawning (sloping downwards from left to right) and nursery areas (sloping downwards from right to left) of northern hake.



Source: Casey and Pereiro, 1995 in: ICES WGHMM 2010

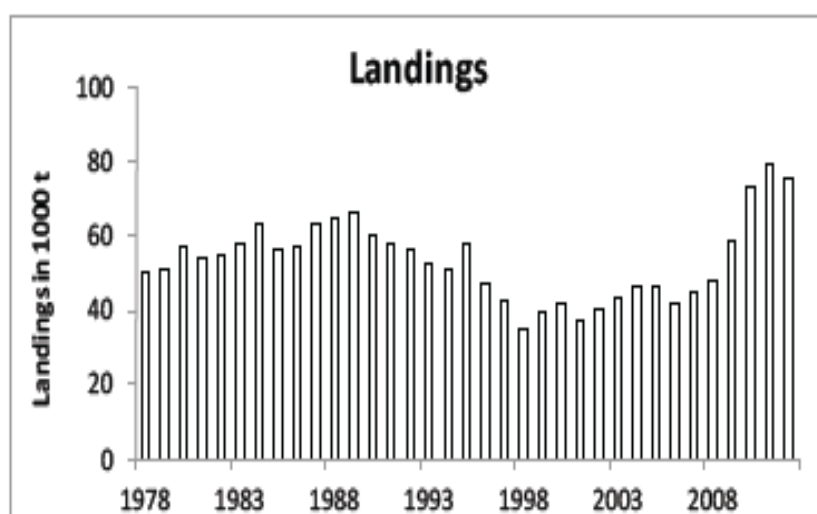
2.6 Catches & Landings

2.6.1 Landing patterns and trends

Total landings of Northern hake, by fleets of all nationalities and all ICES subdivisions, were approximately 60,000 t in 2009. Historic landings estimates are presented in Figure 2.6. Landings increased from 50,000t in the late 1970s to 66,500 t in the late 1980s. A steep decrease in landings was experienced through the 1990s, when the lowest level of landings was recorded in 1998. Landings in the next decade remained constant between 40 and 50 thousand t, increasing from 2008 to a peak of almost 80,000 t in 2011 and 75,200 t in 2012.

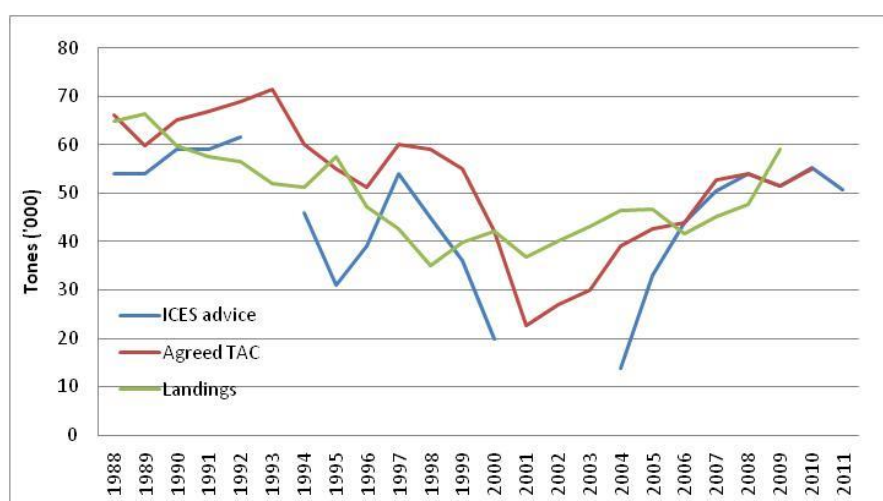
Historically, official landings have been higher than the agreed TAC (Figure 2.7) and the TAC has been set higher than scientific advice. This pattern in contributed significantly to the unsustainable exploitation of the stock until the introduction of the recovery plan in 2004, since when the discrepancy between ICES advice, agreed TAC and landings has decreased significantly (Figure 2.7).

Figure 2.6. ICES estimates of hake landings in Division IIIa, Subareas IV, and VII and Divisions VIIIa,b,d



Source: ICES WGHMM 2013

Figure 2.7. Comparison between ICES advice, agreed TAC and landings of northern hake. Gaps in ICES advice data correspond to years with no advice.



Source: ICES WGHMM 2010

A set of different Fishery Units (FU) has been defined by the ICES Working Group on Fisheries Units in Sub-areas VII and VIII in 1985, in order to study the fishing activity related to demersal species (ICES, 2011). To take into account the hake catches from other areas, a new Fishery Unit was introduced at the beginning of the nineties (FU 16: Outsiders). This Fishery Unit was created on the basis of combination between mixed areas and mixed gears (trawl, seine, longline, and gillnet). The current FUs are defined in Table 2.1 (the fishery under assessment belong to FU 16).

The main part of the fishery is currently conducted in six Fishery Units, three of them from Subarea VII: FU 4, FU 1 and FU 3, two from Subarea VIII: FU 13 and FU 14 and one in Subareas IIIa, IV, V and VI : FU16 which correspond to the Danish fleet.

Table 2.1. Description of Northern Hake Fishery Units (FU)

Fishery Unit	Description	Sub-area
FU1	Long-line in medium to deep water	VII
FU2	Long-line in shallow water	VII
FU3	Gillnets	VII
FU4	Non-Nephrops trawling in medium to deep water	VII
FU5	Non-Nephrops trawling in shallow water	VII
FU6	Beam trawling in shallow water	VII
FU8	Nephrops trawling in medium to deep water	VII
FU9	Nephrops trawling in shallow to medium water	VIII
FU10	Trawling in shallow to medium water	VIII
FU12	Long-line in medium to deep water	VIII
FU13	Gillnets in shallow to medium water	VIII
FU14	Trawling in medium to deep water	VIII
FU15	Miscellaneous	VII & VIII
FU16	Outsiders	IIIa, IV, V & VI

Source: WHMM 2011

3. Target Stock Status & Harvest Controls (P1)

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.

Principle 1 covers all fishing activity on the entire target species stock - not just the fishery undergoing certification. However, the fishery under certification would be expected to meet all management requirements, such as providing appropriate data and complying with controls, and demonstrably not adding to problems even if the problems will not cause the certification to fail. The key factors that are relevant to Principle 1 are outlined in the following section.

3.1 Status of the Stock & Reference Points

The MSC assessment methodology requires the stock status to be assessed in relation to the reference points used for management of the fishery. A sustainable stock status is defined as a stock reaching a biomass level that maintains high productivity and has low probability of recruitment overfishing. Stock status is measured against the reference points set by management (FAM v2). Reference points are assessed for their appropriateness in terms of the stock achieving high productivity levels and avoiding recruitment overfishing.

The MSC assessment methodology would have been easy to apply to the northern hake fishery until the ICES advice for the management of the stock in year 2011 was produced (ICES 2010 advice). Prior to ICES 2010 advice stock biomass and fishing mortality rates were estimated and stock status was defined in relation to the reference points used by management that were defined by the ICES working group following the precautionary approach (ICES advice 2009).

However, in 2010, as a result of a review carried out by ICES on the stock assessment methodology of the Northern hake, the assessment model shifted from an age-based approach to a length-based model. This shift in assessment methodology had significant consequences in terms of defining stock status, which can be summarised as follow:

- » The shift in stock assessment methodology changed the perception of historic stock trends, with the absolute levels of SSB, fishing mortality and recruitment having shifted to different levels.
- » As a result of the above, the reference points contained within the hake recovery plan were no longer appropriate and need to be re-calculated
- » Under the length-based assessment current population parameters (i.e. biomass, mortality rates and recruitment rates) could not be provided due to: (1) the modelled time period, 1990-2009, does not exhibit strong contrast in the available data and (2) little information is available on large fish from the trawl fishery (larger than 60 cm). Therefore, ICES considered that the assessment of the stock status was indicative of trends only.

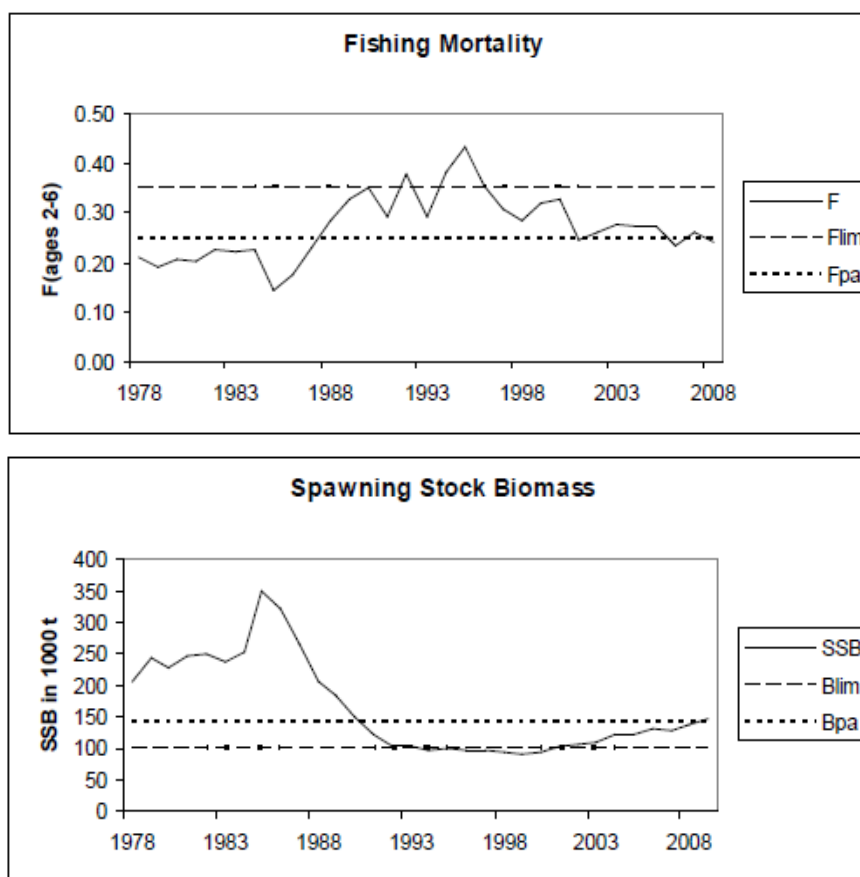
Following harmonisation with the parallel assessment of the Cornish gill net hake fishery, it was decided that Principle 1 could not be evaluated by taking into account only the stock assessment and fishery management practices applied since the introduction of the hake recovery plan and prior to 2010 (EC Reg. No 811/2004). Whilst ICES' advice provided for the management of the stock takes into account the position of the stock in relation to the reference points set by the current management plan, the shift in assessment methodology in 2010 and its consequences for stock status and management should be reflected in the scoring of the fishery and condition of certification. It was agreed that the MSC assessment process for both fisheries would be held in abeyance until such a time as ICES was able to offer more certain advice on northern hake stock status and management.

The northern hake stock status

Stock status& reference points using an age-based assessment (as of 2009)

ICES advice in 2009 was that Northern hake had full reproductive capacity ($SSB_{2009} > B_{pa}$), had been harvested sustainably in relation to precautionary limits since 2001 ($F_{2001-2008} \sim F_{pa}$) and that there was a low risk of stock depletion, though it was overfished in relation to high long-term yields. Recruitment had been stable over the last decade.

Figure 3.1. Summary of stock assessment of hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa,b,d



Source: ICES 2009

The reference points (Table 3.1) were defined following the precautionary approach to fisheries management (ICES, 1998). The limit biomass reference point (B_{lim}) is defined as the lowest SSB observed below which recruitment became impaired or the dynamic of the stock is unknown, whilst the limit fishing mortality-based reference points (F_{lim}) is defined as the fishing mortality that drives the stock to B_{lim} . The precautionary biomass reference point (B_{pa}) is defined as the SSB level at which there should be a high probability that the stock will be above B_{lim} . Similarly, F_{pa} is estimated as the fishing mortality that will ensure a high probability of being below F_{lim} .

Table 3.1. Reference points used under the 2004 recovery plan

Type	Value	Technical Basis
Blim	100,000 t	Blim = Bloss (Biomass 1994)
Bpa	140,000 t	$B_{pa} \sim B_{lim} * \exp(1.645 * 0.2)$
Flim	0.35	Flim = Floss

Type	Value	Technical Basis
F _{pa}	0.25	$F_{pa} \sim F_{lim} \cdot \exp(-1.645 \cdot 0.2)$
F _{target}	0.25	Recovery Plan
F _{MSY}	0.10-0.18	$F_{0.1} - F_{max}$

Source: ICES Advice 2009

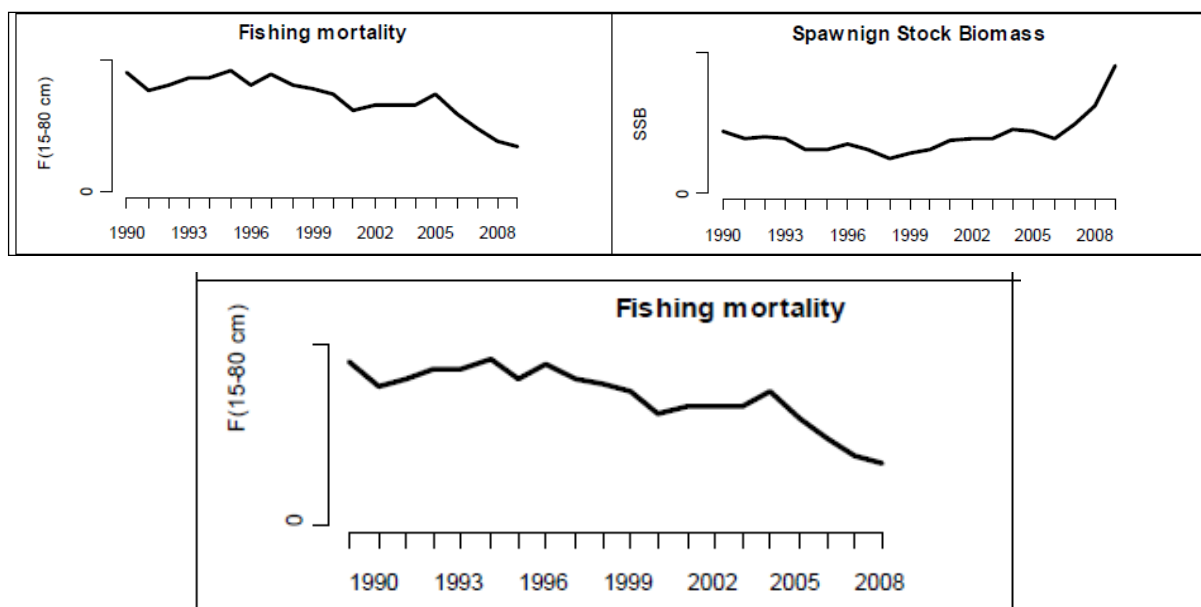
Stock status& reference points using a length-based assessment (2010)

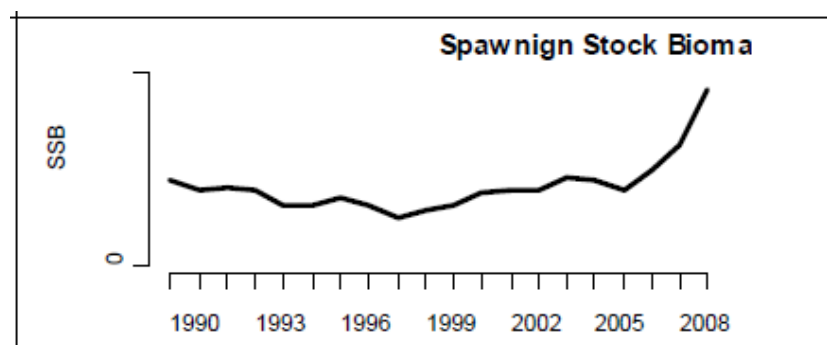
The benchmarked assessment in 2010 led ICES to consider that no reliable assessment can be presented for this stock (due to, mainly, concerns over aging of hake). As a result, the assessment model used by ICES for assessment of the Northern hake stock shifted from an age-based approach to a length-based model in 2010. In this assessment, recruitment estimates appear to be without substantial trends over the whole series, though some increase in recruitment is observed over recent years, with 2008 recruitment estimated to be among the highest of the series. The level of SSB increased from 2006 to 2008 in line with the good incoming recruitments. Fishing mortality was calculated as the average annual for sizes 15-80 cm, and averaged near 1.0 during the 1990s, declining sharply to 0.45 in 2008.

However, as stated above, the length-based assessment could not provide good estimates of current stock abundance and mortality because: (1) the modelled time period, 1990-2009, does not exhibit strong contrast in the available data and (2) little information is available on large fish from the trawl fishery (larger than 60 cm). Therefore, ICES considered that the assessment of the stock status in 2010 (Fig. 3.3) was indicative of trends only.

Following a special request for advice made by the European Commission regarding the definition of reference points consistent with MSY for its introduction in the development of the long term management plan ICES recommended $F_{SSB35\%}$ ($F = 0.29$) as F_{MSY} proxy to be adopted. Stock recruitment relationship cannot be used for the estimation of reference points due to the small variability in spawning stock biomass during 1990-2008 and the subsequent lack of stock recruitment relationship.

Figure 3.2. Summary of stock assessment of hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d





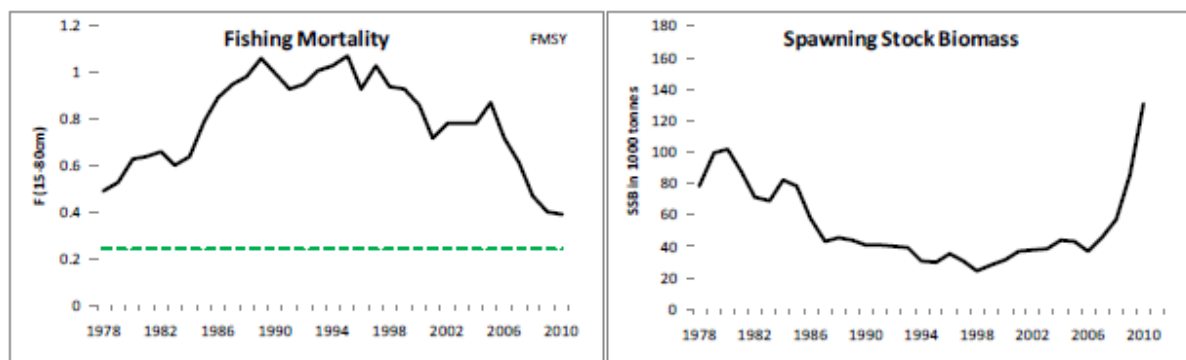
Source: ICES 2010

Stock status& reference points using a length-based approach to assessment (2011)

For the 2011 assessment, the modeled time period was extended back to 1978, providing a clearer perspective of the historical development of the stock and improving the quality of the assessment. The uncertainty of SSB and F estimates is lower, though there was still a shortage of tuning data, particularly in relation to earlier years, for areas outside VII and VIII and the larger individuals in the population.

SSB had been increasing since 1998 and was estimated to be record high in 2011. Fishing mortality has been decreasing in recent years, but was still above F_{MSY} . Recruitment fluctuations appear to be without substantial trend over the whole series. After high recruitment in 2006 to 2008, the last two recruitments were estimated to be low.

Figure 3.3. Summary of assessment results for hake in Division IIIa, Subareas IV, VI, and VII, and Divisions IIIa, b, d carried out in 2011. F is based on lengths 15–80 cm, corresponding to approximately 1–5 years old; in previous assessment years the F age range was 2–6 years old (ICES 2011).

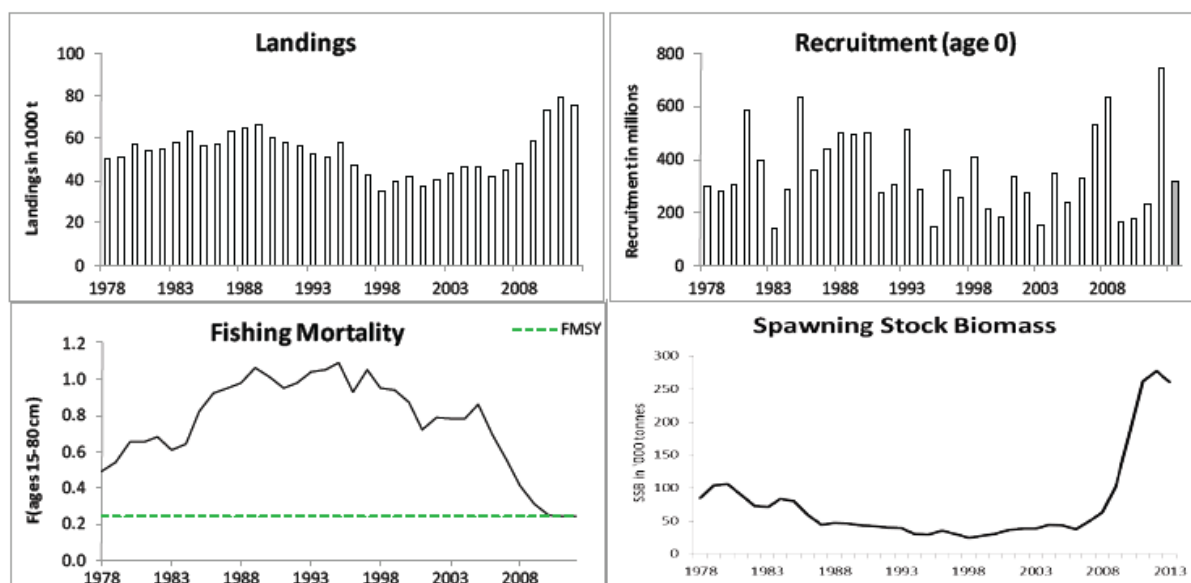


Stock status & reference points using the most recent length-based assessment (2013)

As indicated above, ICES has experienced some uncertainty in the assessment of the northern hake stock, and there was no assessment in 2012.

A length-based model (SS3) was used by ICES WGHMM in the assessment of the northern stock in 2013, which incorporates commercial landings, abundance indices from four survey (EVHOE-WIBTS-Q4, SpPGFS-WIBTS-Q4, IGFS-WIBTS-Q4, and RESSGASC), and uses constant values for the maturity ogive and natural mortality (0.4). (ICES, 2013, see 3.4.2) The latest scientific advice on stock status, given in June 2013, is that SSB has been increasing since 1998 and is estimated to be record high in 2013, whilst fishing mortality has decreased sharply in recent years and was equal to the F_{MSY} proxy in 2011 and 2012 (Fig. 3.5). Recruitment has fluctuated without substantial trend over the whole series. After low recruitments in 2009, 2010, and 2011, the last recruitment (2012) is estimated to be the highest in the time-series.

Figure 3.4. Summary of stock assessment results for hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa,b,d (weights in thousand t) (ICES 2013). Assumed value for recruitment in 2013 is shaded



The current estimates of SSB in 2011 have been revised upwards by 70% and the F in 2010 revised downwards by 36% compared to the 2011 assessment because of upward revisions of incoming recruits. Nevertheless, all signals coming from the surveys and the fishery are consistent in showing a strong increase in stock biomass. The strong 2008 year class can be seen clearly in the landings, and the high recruitment estimated in 2012 is based on consistent observations from two surveys.

This stock will be benchmarked by ICES in 2014, when issues with the assessment will be considered. It is clear, nevertheless, that trajectories for SSB and fishing mortality, and indices of year class strength, have been consistent through the assessments carried out in 2009 – 2013, which suggests that the signals arising from landings and survey information represent a true reflection of the stock's dynamics. Thus, SSB is clearly at an historically high level, well above any precautionary reference point (and, possibly, an MSY-based biomass target), and fishing mortality has fallen to around F_{MSY} .

The assessment still suffers from a shortage of tuning data, particularly in relation to earlier years, for areas outside of Subareas VII and VIII and for the larger individuals in the population. Some discards from Subareas VII and VIII have been included in the assessment since 2003, but there is large uncertainty associated with estimation of discards and discards in northern areas (Subareas IV and VI) which are estimated to have increased in recent years but are not included in the assessment (in 2012 observed, but also partial, discards accounted for 10% by weight of the total catch: ICES Advice 2013, Book 9).

In order to reduce uncertainty in discards estimates, an increased sampling level for on-board observer programmes is needed for some fleets (non-*Nephrops* trawlers, gillnetters, and longliners). Hake otoliths are currently collected but not used in the assessment due to lack of a validated ageing method. It is therefore important that research on hake ageing from otoliths is continued to further investigate the assumed fast growth rate and the high natural mortality that generate a rapid turn-over of the hake stock dynamics.

3.2 Harvest Strategy

In 2004, a recovery plan for the Northern hake stock was implemented (EC Reg. No. 811/2004, Annex 9.4.10). The aim of the plan is to increase SSB to above 140,000 t². This is to be achieved by limiting fishing mortality to 0.25 and by allowing a maximum change in TAC between years of 15% when the SSB is above 100 000 t. This plan uses target values based on precautionary reference points that are no longer appropriate, and has not been evaluated by ICES.

In addition to the 2004 recovery plan, a number of regulations and measures are distinguished in the management of the European northern hake stock. These include:

1. Minimum landing size set at 27cm for fish caught in Subareas IV, VI, VII and VIII and 30cm for fish caught in IIIa.
2. Minimum mesh size of 100mm for otter trawlers when hake comprises more than 20% of the total weight of marine organisms retained on board. This measure does not apply to vessels less than 12m in length and which return to port within 24 hours of their most recent departure (EC Reg. 1162/2001).
3. Minimum mesh size of 100mm for all otter trawlers, in two specific areas, regardless of the amount of hake caught (EC Reg. 494/2002), one in Subarea VII (SW of Ireland) and the other in Subarea VIII (Bay of Biscay).
4. Fishing effort limitations measures (EC Reg. 1954/2003) in a biologically sensitive area in Subareas VIIb, VIIj, VIIg, and VIIh.

The development of the long-term management plan for the Northern hake stock

Article 3 of the hake recovery plan prescribes that a management plan should be implemented when the target biomass (i.e. 140,000 t) has been reached in the past two years. In 2009, a proposal for a Council Regulation establishing a long-term plan for the Northern stock of hake and the fisheries exploiting that stock was presented by the European Commission (COM/2009/0039). The proposed plan aims for the sustainable exploitation of the resource in accordance with the maximum sustainable yield (MSY), on the basis of scientific advice. Also the proposed long-term management plan includes the need for a revision of the fishing mortality reference points, harvest control rules and technical conservation measures.

As a result of the shift in 2010 by ICES from an age-based approach to a length-based model to assess the status of the stock, the assessment was considered indicative of trends only in SSB, fishing mortality and recruitment, which had consequences for the finalisation of the proposed long-term management plan as target and limit biomass reference points were no longer appropriate.

In a special request for advice in June 2010, the Commission asked ICES to advise on whether a target fishing mortality rate of 0.17 (averaged on ages 2 to 6) remains appropriate for exploiting the stock consistently with MSY (as included in 2009 ICES advice). ICES was also invited to comment on any new implications that have arisen concerning the Commission's proposal for a Council Regulation establishing a long-term plan for the northern stock of hake and the fisheries exploiting that stock (COM/2009/039).

The recovery plan was still being used as a basis for management of the hake fishery in 2011.

Reference points

ICES responded to the Commission's request and in 2013 recommended a $F_{30\%SPR}$ (i.e. $F = 0.24$) as a potential proxy for F_{MSY} as direct estimation of F_{MSY} cannot be provided.

Because MSY Btrigger has not been identified for this stock, the ICES MSY approach has been applied without considering SSB in relation to MSY Btrigger (though ICES considers that the current SSB is above any potential candidate value for MSY Btrigger).

Discards of juvenile hake can be substantial in some areas and fleets, and the SSB and both ICES and the Commission have noted for many years that the long-term yield could be substantially improved by reducing mortality of small fish, using measures that shift the selection pattern towards larger fish. TACs have been ineffective in regulating the fishery in recent years as landings greatly exceeded the TACs since 2009 (due, possibly to the disconnect between the Recovery Plan measures and the unexpected large increase in biomass since 2008).

3.3 Harvest Control Rule & Tools

The long-term management plan is still under development, and the harvest control rules used for the setting of TACs have been as described in the Recovery Plan (EC Reg. No. 811/2004, articles 5 & 6).

1. Each year, the Council shall decide by qualified majority on a proposal from the Commission on a TAC for the following year for the northern hake stock concerned.
2. The TAC shall not exceed a level of catches corresponding to a fishing mortality rate of 0.25, based on scientific evaluations carried out by the STECF and the most recent ICES reports
3. The Council shall not adopt a TAC which would lead to a decrease in spawning stock biomass in its year of application, based on STECF and the most recent ICES Advice.
4. Where it is expected that the setting of the TAC for a given year in accordance with paragraph 2 will result in a quantity of mature fish at the end of that year in excess of the target level indicated in Article 2 (i.e. 140,000 t), the Commission will carry out a review of the recovery plan and propose any adjustments necessary on the basis of the latest scientific evaluations. Such a review shall in any event be carried out not later than three years following the adoption of this Regulation with the aim of ensuring that the objectives of the recovery plan are achieved.
5. The following rules shall apply:
 - a. where the rules provided for in paragraph 2 or 4 would lead to a TAC for a given year which exceeds the TAC of the preceding year by more than 15 %, the Council shall adopt a TAC which shall not be more than 15 % greater than the TAC of that year or;
 - b. where the rule provided for in paragraph 2 or 4 would lead to a TAC for a given year which is more than 15 % less than the TAC of the preceding year, the Council shall adopt a TAC which is not more than 15 % less than the TAC of that year.

Setting of TACs in exceptional circumstances.

Where the quantities of mature fish of the Northern hake stock concerned have been estimated by the STECF, in the light of the most recent ICES report, to be less than 100 000t, the following rules shall apply:

- a. Article 5 shall apply where its application is expected to result in an increase in the quantities of mature fish of the Northern hake stock concerned, at the end of the year of application of the TAC to a quantity equal to or greater than 100 000 t;
- b. where the application of Article 5 is not expected to result in an increase in the quantities of mature fish of the Northern hake stock concerned, at the end of the year of application of the TAC, to a quantity equal to or greater than 100 000 t, the Council shall decide by a qualified majority, on a proposal from the Commission, on a TAC for the following year that is lower than the TAC resulting from the application of the method described in Article 5."

ICES advice in 2010, 2011 and 2012 was indicative of trends only and the position of the stock in relation to reference points could not be estimated. Therefore the harvest control rules set under the recovery plan could not be applied to set the TAC for 2011. Instead an EU policy paper on fisheries management that classified the northern hake stock under category 8 was used: “*Stock status is unknown but trends based assessment indicates an increase in SSB. The resulting TAC increase should not exceed 15%*”. The TACs for 2011, 2012 and 2013 were set at the 2010 level; 55.1 kt.

In 2013, on the basis of the MSY approach, which implies fishing mortality at $F_{MSY} = 0.24$, ICES advises that landings in 2014 should be no more than 81,846 t (total catches of no more than 84 111 t if discard rates do not change), which is expected to lead to an SSB of 333,000 t in 2015.

3.4 Information & Stock Assessment

3.4.1 Stock Assessment

Until 2010, stock assessment of northern hake employed apply an Extended Survivors Analysis (XSA, a variant of the Virtual Population Analysis model) to estimate fishing mortality and SSB for the determination of stock status and application of the harvest control rule. XSA uses catch-at-age data to back-calculate the size of each age group and is widely used by ICES for a number of stocks.

However, recent tagging studies of European hake provided evidence of substantial growth underestimation due to age overestimation, and it has been confirmed that the previous internationally agreed aging method (otolith-based age estimation) provided over-estimation of growth.

Subsequently, a length based model (Stock Synthesis SS3) was adopted (by ICES WGHMM) which allows direct use of length-composition data to assess stock status.

3.4.2 Information used in stock assessment

Data for the assessment of the hake stock is obtained from the dependent sources (i.e. commercial catch) and from independent sources (i.e. surveys).

Commercial catch data

Landing weight data are available by year, gear type and ICES division since 1978. However, the new assessment approach requires landings data on a quarterly basis, which have only been available since 1990. Thus, only two decades of landings data are available for model input, which precludes reliable estimates of SSB and fishing mortality rates (due to the lack of contrast in the data).

Length frequency distributions are available by year, gear, country and ICES division. From 1990 length frequency has been collected in a quarterly basis and in a finer geographic resolution (by fishery unit).

Discard data (i.e. data on fish not landed) is collected under the requirements of the EU Data Collection Regulation. Since 2008, discards estimates from several fleets have been used in the length-based assessment.

Surveys

Abundance indices are available and used in the current assessment from a number of research-vessels surveys, including:

- » French Evhoe groundfish survey (EVHOE) started in 1997 and covers the shelf of both the Bay of Biscay and the Celtic Sea in autumn each year.
- » French Ressgac groundfish survey (RESSGASC) that covered the Bay of Biscay and occurred from 1978 to 2002. It was carried out with quarterly periodicity until 1997, and afterwards only twice a year (spring and autumn). Surveys data prior 1987 are not used in the assessment due to a change in the research vessel used at that time.
- » Spanish Porcupine groundfish survey (SP-PGFS) that has been carried out since 2001 in September of every year, covering the Porcupine Bank between longitude 12° W and 15° W and from latitude 51° N to 54° N.

- » Irish Ground Surveys (IGFS) are conducted annually in the autumn to the west of Ireland and in the Celtic Sea.

4. Environmental Elements (P2)

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.

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

4.1 Retained Catch

The four gears under assessment all operate in mixed-species fisheries where hake is generally not the *primary* target species, though it is considered to be the target species in this MSC assessment. Retained species are those that have been caught and landed together with hake. Estimates of the quantities of retained species landed in conjunction with hake in Danish otter trawl, Danish seine, set net and long line fisheries the North Sea and Skagerrak (Tables 4.1, 4.2, 4.3, 4.4 and 4.5 respectively) are based on catch composition data (in kg) provided by the client based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for fisheries/métiers that actually catch hake and which are representative of the UoCs under consideration. These data have been used to identify main (i.e. >5% of total catch) and other retained species for each of the UoCs, split by North Sea and Skagerrak as appropriate to check if there are any substantive differences by fishing area. The data base showed a number of species landings of which individually amounted to less than one tonne (t) for the entire UoC, and these have been omitted from the tables (unless they are ETP species) since they represent a negligible proportion of the total international catch.

4.1.1 Demersal trawl TR2

The Danish demersal trawl fleet lands hake as part of a mixed fishery targeting roundfish, flatfish and *Nephrops* in the North Sea, on the southern edge of the Norwegian Trench and in the Skagerrak in the EU and Norwegian zones. Data on retained species have been presented separately for the North Sea and the Skagerrak which, for some species contain different management “stocks”. Because the species composition of catches taken by demersal trawl fisheries with mesh sizes smaller than 100 mm (TR2) are likely to differ from those for the trawl fisheries using mesh sizes larger or equal than 100 mm (TR1), these have been treated as separate UoCs in this assessment.

Table 4.1. Summary of landings (t) by species taken by the Danish demersal trawl TR2 (mesh <100 mm) UoC when hake was part of the catch, by ICES Division, 2012 (omitting species that contributed <1 t in either the North Sea or Skagerrak). + denotes species in catch that individually comprise <1% of the total by weight. (source: Danish AgriFish Agency)

Species	Skagerrak	North Sea	Total	% of total
wolffish	0.3	0.1	0.4	+
anglerfish	63.4	5.5	69.0	3
whiting	1.6	1.7	3.3	+
dab	12.0	2.2	14.2	1
Nephrops	439.8	282.3	722.1	31
haddock	132.6	4.3	136.9	6
hake	110.1	47.8	157.9	7
ling	13.0	1.1	14.1	1

Species	Skagerrak	North Sea	Total	% of total
pollack	11.3	0.1	11.4	+
saithe	399.6	3.7	403.3	17
spurdog	1.3	+	1.4	+
turbot	1.1	11.9	13.0	1
Common skate	0.1	0	0.1	+
plaice	133.2	164.5	297.7	13
Lemon sole	10.3	8.2	18.5	1
Witch	207.6	4.9	212.5	9
brill	0.4	1.1	1.5	+
edible crab	+	1.6	1.7	+
cod	214.0	16.5	230.6	10
sole	4.0	0.1	4.1	+
TOTAL	1757.7	559.4	2317.1	

The main retained species (>5% of total catch, shown in bold) in the demersal trawl TR2 UoC using mesh size smaller than 100mm in the North Sea are Nephrops, plaice and cod (as a vulnerable species), and in the Skagerrak are Nephrops, haddock, saithe, plaice, witch and cod, whilst anglerfish, dab, ling, pollack, turbot and lemon sole are minor retained species that comprise more than a negligible proportion (>1%) of the catch.

4.1.2 Demersal trawl TR1

Table 4.2. Summary of landings (t) by species taken by the Danish TR1 (mesh >100 mm) UoC fishing in the Skagerrak (Div. IIIa) and North Sea (Divs IVa,b) when hake was part of the catch in 2012 (omitting species that contributed <1 t in either the North Sea or Skagerrak) . + denotes species in catch that individually comprise <1% of the total by weight.

Species	Skagerrak	North Sea	Total	
tusk	0	23.1	23.1	+
megrim	0	26.2	26.2	+
wolffish	2.7	117.9	120.6	1%
anglerfish	6.6	610.6	617.2	5%
halibut	0.1	9.6	9.7	+
whiting	0.1	69.2	69.3	1%
dab	16.8	45.1	61.8	1%
Nephrops	7.2	198.5	205.7	2%
haddock	190.3	566.1	756.4	7%
hake	39.6	1524.4	1564.0	13%
ling	1.1	385.4	386.5	3%

Redfish S. viviparous	0	5.9	5.9	+
pollack	5.1	64.7	69.8	1%
saithe	63.2	2980.1	3043.3	26%
spurdog	0	3.5	3.5	+
turbot	3.7	58.4	62.1	1%
common skate	0	4.7	4.7	+
red gurnard	0	1.8	1.8	+
plaice	160.7	1986.4	2147.1	18%
lemon sole	18.9	286.5	305.4	3%
witch	5.4	130.8	136.2	1%
brill	0.1	13.5	13.6	+
golden redfish	0	2.7	2.7	+
edible crab		1.5	1.5	+
cod	146.9	1829.3	1976.2	17%
Total	669.1	10946.9	11616.0	

(Source: Danish AgriFish Agency)

The main retained species (>5% of total catch, shown in bold) in the TR1 UoC using mesh size larger than 100mm and catching hake in the North Sea are anglerfish, haddock, saithe, plaice and cod, and in the Skagerrak are haddock, saithe, plaice and cod, whilst wolffish, whiting, nephrops, dab, ling, pollack, turbot, lemon sole and witch are minor retained species that comprise more than a negligible proportion (>1%) of the catch.

Golden redfish (*S. marinus*) is considered to be an ETP species in Sub-areas I and II, and it will be considered as main retained (vulnerable) species here.

In the scoring tables the team has scored the outcome status for the main retained species individually and then an overall score was assigned by applying the scoring rule described in p18 from FAM v2 (Table C2).

4.1.3. Danish seine

The client vessels deploying Danish seine and landing hake are recorded to operate predominately in the Skagerrak (Table 4.3).

Table 4.3. Summary of landings (t) by species taken by the Danish seine UoC when hake was part of the catch, by ICES Division, 2012 (omitting species that contributed <1 t in either the North Sea or Skagerrak). + denotes species in catch that individually comprise <1% of the total by weight.

	Skagerrak	North Sea	Total	% of total
wolffish	0.8	2.2	3.0	+
anglerfish	1.4	2.7	4.1	+
dab	11.9	6.7	18.6	1
haddock	490.7	13.4	504.1	32
hake	28.8	9.9	38.7	2
pollack	4.7	+	4.7	+
saithe	13.5	1.1	14.6	1
plaice	493.7	187.6	641.3	40
lemon sole	10.2	2.6	12.8	1
witch	77.3	0.7	78.0	5
cod	166.7	111.1	277.7	17
TOTAL	1260.2	339.6	1599.8	100

(Source: Danish AgriFish Agency)

The main retained species (>5% of total catch) in the Danish seine UoC in the North Sea are plaice and cod, and in the Skagerrak haddock, plaice, witch and cod, whilst dab, saithe and lemon sole are minor retained species that comprise more than a negligible proportion (>1%) of the catch.

4.1.4. Set net

Table 4.4. Summary of landings (t) by species taken by the Danish set net UoC when hake was part of the catch, by ICES Division, 2012 (omitting species that contributed <1 t in either the North Sea or Skagerrak). + denotes species in catch that individually comprise <1% of the total by weight.

Species	Skagerrak	North Sea	total	% of total
wolffish	0.2	1.3	1.5	+
anglerfish	0.1	12.1	12.2	2
dab	0	1.3	1.3	+

Edible crab	0	1.0	1.0	+
haddock	1.7	4.6	6.3	1
hake	1.1	286.5	287.6	51
ling	0	2.9	2.9	1
pollack	4.5	6.7	11.2	2
saithe	1.7	4.9	6.6	1
turbot	0	13.9	13.9	2
plaice	0.8	11.5	12.3	2
lemon sole	+	1.2	1.2	+
porbeagle		1.4	1.4	+
cod	7.8	191.9	199.7	36
Total	18.1	542.6	560.7	100

(Source: Danish AgriFish Agency)

The Danish set-net fisheries primarily targets cod and plaice in the North Sea and the Skagerrak, and sole in the southern North Sea. However, when only landings that include hake are considered, it is apparent that only cod is a main retained species in the North Sea, whilst haddock, pollack, saithe, plaice and cod are main retained species in the Skagerrak. Anglerfish, ling, turbot and plaice might be considered to be minor retained species (Table 4.4).

4.1.5 Long line

The Danish long line fishery had not been practiced for some years, but some vessels have recently been equipped for this fishery and have resumed longlining. These vessels are < 15 m and do not complete EU log books. However, data on landings of three long-line vessels have been provided to the team by the client; for one vessel covered the whole year 2010; and for two other vessels for part of 2010. **Table 4.5** shows the catch composition obtained by combining landings data for the three vessels. Cod and haddock are the main retained species in this fishery, whilst ling and pollack are minor retained species. Note that no hake are reported to be landed from the Longline UoC. **Please note:** The Longline Unit of Certification has since been removed from the assessment following the granting of a variation by the MSC.

Table 4.5. Landings (t) of retained species in the Danish long line fishery in 2010.

Species	Total landings	% of catch
cod	81.3	79
haddock	17.1	17
ling	3.4	3
pollack	1.2	1
Total	103.0	

Data Source: DTU Aqua, 2010

Retained species stock status (ICES 2013 Advice)

Haddock: haddock in Sub-area IV (North Sea) and Division IIIa West (Skagerrak) is assessed using an age-based XSA by ICES, which provides advice set against MSY and precautionary approach-based biological reference points (ICES, 2013). Though recent recruitment has been moderate, and the stock has been declining steadily since 2003, it is currently within all safe reference levels and retains full reproductive capacity. An EU–Norway management plan has been implemented and ICES has endorsed it as being consistent with the MSY and precautionary approaches.

Cod: Latest advice for Cod in Sub-area IV (North Sea) and Divisions VIIId (Eastern Channel) and IIIa West (Skagerrak) estimates that SSB has continued to recover since the mid-2000s, although it remains at a low level. The stock is considered to be just at Blim, but remains below MSY and management plan trigger points. Fishing mortality continues to be above target F_{MSY} but below the target F(MP).

Saithe: ICES' 2013 advice for saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) shows that SSB increased above Bpa in 1997, but has declined steadily since 2005. The latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around F_{MSY} since 1997. Recruitment has been below average since 2006 and shows a declining trend in recent years. Despite there being an increased risk, the saithe remains above Blim. This still makes SG80 for saithe as the stock is remains above Blim, despite there being an increased risk.

Plaice: plaice in the Skagerrak is considered to have two components: Eastern and Western, the latter being mixed with the North Sea stock. Advice for Division IIIa plaice is now split into plaice in subdivision 20 and plaice in Kattegat, Belts, and Sound (subdivisions 21–23). No analytical assessment is available for the Skagerrak alone. In 2013, ICES reports that a combined assessment of plaice in the Skagerrak and the North Sea shows a consistent increase in the total SSB, which is well above MSY Btrigger for the North Sea stock. In recent years, fishing mortality has been estimated below F_{MSY}. There is a high degree of certainty that NS plaice are within biologically based limits (SG100). Score 100. The West Skagerrak survey biomass index suggests that, in recent years, the Western component is higher than the historical average. Overall F is uncertain, though effort has been reduced sharply in recent years. This is sufficient evidence to consider that the Skagerrak retained catch of plaice from subdivision 20 meets with SG80.

Anglerfish: The anglerfish stock in Division IIIa and Subareas IV and VI is subject to a trends-based assessment using abundance indices from directed anglerfish surveys. Trends in both abundance and biomass appeared to peak about 2007 – 2008 and have since been declining. Because of uncertainties concerning catch-at-age data for anglerfish as well as limited knowledge about population dynamics, a more robust estimate is not possible. Accordingly, it is not possible to say that the anglerfish stock is highly likely to be within biologically based limits (SG80). However based on current biomass estimates for anglerfish in subarea IV which have been relatively stable over the past 5 years and apparent stability in catches in recent years, it seems likely that the stock is within biologically based limits (SG60).

Ling: There is no quantitative stock assessment for ling. In the North Sea its stock status is inferred from trends in catch per unit of effort in the Norwegian long-line fisheries. There has been a sustained positive trend since 2000, but the status of the stock is unknown in the absence of biological reference points.

Pollack: There is no analytical assessment nor any biological reference points for pollack, and the state of the stock is unknown. However, total international landings from the North Sea have been relatively stable at c. 1500 – 2000 t over the past 20 years.

Turbot: There are no analytical assessments for turbot, and ICES consider that the available information is inadequate to evaluate stock trends (WGNEW 2010). Nevertheless, the three relevant survey series indicate increasing abundance of most age-groups of turbot between 2002 and 2010. The relatively low importance attached to turbot in North Sea fisheries is reflected in the lack of precautionary reference points, specific management plan or an EC minimum landing size, though precautionary TACs have been defined for turbot and brill (combined) in EC-fisheries in Division IIa and Sub-area IV. ICES published a trends-based assessment for turbot in Subarea IV (North Sea) in May 2013 (ICES 2013). Fishing mortality was estimated at 0.46 in 2012, lower than the long term geometric mean (0.54). The SSB in 2012 was estimated to be 4 277t, increasing to 5 090t in 2013. Landings of turbot have been stable since 1995 and recruitment has been variable around the long-term average. An observed sudden increase in F appears to be related to a reduction of the minimum landing size in 2001. Since then fishing mortality has declined. Current indications are that spawning-

stock biomass is at a low level, but has been gradually increasing in recent years.

Redfish (*Sebastes* spp.): The main species of redfish taken in the client fleet (TR1 UoC fishing in the North Sea) is the redfish *Sebastes viviparus* (5.9t in 2012), with a smaller catch of golden redfish *S. marinus* (2.6 t in 2012). ICES' assessment of golden redfish in Subareas I and II, shows that SSB has been decreasing since the 1990s and is currently at the lowest level in the time-series, whilst fishing mortality is considered to be well above a sustainable level for a redfish stock. As a consequence, ICES' advice for golden redfish in Subareas I and II in 2013–2016 is that there should continue to be no fishing on this stock (advice for 2008 – 2012 no directed fishery and low by catch limits), and that any by catch of *S. marinus* should be kept as low as possible. The current annual catch of the client fleet is c. 2.6 t, which is 0.04% of the international total landings of 6,000 t as estimated by ICES, and is therefore not important in management terms.

Dab: According to IBTS Q1 data for the North Sea, the abundance of dab has increased substantially in the long-term (at least to 2005), in part related to opportunistic adaptations to trawl fisheries and the restrictions on effort associated with the plaice and sole management plan.

Lemon sole: Survey cpue indices suggest that the abundance of lemon sole in the North Sea increased fourfold between 1991 and 2005, though this rise in abundance was not reflected in landings. ICES advice for lemon sole in 2013 notes that there are no known management objectives for lemon sole, and insufficient data to assess stock status.

Nephrops: It is assumed that catches in 2012 from the North Sea came from functional units 33 ('Off Horns Reef') and 32 ('Norwegian Deep'). Catches of Nephrops in both areas have declined in recent years, and the status of individual "stocks" is unknown. However, there has been a long-term increase in lpue in FU 33 and the stock is likely to be within biologically-based limits: at FU32 is likely to be within biologically-based limits. Current management of Nephrops in Sub-area IV (both in terms of TACs and effort) does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in functional units. In the current situation, vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way and this has historically resulted in inappropriate harvest rates from some areas.

Within the Skagerrak, ICES' advice in 2013 for Nephrops (functional units 4 and 5) is that estimates of absolute abundance for 2011 and 2012 from an underwater TV (UWTV) survey for the whole (Skagerrak) showed a 30% decrease, though the landings per unit effort suggest an increase in biomass over the full time-series. Though no estimates of stock status are available, ICES considered that the stock is exploited sustainably, and it is likely that the Nephrops in FU 4 and 5 are within biologically based limits (and $F < F_{MSY}$). However, no reference points are defined for either stock, and no specific management objectives are known to ICES.

Wolffish are not identified to species in the landings, but it is possible that the species caught in the Danish UoCs is Atlantic wolffish *A. lupus*. All wolffish species are slow growing and long-lived fish that spawn late in life (5-8 yrs), the male guards large clusters of eggs deposited on the bottom until they hatch, which makes them vulnerable to bottom trawling. Because wolffish has limited commercial importance - it makes up only a small proportion of trawl catches - there has been no assessment of its stock dynamics, and ICES do not provide advice for this species. Anecdotal information from stakeholders suggests that it is most likely not overfished.

Whiting: There is no robust ICES assessment of the whiting stock in Subarea IV (North Sea) and Division VIIId (Eastern Channel), for which reference levels are undefined and only indicative trends in SSB and F are available. These show that SSB in 2009 was around half the level observed in 1990 and remains below average, but above Blim (lowest observed SSB, in 2007). Fishing mortality reduced considerably since 1990 and has been stable over the last 4 years. Abundance estimated from the IBTS Q1 and Q3 surveys indicate that whiting appears to be declining in the northern North Sea, and recruitment has been well below average since 2003.

Witch: ICES Advice (2013) for witch in Subarea IV and Divisions IIIa and VIId is that both landings and survey abundance indices show a declining trend since the peak observed in 2000 and an increase in recent years (survey abundance indices were >20% higher in 2011–2013, than the average for 2006–2010). However, exploratory estimates suggest that fishing mortality is above any potential FMSY proxies. No specific management objectives are known to ICES. An EU TAC is set for EU waters of area IIa and IV together with lemon sole.

Management of retained species

Management of the exploitation of retained species in the North Sea and Skagerrak takes the form of a comprehensive array of species- and gear-specific catch and effort controls and technical measures, including the following:

- » TACs and Quotas
- » Minimum landing sizes (MLS)
- » Closed areas
- » Technical gear restrictions
- » Cod recovery plan and days at sea
- » Plaice and sole management plan
- » Ban on high grading
- » Ban on discards in Norwegian zone

TACs and Quotas

A Total Allowable Catch (TAC) for specific species/stocks is set annually by the EU Council within the Exclusive Economic Zones (EEZs) of the EU Member States. TACs are then divided between the Member States into national quotas, based on fixed proportions (“relative stability”). Table 4.6 shows the retained species for which a Danish quota has been set and whether there is a specific MLS or mesh size control. Landings statistics are recorded from daily logbook and sales notes data. This allows trends and a total volume of species landed to be monitored and provides evidence that the overall objective of TACs and quotas are being achieved.

Table 4.6 Record of where Quotas, Minimum Landing Sizes and Minimum Marketing Sizes are in place for retained species.

Species	Quota	MinLS	MinMS	Species	Quota	MinLS	MinMS
Atlantic cod	Y	Y	Y	Megrim	Y	Y	Y
Brill	Y			Anglerfish	Y		Y
Wolffish				<i>Nephrops</i>	Y	Y	Y
Common dab	Y		Y	Pollack	Y	Y	Y
North Sea plaice	Y	Y	Y	Saithe	Y	Y	Y
Skagerrak plaice	Y	Y	Y	Turbot	Y		
Haddock	Y	Y	Y	Tusk	Y		
Lemon sole	Y		Y	Whiting	Y	Y	Y
Ling	Y	Y	Y	Witch flounder	Y		

Minimum landing sizes and minimum marketing standards

Annex XII of EU Regulation No 850/98 sets out the minimum landing sizes below which animals are not to be retained on board, transshipped, landed, transported, stored, sold, displayed or offered for sale and must be returned immediately to the sea. In addition, Council Regulation (EC) No 2406/96 sets out common marketing standards for certain fishery products, under which a minimum marketing size is established which indirectly acts as a minimum landing size for certain species.

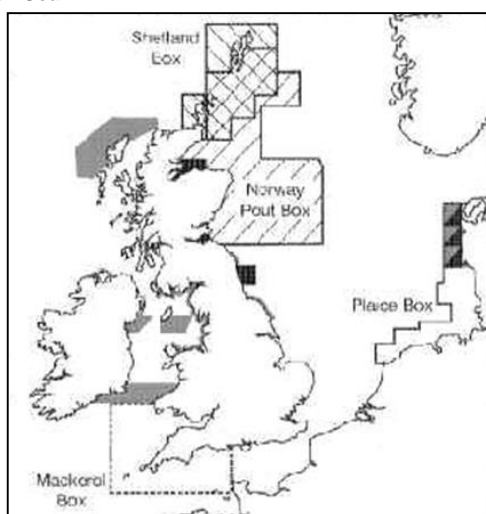
Sales notes record size categories of fish and shellfish landed and act as evidence that this management measure is achieving its overall objective.

Closed areas

Closed boxes

There are a number of fixed closed areas or boxes within the North Sea (Figure 4.1). These have various restrictions relating to the number and nationality of vessels that can fish in the area (e.g. Shetland box), power of vessels allowed to operate in the area (e.g. plaice box), gear restrictions such as mesh size (e.g. Norway pout box) and seasonal restrictions (Patch bank, Norway). While these restrictions are applicable to Danish vessels, they tend not to apply to the grounds where Danish fisheries take hake. Nevertheless these measures limit effort and therefore directly or indirectly influence management of the retained species stocks.

Figure 4.1. Closed areas in the North Sea



Real Time Closures

A Real Time Closure (RTC) system is in place for the North Sea and Skagerrak as part of an agreement between the EC and Norway. This is designed to protect juvenile cod, haddock, whiting and saithe by closing an area for 21 days when a 200kg catch sample contains more than 15% by weight of juveniles (<MLS) of these species. This closure also indirectly protects all species within the closed areas.

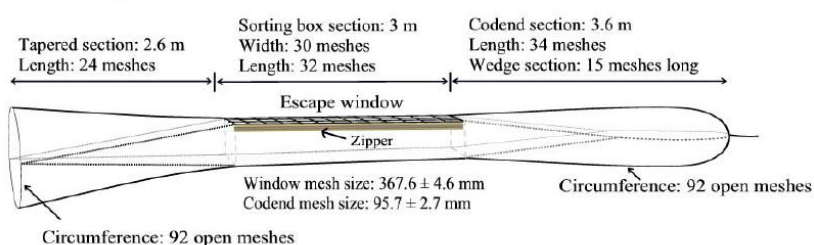
Technical gear restrictions

Demersal otter trawl fisheries within the EU zone operate with different mesh sizes dependent on target species and area and providing that a certain percentage of the catch consists of the target species. For example, when the target species is Nephrops, a minimum mesh size of 80 mm is allowed in the North Sea and 90 mm in the Skagerrak, though it is known that the bycatch of juvenile cod may be high, especially in the Skagerrak Nephrops fishery (ICES, 2011). Since the EU-Norway deal concluded in 2012, the only gears allowed in the demersal fisheries in the Skagerrak from 1 February 2013 are those

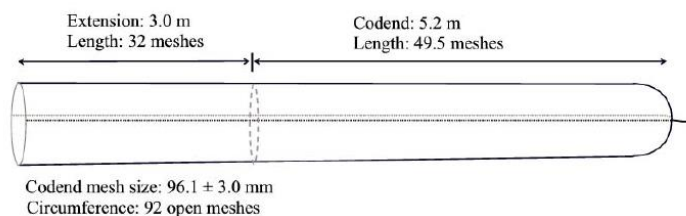
that use a minimum 120 mm cod-end (=TR 1) for roundfish/flatfish fisheries; and the SELTRA trawl for the mixed Nephrops/roundfish fisheries, which has been designed to be as size selective for juvenile roundfish (cod, haddock, saithe, hake etc.) as a TR 1 trawl, but is able to retain Nephrops. The majority of hake taken from the North Sea is caught within the Norwegian zone and therefore 120mm mesh sizes are used. The client has indicated that vessels moving from Norwegian to EU zone operate the same gear and use 120mm across both areas.

As of 2013, TR2 trawls must be fitted with a selectivity device; the Seltra trawl and the Swedish grid are two common devices used, with the Seltra being the most commonly used device by the Danish fleet. The basic rule is that the mesh size should be at least 120 mm diagonal mesh (diamond mesh). Fishing may be conducted with 90 mm diamond mesh with a 140 mm panel with square mesh or a 270 mm panel with diamond mesh. In both cases, this panel must be at least 3 m long and placed at 4 m from the (cod) end of the trawl. The selection panel shall be the same width as the header (upper part) of the trawl (should be attached between the seams). If diamond mesh is used in the panel in a four panel bag this shall be mount with three 90-mm mesh to a 270 mm mesh. Note that, because this gear has been recently been introduced in the Skagerrak fisheries, at the beginning of 2013, there are as yet no published reports on bycatch composition.

Sorting box



Standard codend



Additional management measures for cod came into force during 2009 (EU-Norway Agreement, 2008) including:

- » To ensure that cod quota is taken up steadily throughout the year quota uptake is monitored to quarterly targets. Technical changes are required where volumes of cod reach more than 10% above the target.
- » Technical / selectivity measures, such as eliminator trawls (including BACOMA and T90), are also required if 90% of the cod quota has been taken at any time before 15th November ensuring sufficient escapement so that the remaining 10% is not likely to be exceeded.

Cod recovery plan and Days at Sea

At the December 2002 Fisheries Council Member States agreed to reduce their fishing effort on cod by 65% and to implement a Cod Recovery Plan with limits on days at sea (for vessels over 10m) to achieve this (reference). There are many papers that review the success or failure of the Cod Recovery Plan.

In December 2008 the European Commission and Norway agreed on a new cod management plan implementing a new system of linked effort management with a new target fishing mortality. ICES evaluated this management plan in March 2009 and concluded that it is consistent with the precautionary approach if advice therefore allows catches of cod to be taken under this new management agreement.

Other measures

Other measures that are known to have a positive impact on retained species include a ban on high grading for Danish vessels and a ban on discarding in the Norwegian zone. These are discussed below.

4.2 Discarding / Bycatch

All units of certification have in place measures that are specifically designed to reduce or eliminate discarding. The European ban on high grading that came into force on 1st January 2010 acts to minimize discarding across all North Sea and Skagerrak fisheries, although the level of enforcement is not known. The Norwegian ban on discarding is strictly enforced and applies to Danish vessels fishing within the Norwegian EEZ, where there are closed areas including Real Time Closures specifically designed to protect juvenile nursing grounds. Since 1st January 2013, the Norwegian discard ban is also in force for EU vessels fishing in the Skagerrak, and it is expected that the discard ban in EU waters of Skagerrak will be implemented simultaneously with that in the North Sea.

4.2.1 Demersal trawl

The quantities of species discarded by the Danish demersal trawl fleet operating in the North Sea and Skagerrak in 2008 were estimated using observer trip discard percentages, averaged over a running 4-year period and then multiplied with the total landings of all species for the demersal trawl fleet for the full year (2008, in this case) (DTU Aqua, 2011). These data indicate that the highest proportion of discards is of cod (24% of all discards by weight) followed by *Nephrops* (22%), and starry ray (19%) haddock, saithe, plaice, long rough dab, common dab and hake. In the towed gear fisheries, many of the technical measures have stipulated changes to codend mesh size or the inclusion of square-mesh escape panels in order to reduce discards (Enever et al, 2009).

More recent data on landings and discards are available from STECF, related to effort management under the long-term cod management plan, covering the period 2010-2012 (Source: STECF 2013 App 2-2 Landings Discard rates: stecf.jrc.ec.europa.eu/data-reports). However, several UoCs are combined in some datasets (e.g. TR1 = all towed gears > 100 mm, including Danish Seine; and TR2 all towed gear <100 mm) and the data include all Danish effort with that particular gear – including métiers that do not catch hake (especially applies to set nets). The following tables are summaries of these data sets, for the North Sea and Skagerrak separately, omitting any species (other than ETP species) the average annual catches of which amounted to less than one tonne over the years 2010 - 2012.

Demersal trawl TR2 (cod end < 100 mm)

Table 4.7. Summary of landings (t) by species taken by the Danish TR2 UoC when fishing in the North Sea (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species).

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Cod	37.2	11.4	3.8%	33.8	5.9	1.7%	28.8	3.9	1.6%
Dab	19.1	242.8	20.5%	8.4	609.5	26.8%	4.3	685.1	33.2%
Lemon sole	17.9	2.4	1.6%	13.4	7.76	0.9%	12.9	2.7	0.8%
Nephrops	289.9	36.9	25.5%	486.806	181.5	29.0%	469.8	327.6	38.4%
Long rough dab	1.4	21.6	1.8%	0.4	17.5	0.8%	0.1	20.3	1.0%
Plaice	356.2	61.6	32.7%	311.4	425.8	32.0%	217.6	114.3	16.0%
Rays	3.7	13.8	1.4%	0.2	21.0	0.9%	0		+
Whiting	4.6	3.4	0.6%	8.5	5.9	0.6%	8.4	2.2	0.5%

(Source: STECF 2013).

Table 4.8 Summary of landings (t) by species taken by the Danish TR2 UoC when fishing in the Skagerrak (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species).

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Chimaera monstrosa	0.1	1.1	+	0.1	458.2	3.6%	+	4.2	+
Cod	983.7	962.0	18.1%	973.2	1369.9	18.6%	1021.0	1120.8	20.3%
Dab	39.0	46.1	0.8%	60.1	33.4	0.7%	131.3	95.9	2.2%
Spurdog	3.8	5.0	0.1%	16.4	0.3	0.1%	11.4	6.0	0.2%
Haddock	290.3	311.3	5.6%	497.5	867.7	10.8%	815.5	507.9	12.5%
Hake	188.7	67.0	2.4%	262.9	15.7	2.2%	199.3	76.8	2.6%
Lemon sole	50.95	12.3	0.6%	74.6	7.8	0.7%	153.4	14.2	1.6%
Nephrops	1859.6	1294.9	29.3%	1769.2	1023.6	22.1%	1494.5	911.5	22.8%
Long rough dab	0.3	224.0	2.1%	0.2	487.7	3.9%	+	178.9	1.7%
Plaice	561.9	37.6	5.6%	880.9	84.7	7.7%	839.7	120.5	9.1%
saithe	2537.74	79.1	24.3%	1645.5	290.0	15.3%	1238.8	40.25	12.1%
Rays	6.2	49.9	0.5%	9.9	165.0	1.4%	11.9	82.9	0.9%
Roundnose grenadier	0.1	0.4	+	0.2	387.3	3.1%	0.2	0.3	+
Whiting	25.26	215.1	2.2%	27.6	206.6	1.9%	21.96	99.6	1.2%
Witch	375.1	87.9	4.3%	418.7	180.1	4.7%	749.9	165.7	8.7%

(Source: STECF 2013)

The main discarded by catch species (>5% of total catch) in the TR2 UoC in the North Sea are dab, Nephrops and plaice, whilst anglerfish, cod, lemon sole and long rough dab and witch are minor retained species that comprise more than a negligible proportion (>1%) of the catch. Rays may be vulnerable species that are discarded in significant quantities.

The main discarded by catch species in the TR2 UoC in the Skagerrak are cod, haddock, Nephrops, plaice, saithe and witch, whilst dab, lemon sole, long rough dab and whiting are minor retained species that comprise more than a negligible proportion (>1%) of the catch. Chimaera monstrosa, spurdog, rays and roundnose grenadier may be vulnerable species that are discarded in significant quantities.

Demersal trawl TR1 (cod end > 100 mm).

Table 4.9. Summary of landings (t) by species taken by the Danish TR1 UoC when fishing in the North Sea (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species).

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Anglerfish	1309.5	6.2	5.7%	1144.4	0.6	4.8%	1200.7	8.5	5.0%
Cod	3478.1	332.2	16.4%	3109.8	82.6	13.4%	3378.8	303.7	15.1%
Dab	365.2	234.16	2.6%	476.2	161.2	2.7%	258.2	246.0	2.1%
Spurdog	5.9	2.6	+	6.1	0.6	+	18.0	0	0.1%
Haddock	660.1	87.5	3.2%	667.0	69.9	3.1%	987.8	222.4	5.0%
Hake	1419.5	532.4	8.4%	1387.1	468.0	7.8%	1636.6	260.4	7.8%
Ling	436.2	0.22	1.9%	546.9	3.2	2.3%	423.7	0	1.7%
Nephrops	306.9	96.3	1.7%	336.6	0.8	1.4%	249.1	79.0	1.3%
Plaice	6051.2	7.4	26.1%	7948.6	72.5	33.7%	8339.6	291.9	35.4%
Pollack	4785.0	33.7	20.8%	5130.2	2.5	21.6%	4192.4	54.0	17.4%
Rays	20.6	804.2	3.6%	33.56	166.9	0.8%	18.2	297.5	1.3%
Whiting	119.5	130.4	1.1%	107.1	1.3	0.5%	93.6	22.4	0.5%
Witch	237.6	18.6	1.1%	235.3	0.3	1.0%	237.8	15.7	1.0%

(Source: STECF 2013)

Table 4.10. Summary of landings (t) by species taken by the Danish TR1 UoC when fishing in the Skagerrak (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species)

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Cod	1083.0	511.5	14.3%	937.0	379.9	12.5%	1119.1	312.1	13.9%
Dab	300.5	135.8	3.9%	359.5	475.1	7.9%	386.1	325.1	6.9%
Spurdog	0.5	3.9	+	0.1	0.1	+	0.2	1.0	+
Haddock	852.4	198.2	9.4%	1188.2	236.0	13.5%	1127.6	99.7	11.9%
Lemon sole	186.7	28.0	1.9%	121.1	11.0	1.3%	249.9	20.8	2.6%
Nephrops	103.6	197.3	2.7%	17.8	70.3	0.8%	10.5	65.3	0.7%
Plaice	5363.5	534.3	52.9%	5289.2	665.2	56.4%	5079.8	808.7	57.1%
Saithe	870.2	16.9	8.0%	127.7	30.69	1.5%	143.3	5.16	1.4%
Rays	0.3	104.4	0.9%	0.2	202.3	1.9%	0.2	20.8	0.2%
Witch	156.7	16.2	1.6%	126.1	16.8	1.4%	173.9	24.5	1.9%

(Source: STECF 2013)

The main discarded by catch species (>5% of total catch) in the TR1 (<100 mm mesh) UoC in the North Sea are anglerfish, cod, plaice and pollack, whilst dab, haddock, ling, Nephrops, rays and witch are minor by catch species that comprise more than a negligible proportion (>1%) of the catch.

The main discarded by catch species in the TR1 UoC in the Skagerrak are cod, dab, haddock and plaice, whilst lemon sole, Nephrops, saithe and witch are minor by catch species that comprise more than a negligible proportion (>1%) of the catch. Spurdog and rays may be vulnerable species that are discarded in significant quantities in both areas.

4.2.2 Danish seine

Table 4.12 presents data on discarding for Danish seine fleet in the Skagerrak in 2008, derived in the same manner as for demersal trawl. Note that there are no separate data from STECF for Danish seine fisheries.

The main discard species for Danish seine fishery in Skagerrak are plaice, cod, dab and starry ray, whilst haddock, long rough dab and grey gurnard are also discarded in other than negligible quantities. In the North Sea, the main discard species for Danish seine fishery are plaice, dab, grey gurnard and starry ray, whilst haddock are also discarded in other than negligible quantities. The Danish seine fishery is subject to the same technical control measures as the demersal trawl fishery.

Table 4.11 Estimated discards (t) from all Danish seine fisheries in the North Sea and Skagerrak in 2009 (DTU Aqua, 2011). Data have been extrapolated by DTU Aqua based on actual observer trip discard percentages. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species).

	North Sea	Skagerrak	Total	% total discards
Cod	9.8	410.7	420.5	24.1%
Starry ray	24.6	87.0	111.6	6.4%
Haddock	2.5	83.1	85.6	4.9%
Plaice	103.3	678.3	781.6	44.8%
Long rough dab	0.0	39.8	39.8	2.3%
Dab	42.0	169.6	211.6	12.1%
Hake	1.3	22.1	23.4	1.3%
Grey gurnard	30.6	5.6	36.2	2.1%

Data source: DTU Aqua, 2011

4.2.3 Set nets

Data on landings and discards by species that were collected on observer trips on Danish gill net vessels in the North Sea over the period 1995-2010 were available to the team, though only two such observer trips were made after 2005. From the complete data set it appears that the catches of a number of species are relatively low, and that the highest levels of discarding are of common dab and starry ray.

Data on landings and discards available from STECF, covering the period 2010-2012, include all Danish effort with set nets. The following table presents a summary of these data, for the North Sea and Skagerrak separately, omitting any species (other than ETP species) the average annual catches of which amounted to less than one t over the years 2010 - 2012.

Table 4.12. Summary of landings (t) by species taken by Danish Gill nets (part of set net UoC) when fishing in the North Sea (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species)

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Cod	1930.6	+	39.3%	1704.7	96.511	38.6%	1381.422	50.505	38.5%
Dab	97.3		2.0%	74.3	15.9	1.9%	53.3	14.5	1.8%
Spurdog	1.7	0	+	2.2	+	+	1.2	0	+
Hake	406.2		8.2%	378.4	0	8.1%	423.3	0.1	11.4%
Plaice	1564.2	0	31.7%	1419.1	2.0	30.5%	905.3	2.9	24.4%
Rays	5.4		0.1%	3.8	+	0.1%	1.8	6.8	0.2%
Turbot	240.4	0	4.9%	298.7	2.6	6.5%	236.5	10.7	6.6%

(Source: STECF 2013)

Table 4.13. Summary of landings (t) by species taken by Danish Trammel nets (part of set net UoC) when fishing in the North Sea (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species).

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Cod	101.3	0	2.4	67.7	6.7	6.0	123.0	6.1	5.7
Dab	22.1	1952.0	46.6	31.6	4.6	2.9	64.4	12.7	3.4
Plaice	617.7	1476.0	49.4	1008.1	1.8	81.5	1883.2	6.3	83.9

(Source: STECF 2013)

Table 4.14. Summary of landings (t) by species taken by Danish Gill nets (part of set net UoC) when fishing in the Skagerrak (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species).

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Cod	748.8	15.2	57.1%	660.4	13.1	47.3%	518.6	9.5	1.3%
Dab	7.0	0.8	0.6%	15.2	3.0	1.3%	16.2	2.9	1.9%
Plaice	226.7	3.1	17.2%	486.7	3.7	34.4%	259.6	14.5	26.6%
saithe	63.3	0.7	4.8%	38.9	2.0	2.9%	11.6	0.8	1.2%
Pollack	149.9	0.4	11.2%	80.6	2.2	5.8%	81.3	0	7.9%

(Source: STECF 2013)

Table 4.15. Summary of landings (t) by species taken by Danish Trammel nets (part of set net UoC) when fishing in the Skagerrak (not selected for days when hake was part of the catch), 2010 - 2012. Species that individually comprise <1% of the total by weight or have negligible discards are omitted (unless ETP species).

Species	Landings 2010	Discards	% Total	Landings 2011	Discards	% Total	Landings 2012	Discards	% Total
Cod	53.9	1.6	22.2%	48.0	1.5	16.3%	52.2	1.2	22.2%
Dab	2.6	0.3	1.1%	3.1	0.4	1.2%	6.9	0.9	3.2%
Plaice	162.4	1.5	65.6%	233.1	0.3	76.9%	148.8	4.9	63.8%

(Source: STECF 2013)

The main discarded by catch species (>5% of total catch) in the Gill net UoC in the North Sea are cod, plaice and turbot, whilst dab is the only minor by catch species that comprises more than a negligible proportion (>1%) of the catch. Spurdog and rays may be vulnerable species that are discarded in significant quantities.

The main discarded by catch species in the Trammel net UoC in the North Sea are plaice, cod, dab and there are no minor by catch species that comprise more than a negligible proportion (>1%) of the catch.

The main discarded by catch species in the Gill net UoC in the Skagerrak are cod, plaice and pollack, whilst dab and saithe are minor by catch species that comprise more than a negligible proportion (>1%) of the catch.

The main discarded by catch species (>5% of total catch) in the Trammel net UoC in the Skagerrak are cod and plaice, whilst the only minor by catch species that comprises more than a negligible proportion (>1%) of the catch is dab.

Set nets have the ability to continue to catch fish for varying periods of time in the event that they become lost, so called "ghost fishing". Gear can be lost in a number of ways – it can become tangled up with mobile gears, can be swept away in extremes of current and or weather, or surface buoys that mark the gears location can become separated from the gear. However, fishermen try very hard to avoid gear loss, as it results in expensive replacement costs, and it is normal for vessels to attempt to recover lost gear it by grappling for it on the seabed. Fishermen are required to record the amount of gear that they leave port with and they must account for it on their return, in the onboard logbooks. In this way it is possible to estimate the total quantity of gear that is lost in set net fisheries, although this does not currently appear to happen.

4.2.4 Long line

Because the Danish long line fishery is a new fishery, there have been no observer trips on these vessels. However, the client has provided the team with some anecdotal data on discards. It is stated that per fishing day up to 5 starry rays can be caught, which probably results in a discard percentage much lower than 5 %. Starry ray is relatively small at first maturity (compared to thornback ray, for example) and demographic modeling suggests this species is less susceptible to fishing mortality than other larger-bodied skate species. For these reasons starry ray is assessed by IUCN as Least Concern in the Northeast Atlantic region.

The team assumes that a limited part of the catch will consist of undersized cod which will be discarded. Cod is a retained species and the impact of discarding on the cod stock is evaluated by the team under demersal trawling.

Note that cod, plaice, Nephrops, haddock and saithe are scored elsewhere in the assessment under P2 (retained species).

Summary of retained and by catch (discard) species

The following table provides a summary of the species that might be regarded as by either main or minor by-catch species for the purposes of this assessment.

Table 4.16. Discarded by catch species by UoC, Skagerrak and North Sea (X = main, + = minor)

SPECIES	TR2 NS	TR2 Sk	TR1 NS	TR1 Sk	Danish seine NS	Danish seine SK	GN NS	GN Sk	TN NS	TN Sk	LL
Anglerfish	(+)	+	(X)								
Cod	(+)	(X)	(X)	(X)		(X)	(X)	(X)	(X)	(X)	(+)
Chimaera monstrosa		+									
Dab	(X)	(+)	+	X	(X)	(X)	(+)	(+)	X	+	
Grey gurnard					X	+					
Haddock		(X)	(+)	(X)	(+)	(+)					
Ling			(+)								
Lemon sole	+	+		(+)							
Nephrops	(X)	(X)	(+)	(+)							
Long-rough dab	+	+				+					
Plaice	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	
Pollack			+	+				(X)			
Rays	+	+			X	X	+				+
Roundnose grenadier		+		(+)							
Saithe		(X)		+				(+)			
Spurdog		+					+				
Turbot							(X)				
Whiting		+	(+)	(+)							
Witch	+	X	TR1 NS	TR1 Sk							

Across the 5 UoCs, in two areas, it appears that a total of 13 species may be considered as main discarded by catch species (anglerfish, cod, dab, grey gurnard, haddock, Nephrops, plaice, pollack, pollack, saithe, rays, turbot and witch), though most of these species are dealt with under retained

species (in 2.1) in particular UoCs that take hake as a target species (indicated by parentheses in Table 4.16).

For the purposes of this assessment, therefore, dab and rays will be considered as by catch species for TR1; lemon sole, long rough dab, rays and witch for TR2; grey gurnard, long rough dab and rays for Danish seines; dab and rays for set nets, and rays for longline.

Although most elasmobranch species are regarded as vulnerable, it is likely that a large proportion of the “rays” by catch is of starry ray (*Amblyraja radiata*), which matures relatively quickly and has been shown by demographic modeling to be less susceptible to fishing mortality than other larger-bodied skate species. For these reasons starry ray is assessed by IUCN as Least Concern in the Northeast Atlantic region. Recent work has indicated that skates and rays have relatively high post capture survival.

Stock status and management information for by catch species is presented against the respective PIs in the scoring table (Appendix 3).

4.3 Endangered, Threatened or Protected Species

Endangered, Threatened or Protected (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.

Most capture fisheries have at least some potential to interact with ETP species, though the interaction profile for each gear type 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 a gear types ETP interaction profile. The present certification includes five different gear types, of which the potential for interaction with ETP species in the North Sea/Skagerrak is considered to be negligible for longline fisheries and at a scale that does not require a more focused management response.

In general, populations of ETP species are well studied in the North Sea and Skagerrak, and there is regular monitoring of fisheries interactions through onboard scientific observers, capture of anecdotal information, focused national study/research programmes and a range of EU-funded research programmes.

Table 4.18 lists the ETP species that have been identified as being relevant to the assessment of Danish North Sea hake fisheries. The inclusion of a species here means that that the assessment has identified a potential for at least one of the units of certification to interact with that species.

Table 4.17 Endangered, Threatened and Protected species, North Sea & Skagerrak

			NORTH SEA ETP SPECIES		
			DK signed 1977	Denmark transposed into national legislation	
<i>Convention instrument</i>	<i>or</i>	<i>legislative</i>	CITES	Council Directive 92/43/EEC	EU Council Reg 57/2011
SPECIES			Appendix II	Habitats Directive Appendix II	
Harbour <i>phocoena</i>	Porpoise	<i>Phocoena</i>			

	NORTH SEA ETP SPECIES		
	DK signed 1977	Denmark transposed into national legislation	
Harbour Seal <i>Phoca vitulina</i>			
Grey Seal <i>Halichoerus grypus</i>			
Angel shark <i>Squatina squatina</i>			
Common Skate <i>Dipturus batis</i>			
Basking shark <i>Cetorhinus maximus</i>			
Spurdog <i>Squalus acanthias</i>			
Allis Shad <i>Alosa alosa</i>			
Sturgeon <i>Acipenser sturio</i>		Priority species	

The assessment team has considered the above list of species in the context of the potential interactions with individual units of certification during this assessment. 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).

4.3.1 Common skate, Spurdog and Allis shad

Demersal trawl, Danish seine and setnet fisheries are known to catch common skate and spurdog from time to time.

The common skate *Dipturus batis* is the largest of the European batoid fish, reaching lengths of 285 cm and weights of 100kg. It is a demersal species and inhabits coastal areas and shelf seas at depths of 85-1000 m. It has declined throughout its range and was formerly widely distributed over much of the North Sea, but is now only found rarely in the northern North Sea (ICES Advice 2008, Book 6: 6.4.30). Common skate 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. Common skate may be landed only where specimens are taken outside of European waters (according to Council Regulation 57/2011). If skate are taken within European waters, they must be returned to the water immediately. 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' (IUCN, 2010).

Until recently landings of all skate and ray species have been amalgamated and reported under the category 'skates and rays' making the determination of individual species decline difficult. Furthermore, species identification can be an issue, especially when they are landed as "wings" only.

Spurdog *Squalus acanthias* were once widely distributed within the North Sea, but has been severely depleted across its range in the north east Atlantic to the extent that it no longer has a TAC (set at 0 t) and there is no provision for cannot be landed even as a by catch. Accordingly, a directed Spurdog fishery is no longer permitted and all spurdog must be returned alive to the sea in EU waters. Spurdog are still subject to the discards ban if caught in Norwegian waters, and have to be landed.

The demersal trawl fishery has also been known to capture Allis shad in the past. However, discard sampling data (2010-2012) do not indicate the capture of Allis shad in the demersal trawl or Danish seine fisheries and it is considered unlikely that the fishery has any significant interaction with shad.

4.3.2 Harbour porpoise

In the North Sea and Skagerrak, the dominant cetacean species is Harbour porpoise. A number of Danish Natura2000 sites are designated on account of significant use of the areas by Harbour porpoise. Interactions between setnet fisheries and Harbour porpoise are well known and there is good information available in order to inform the assessment in a general context of the fishery's possible impact in this regard.

The demersal trawl, Danish seine and longline fishing gears do not have significant potential to direct negative interactions with cetacean species, though moribund individuals (discarded from set net fisheries) may be trawled up from time to time.

Denmark is a signatory to the "Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas" (ASCOBANS) which was concluded in 1991 under the auspices of the Convention on Migratory Species (CMS or Bonn Convention) and entered into force in 1994. The agreement seeks to formalise and coordinate efforts to conserve the small cetacean species shared between member countries in the ASCOBANS Area, conscious that the management of threats to their existence, such as bycatch, habitat deterioration and other anthropogenic disturbance, requires concerted and coordinated responses. 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 focused on mapping small cetacean in North East Atlantic waters (often focusing on the North Sea). A recent notable example has been the Small Cetaceans in the European Atlantic and North Seas project (SCANS & SCANS II).

The Harbour porpoise may not detect the presence of nylon mesh in water (although if their sonar is directed toward the net, detection is more likely) and entanglement risks are high for this species in both gillnet and trammel net fisheries. While there are measures in place that may assist in reducing capture of Harbour porpoise, these are not co-ordinated or designed specifically to address the issue of porpoise bycatch. Estimates available (Vinther and Larsen, 2004) suggest that up to 5,500 individuals were caught annually in Danish setnet fisheries in the North Sea between 1987 and 2001. The actual bycatch of porpoise today is likely to be significantly lower as a result of

- » a major reduction in overall set net effort, due to decommissioning and fleet consolidation;
- » mandatory use of pingers in those fisheries with the highest HP by catch rates;
- » changes to the gear type for which the estimates are based that renders them less likely to catch cetaceans

In the study, it is estimated that the present fishery accounted for between 285 and 501 capture-related mortalities annually.

In 2008, ICES was asked to evaluate the bycatch of harbour porpoises in the North Sea against the Ecological Quality Objective used by OSPAR, which states that bycatch should be kept below 1.7% of the best population estimate. ICES referred to the findings of the SCANS II project for an abundance estimate (239,061 animals in the North Sea), but were unable to provide a complete bycatch estimate, nor state whether overall bycatch was below the 1.7% objective.

EU regulation No 812/2004 lays down measures concerning monitoring of fisheries and measures to reduce incidental catches of cetaceans in gillnet fisheries (EU, 2004). A percentage of fisheries must have observer coverage to report on bycatch incidents for specific gear types. It is noted that this regulation does not require observers on board set net vessels operating within the North Sea.

A number of experiments have taken place using acoustic alarms or pingers to exclude harbour porpoises from bottom-set gill nets, all of which show up to a 90% decrease in harbour porpoise bycatch. Evidence shows that pingers also reduce bycatch of other cetaceans such as common dolphins.

As per EC 812/ 2004 acoustic deterrents must be used in ICES Sub-area IV and Div. IIIa for the following fisheries:

- (a) Any bottom-set gill net or entangling net, or combination of these nets, the total length of which does not exceed 400m during the period 1 August to 31st October and
- (b) Any bottom-set gillnet or entangling net with mesh sizes $\geq 220\text{mm}$ throughout the year.

Part (a) above requires pingers to be used in Sub-area IV and Div. IIIa for nets that are shorter than 400m and therefore likely to be used over wrecks for the cod autumn fishery. Under the regulation however, there is no mandatory requirement for the use of pingers in the setnet fisheries for hake or haddock, which utilise smaller mesh sizes than 220 mm.

4.3.3 Seals

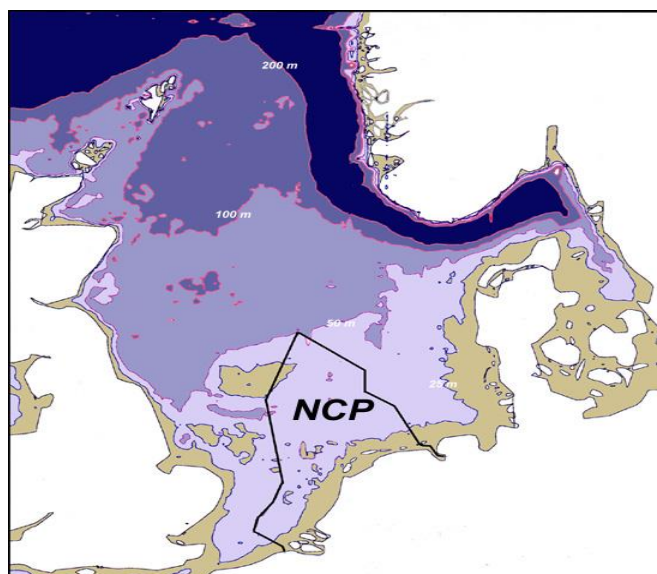
Both Harbour seal and Grey seal are also known to be captured incidentally in both types of mobile gear as well as in the setnet fishery. Limited data available to the assessment team suggest that it can and does occur, though the indications are that it is at a low level relative to seal populations in the North Sea and northeast Atlantic which are known to be increasing.

There are relatively few focused management initiatives in place in relation to all UoCs which specifically address ETP interaction. While individual measures may help to limit problems, there is a need for greater levels of focused and effective management measures that need to be brought together to form a strategy to manage ETP species interactions. It is relevant that the fishery has voluntarily implemented a Code of Conduct that seeks to limit the scope of the fishery with respect to environmental aspects/consequences, by identifying problem areas and creating a context within which a more focused management response can be implemented. Under the CoC, there is requirement for increased levels of recording of ETP species interaction on all certified vessels in ETP Interaction logs. To this end, all vessels now have a wheelhouse guide on board to aid the identification and correct handling and registration of ETP species and vulnerable habitat indicators in catches. The DFPO have compiled information (annually) from these logs, for 2012 and in part for 2013 (e.g. ETP LOG HAKE 2012), which is expected to provide a greater level of information in the future with respect to interactions with ETP. Though the results will not be independent, an obvious shortcoming, it is likely that it will provide additional useful information and is an important initiative in the context of managing ETP.

4.4 Habitats

Figure 4.2 presents an overview of seabed bathymetry for the North Sea. The North Sea can broadly be described as having a shallow (<50 m) southeastern part, which is sharply separated by the Dogger bank from a much deeper (50–100 m) central part running north along the British coast. The central northern part of the shelf gradually slopes down to 200 m before reaching the shelf edge. Another main feature is the Norwegian Trench running in the east along the Norwegian coast into the Skagerrak with depths up to 500 m. Further to the east, the Norwegian Trench ends abruptly, and the Kattegat is of similar depth as the main part of the North Sea.

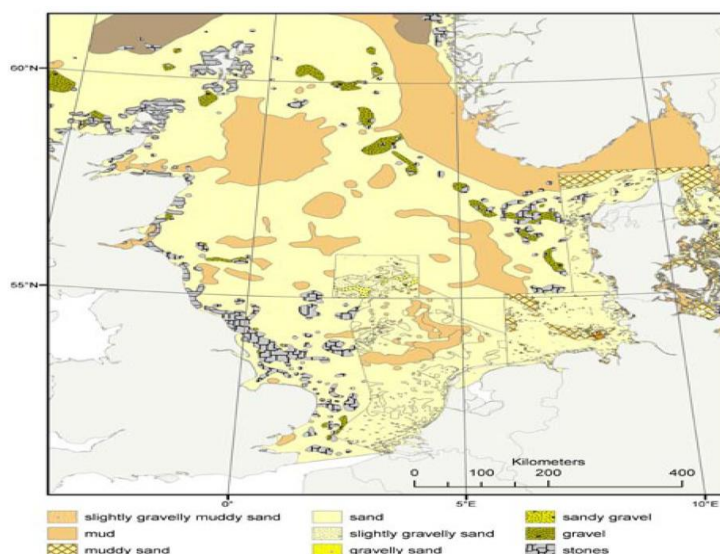
Figure 4.2 North Sea Bathymetry



Source: RIVO, Netherlands

The substrates are dominated by sands in the southern and coastal regions and by fine muds in deeper and more central parts (Figure 4.3). Sands become generally coarser to the east and west, interspersed with patches of gravel and stones. Local concentrations of boulders are found in the north eastern part of the North Sea. This hard-bottom habitat has become scarcer in the shallow southern part, because boulders caught in beam trawls are often brought ashore. The deep areas of the Norwegian Trench are covered with extensive layers of fine muds, while some of the slopes have rocky bottoms. Several underwater canyons extend further towards the coasts of Norway and Sweden. A number of sand banks across the North Sea qualify for protection under the EU habitats directive, mainly along the UK coast, the approaches to the Skagerrak, and the Dogger Bank. Extensive biogenic reefs of *Lophelia* have recently been mapped along the Norwegian coastline in the eastern Skagerrak, while *Sabellaria* reefs have been reported in the south, although their distribution and extent is not known. Gravels also qualify for protection, but comprehensive maps at a total North Sea scale are not readily available.

Figure 4.3 Generalised broadscale seabed habitat of the North Sea.



Source: Digital Atlas of the North Sea

Comparing the above maps with VMS tracks of the client fleet (Figures 4.4, 4.5 and 4.6), it can be seen that much of the fishery occurs on sandy or muddy sand seabeds, while demersal species may also be targeted on slightly more muddy seabeds such as those that occur along the southern edge of the Norwegian Trench; as well as on sandy gravel and gravel or stones to a lesser extent. The fisheries take place almost exclusively in waters less than 200 m deep.

4.4.1 Demersal Trawl

The demersal trawl fishery is concentrated in the Skagerrak and is most intensive during the second and third quarters. The fishery takes place in waters generally less than 200m deep (sometimes quite a bit shallower), mainly within the Danish EEZ but also in part within Norwegian waters, where it occurs on the southern and western edge of the Norwegian Trench. Figure 4.6 presents aggregated data for the hake fishery for the third quarter of 2012.

Figure 4.4 Aggregated VMS records for Danish demersal TR2 trawl fisheries in 2012

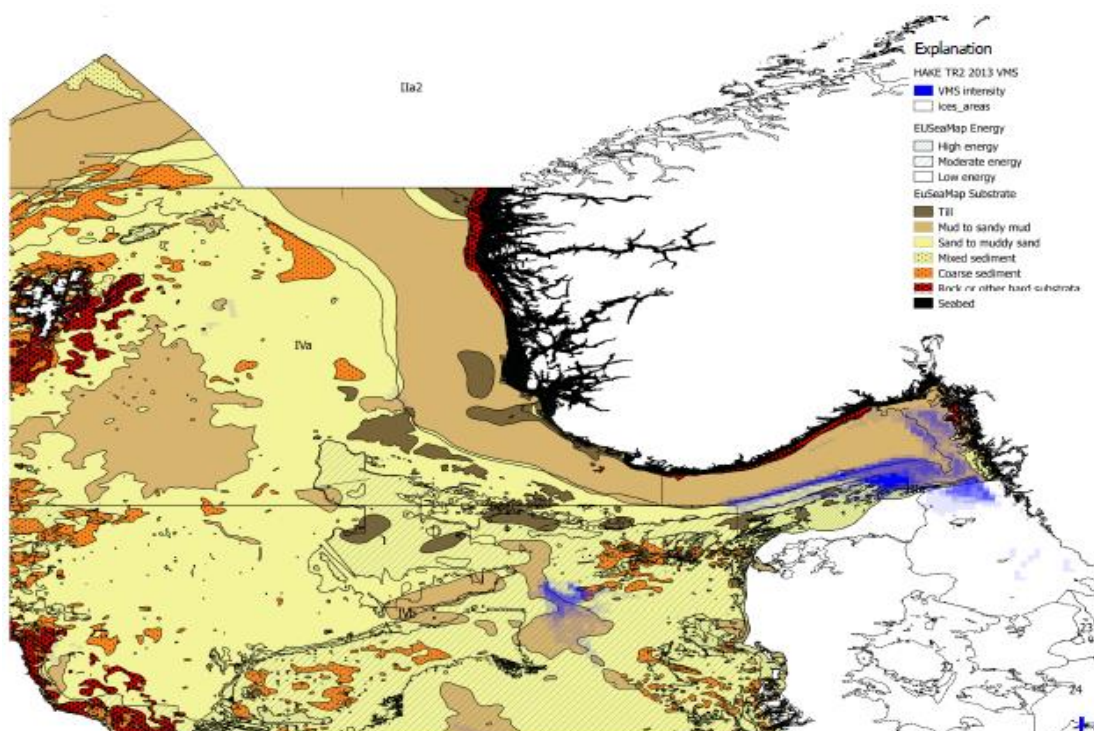
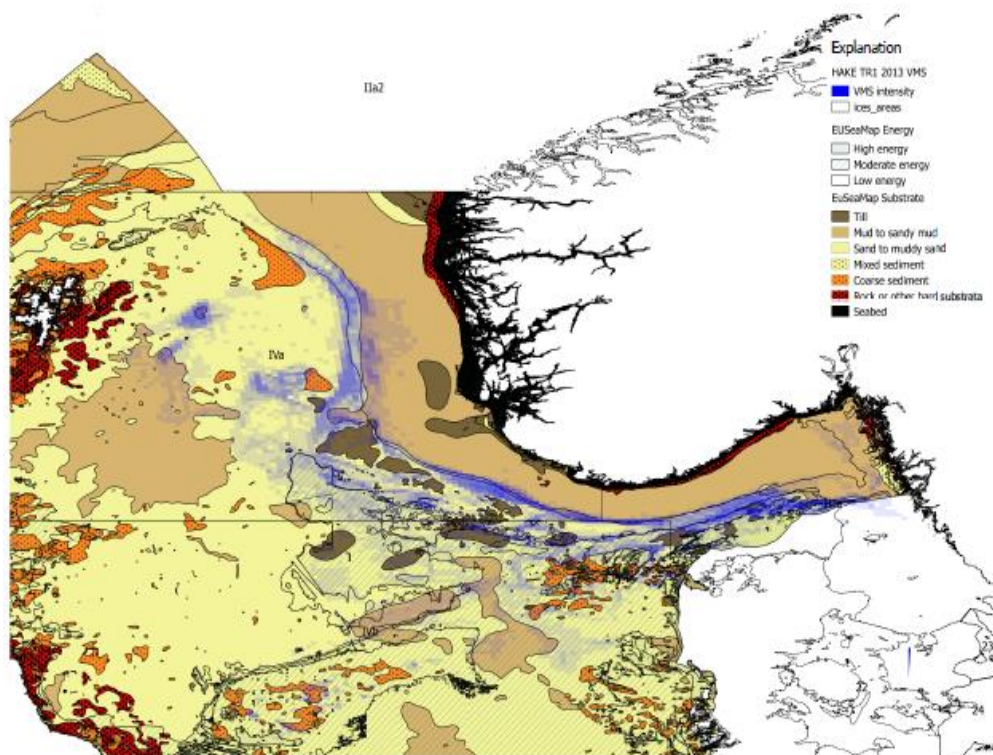


Figure 4.5 Aggregated VMS records for Danish demersal TR1 trawl fisheries in 2012



There is adequate information to indicate that the gear used in the DFPO North Sea and Skagerrak demersal trawl fishery is unlikely to cause serious or irreversible harm to habitat structure and function. There are several sources of information in relation to seabed habitats in the Skagerrak and there is a

good understanding of the habitats where the fishery is most concentrated. There is little if any known interaction with sensitive or vulnerable seabed habitats as defined by OSPAR. Management of potential impacts is facilitated in part through effective monitoring of the spatial and temporal aspects of the trawl fishery, although there could be more comprehensive information in relation to the seabed habitats and communities that may be associated with the areas that are most intensively fished. Available habitat maps for the area tend to be broadscale and may not record all areas of sensitive or vulnerable communities.

Demersal trawling is spatially the most widely distributed means of fishing for demersal species such as hake and haddock. Seabed habitats within this area form a mosaic that is dominated by sands and coarser sediments such as gravely sand, sandy gravel and stones. Some smaller areas of mud and rock may occasionally also occur within the area fished, especially close to the Norwegian Trench.

Mobile demersal fishing gears are known to have significant potential to impact seabed biological communities. Impacts are generally greatest for sensitive communities such as corals, burrowing mega fauna and seapens, all of which may be slow growing and long lived. Maerl and seagrass beds are also considered to be vulnerable to the effects of mobile gears. Long lived and slow growing species tend to be removed by multiple passes of trawls or by the effects of sedimentation as each pass of the net re-suspends sediment which then may settle on and smother sessile fauna. In this way, large, long lived and slow growing fauna may gradually be replaced by smaller, short lived and abundant populations of fast growing organisms which have a greater capacity for recovery through rapid reproduction and recolonisation.

In general habitats that typically are not subject to high rates of natural disturbance from current and/or wave action tend to support more complex communities that are less resilient to physical impacts. Trawling may affect seabed habitats and communities by removing boulders and stones, flattening relief and the reducing the seabed to a flat two dimensional structure. With demersal trawl gears, further impact is associated with the heavy steel trawl doors that are used to keep the net open. These are towed along the seabed and may weigh up to 1200Kg each, while vessels fishing two trawls in a side by side arrangement (twin-rigged) also tow a clump weight or bottom roller along the seabed. On softer seabeds, the heavy nature of the trawl doors and clump weight can result in physical damage to the seabed which may be evidenced by scour tracks that remain detectable using side scan sonar long after a fishing event.

VMS data has been available to the assessment team for the purposes of understanding where and when the fishery takes place. Overall, the evidence indicates that the fishery does not take place in areas that are known to host communities that are vulnerable, rare or particularly sensitive to impacts of seabed trawling. Available data sources consulted included OSPAR, the Searchmesh website (www.searchmesh.net) and Danish seabed mapping information.

Furthermore, for the seabed habitats where the DFPO trawl fishery does occur, recent evidence suggests that the effects of the trawl doors and clump weight used in the fishery do not have a seabed impact on the scale that has been associated with fishing over soft sediments in deeper waters for other demersal species such as Nephrops. Explanations for this include the fact that the predominantly sandy seabed environment where the trawl fishery occurs is subject to higher rates of natural disturbance and the recovery rate for affected benthic communities is known to be more rapid than that for seabed communities associated with other habitats.

The fishery also operates a partial strategy that seeks to minimise the impacts of the fishery on seabed habitats. Following Denmark's commitment to operating within the terms of the CFP, Article 2 of Council Regulation (EC) No 2371/2002 (31) provides that the CFP is to apply the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems. The CFP imposes a range of restrictions and requirements on national fishing fleets and individual vessels which indirectly limit the impact that fisheries may have on EU seabed habitats. Some key elements of CFP fishing rules include:

- » a requirement for all vessels to be registered on the national register
- » all vessels >15 m in length must carry a Vessel Monitoring System (VMS) - a means for monitoring and spatial management of fishing activity of the fleet
- » regulations that set clear limits in terms of fishing effort (KW hours), fishery removals (TAC's, national quotas) and fleet capacity

Under EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, Denmark has created an ecologically-coherent network of protected areas within which the most sensitive and /or vulnerable habitats and species are protected. At the time of this assessment, Denmark has designated a number of areas in the North Sea for the presence of Annex I seabed habitats (including *Reef* and *Sandbanks which are slightly covered by seawater at all times*). These designations represent the first steps in the protection process and Denmark is currently implementing the next steps under the Habitats Directive which will require the preparation and implementation of appropriate fisheries management plans and measures in order to protect qualifying interests in designated Natura 2000 sites. It is a notable consideration that VMS data for Danish North Sea/Skagerrak demersal trawling vessels reveal that these vessels do not fish on the Dogger Bank, which is one of the largest Natura 2000 designated sites in the North Sea.

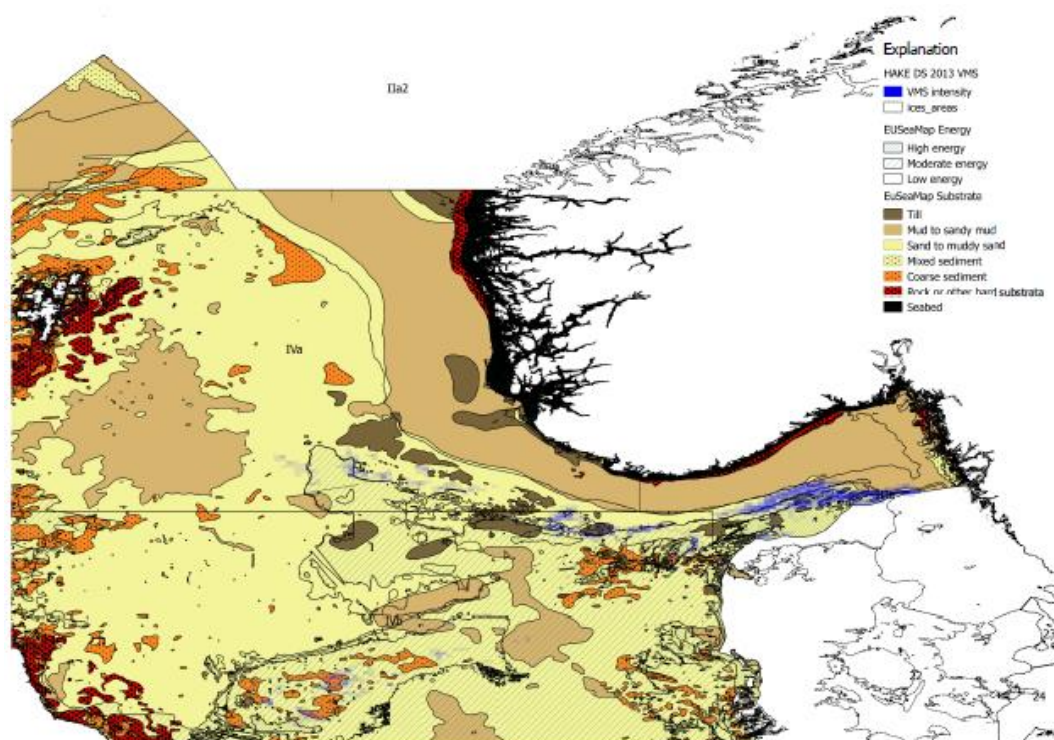
As part of national policy to ensure viability of the fleet and continued protection for resources, Denmark introduced a system of individual transferable quotas to its fishery management system in January 2007. The new management system brought about a rapid contraction of the fleet which has resulted in large-scale decommissioning and much reduced fishing capacity and fishing effort in recent years. With this reduction in vessel numbers, it is expected that the intensity of demersal trawling will decrease further in time, thereby reducing trawling pressure and any associated impacts on seabed habitats.

4.4.2 Danish Seine

Danish seine fishing effort is most intensive during quarters 2 and 3, and Figure 4.6 shows aggregated effort for second quarter of 2009. The fishery is located almost exclusively within Danish waters of the Skagerrak, typically in water depths less than 150m. Seabed habitats in these areas are characterised by a mosaic of mainly sandy gravel and gravel sedimentary habitats. Areas of stones are also evident close to some of the areas fished by Danish seine. As a means of fishing, Danish seine netting permits smaller areas to be targeted, e.g. patches of clear ground lying between areas of rocky or stony seabed in areas that are not suitable for trawling.

Impacts from Danish seine net fishing operations are less severe than those associated with demersal trawling, as there is no need for the heavy trawl doors or the clump weight or bottom roller used in twin rig arrangements. The main impact is associated with the passage of the seine ropes over the seabed. These serve to retrieve the net but also have an important function in herding fish into the path of the net by creating a visual and acoustic stimulus as the ropes begin to close. Sediment may become re-suspended while the ropes may damage or destroy sensitive seabed fauna.

Figure 4.6 Aggregated VMS records for Danish seine fisheries where at least 10% of the catch was of hake. 2012



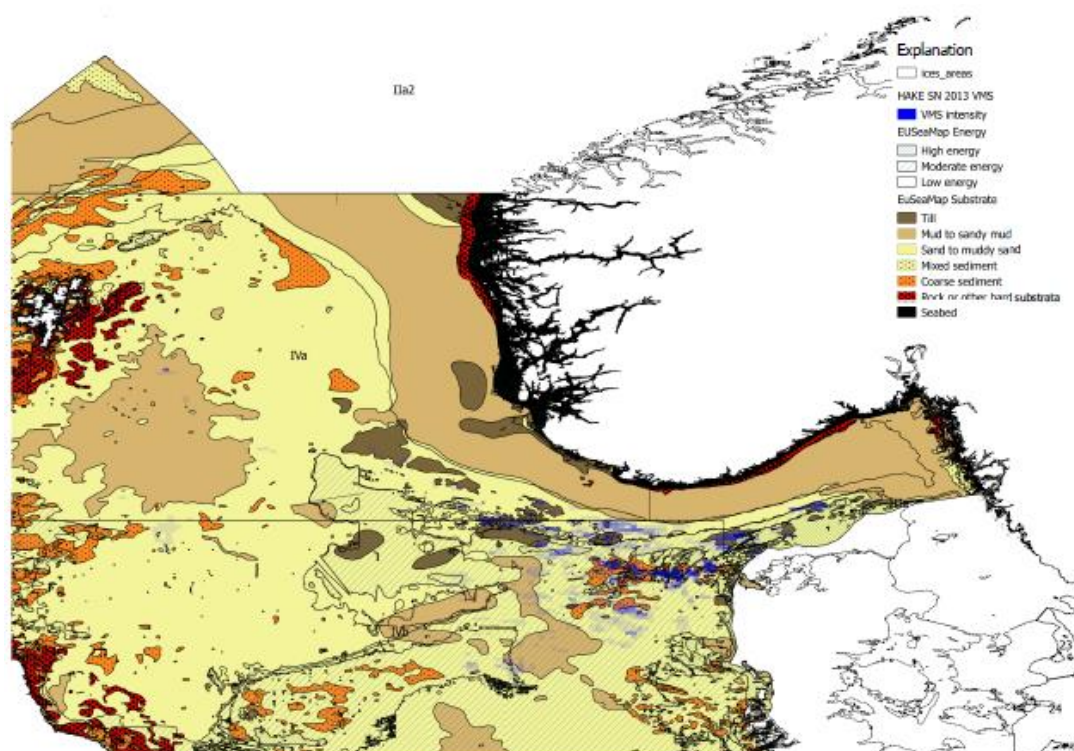
4.4.3 Setnet

Figure 4.7 shows aggregated setnet fishing effort for second quarter of 2009. The setnet fisheries are concentrated in several small areas adjacent to the eastern Jutland coast and to a very small extent, in the Skagerrak. The fisheries occur on sandy and sandy gravel seabed types and generally in waters less than 100 m deep.

Set gill nets have little interaction with the habitat and, given the nature of the gear and the substrates where it is most commonly deployed, they are highly unlikely to reduce habitat structure or function to a point where there would be serious or irreversible harm. These nets are static, lightweight and are only set for relatively short periods, avoiding extremes of tide and weather, and areas of fouling macroalgae. The nets are anchored to the sandy or sandy/gravel seabed by a small (~25kg) four-fluke fisherman's anchor, at either end, and at intervals of a few hundred m when nets are linked. Gear dragged across the seabed during hauling is minimized as the vessel slowly moves forward in the direction from which the gear is being retrieved. Associated habitat impact is considered to be minimal.

Due to the relatively fragile nature of the gear, fishermen actively seek to avoid areas where there is an immediate risk of entanglement with seabed habitats or debris such as wreckage etc. They also restrict their netting activities to areas that are not trawled and where there is relatively little risk of entanglement. This strategy has clear benefits in terms of minimising gear loss and negative habitat interactions.

Figure 4.7 Aggregated VMS records for setnet fisheries where at least 10% of the catch was of hake. 2012



4.4.4 Longline

Long line fishing activity is generally regarded as having a low potential to impact upon benthic habitats. At time of assessment, there were <5 vessels engaged in the longline fishery, although there seemed to be increasing levels of interest in this gear. Based on knowledge of the number of vessels involved, gear characteristics, fishing operations and the type of ground that the fishery mainly takes place over, the impact of the fishery on seabed habitats is believed to be negligible. It is very likely that shifting effort from trawl gears to long lines could significantly reduce fishing related impacts to habitats and seabed communities.

Please note: The Longline Unit of Certification has since been removed from the assessment following the granting of a variation by the MSC.

4.5 Ecosystem

There is considerable knowledge of the habitats and ecosystems of the North East Atlantic, drawing on more than one hundred years of monitoring and research, the intensity of which has accelerated in recent decades. Food webs and trophic relationships of the North Sea are the subject of ongoing research and investigation, the results of which inform the working and study group reports of the International Council for the Exploration of the Sea (ICES). Efforts to improve and refine the science which underpins the fishery management systems applied in European waters has intensified in recent years as Europe has made a commitment to applying the precautionary approach, taking into account all ecosystem impacts of fisheries, in deciding on future management systems and structures.

There is a good level of information on the trophic position and role of various life history stages of most demersal species within the North Sea food web. Many studies that have examined the fish community structure in the North Sea confirm that adult hake are a top predator in the North Sea, while juvenile hake may be a prey species for other gadoids. ICES provide an annual overview of the state of the North Sea Ecosystem, which has been an important source in scoring this fishery in relation to ecosystem impacts.

In managing potential habitat and ecosystem impacts, industry and management authorities are guided by Danish commitment to a number of relevant conventions and European Directives, such as:

- » **OSPAR Biological Diversity and Ecosystems Strategy** is concerned with all human activities that can have an adverse effect on the protection and conservation of the ecosystems and the biological diversity of the North East Atlantic. The Strategy (i) sets ecological quality objectives in support of the ecosystem approach to the management of human activities, and requires (ii) assessments of species and habitats that are threatened or in decline, (iii) development of an ecologically coherent network of marine protected areas and (iv) assessment of human activities which may adversely affect ecosystems and the development of programmes and measures to safeguard against such harm.
- » **ASCOBANS** was concluded in 1991 as the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas under the auspices of the Convention on Migratory Species (CMS or Bonn Convention) and entered into force in 1994. Denmark is a signatory nation.
- » **Council Directive 79/409/EEC** of 2 April 1979 on the conservation of wild birds Directive 1979 and its amending acts aim to provide long-term protection and conservation of all bird species naturally living in the wild within the European territory of the Member States (except Greenland).
- » **Council Directive 92/43/EEC** on the conservation of natural habitats and of wild fauna and flora came into force on 21 May 1992. Its central aim is to conserve biodiversity across the area of the European Union through a coherent network of Special Areas of Conservation (SACs).
- » The **Convention on Biological Diversity** was signed at the UN Rio Conference on Environment and Development (1992). This aims to conserve biological diversity, encourage sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of these resources.

Through its representative organisation, the DFPO, the Danish fishing fleet (demersal trawl, Danish seine, setnet and longline vessels) which are the subject of this assessment report, has recently implemented a Code of Conduct for all member fishing vessels that wish to part take in the MSC certification. The CoC includes reference to limiting wider ecosystem and environmental impacts, for example through changes to fishing practices and more general 'housekeeping' issues such as proper waste disposal procedures, procedures for dealing with hazardous waste. The CoC generally aims to increase awareness and encourage responsible behaviour amongst fishermen, in order to minimise impacts of the fisheries on the wider ecosystem.

5. Administrative context (P3)

Principle 3 of the Marine Stewardship Council standard states that:

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

The following section contains a brief description of the key characteristics of the management system that is in place to ensure the sustainable exploitation of the fishery under assessment.

5.1 Governance & Policy

5.1.1 Legal & Customary Framework

EU

Denmark accepted the provisions of the EU Common Fisheries Policy (CFP) when it joined the EU in 1973. The main principles of the CFP were agreed and implemented in its current format in 1983. A full review in 2002 resulted in the basic fisheries regulation (EU2731/2002), which is itself presently under review. The revised policy is expected to adopt significant changes to discarding and coastal state management, whilst retaining the original principle of 'equal access' to Member States' waters. CFP regulation concentrates on 4 main categories- Structural Measures, State Aid, Management of the Resource and Organisation of the Market. It extends to conservation, management and exploitation of fisheries resources, aquaculture, and the processing, presentation and marketing of fisheries products.

Although policy for implementation of much legislation introduced under the CFP is devolved to Member States, the European Commission is making increasing efforts to ensure that CFP legislation is evenly and fairly implemented across the EU. The creation of the Community Fisheries Control Agency (CFCA) is part of this and, in recent years, the Commission has been increasingly willing to take infraction proceedings against Member States that do not abide with legislation, leading to major fines, for example, for failure to adhere to national shares of quota.

EU legislation dealing with related issues such as the Habitats Directive falls outside the CFP.

National

Implementation of the CFP at a national level is carried out through the individual Member States. In Denmark responsibility for fisheries management, legislation and policy lies with the Ministry of Food, Agriculture and Fisheries (established by Royal Decree in December 1996).

The main Danish enabling legislation is the 1999 Fisheries Act (Act No. 281 of 1999, consolidated as LBK No. 978 of 26 September 2008), which makes provision for the management of fisheries for purposes of protection and enhancement of living resources in marine and freshwater and for the protection of other marine animal and plant life, to safeguard the basic foundations of commercial fishing and related commercial activities and sport fishing.

5.1.2 Consultation, Roles & Responsibilities

There are several relevant organisations and bodies that take an active role in the fishery under assessment. Their roles are well understood and the interaction between them works effectively.

Industry Representation

The Danish fishing industry is generally well organised, and there are several tiers of industry representation which form a crucial role in providing the industry with an effective voice in both management and science. They also play an important and effective role in lobbying. Although the Danish FPO has an important role to play within the industry, DFPO members are also represented by the Danish Fishermen's Federation, which takes the lead in representing the catching sector both nationally and internationally.

The Danish Fishermen's Association was established in 1994 when the two former fishermen's organisations "Danmarks Havfiskeriforening" and "Dansk Fiskeriforening" merged and it now

represents around 50 local fishermen's organisations. The Danish Fishermen's Association represent the interests of Danish Fishermen at Regional Advisory Councils.

The creation of Regional Advisory Councils (RACs) was one of the pillars of the 2002 CFP reform, in response to the EU and stakeholders' desire to increase the latter's participation in the CFP process. The RACs can submit recommendations and suggestions on any aspect of fisheries in their area to the EC or relevant national authorities. The RACs are made up of representatives of the fisheries sector and other groups (including environmental NGOs) with scientists playing an important and active advisory role. More recently, RACs have been able to request that work be undertaken by scientists, to enable them to provide subsequent advice to the RAC. The Commission and civil servants from Member States may be present at the meetings as observers. The RAC relevant to this assessment is the North Sea Regional Advisory Council, which includes a working group on Demersal Stocks, although Northern Hake is dealt with in the Western Waters RAC where the majority of the stock, and fishery, is found.

Fishing crew members are typically represented by the transport section of the United Federation of Danish Workers, a member union of the Danish Confederation of Trade Unions (LO). The confederation is the largest central organisation for workers on the Danish labour market, with more than 1.3m members (of LO's affiliated unions across all Danish industry) constituting approximately 50 % of all workers in Denmark.

Scientific Advice

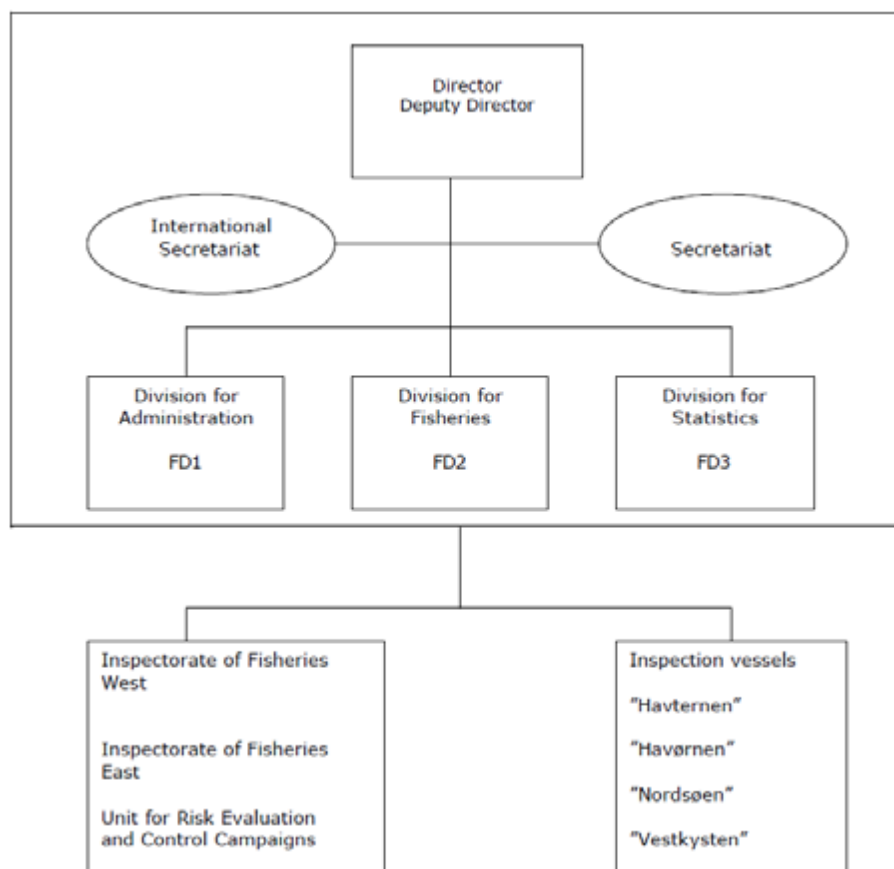
The core advice for the management of this fishery is provided by the ICES Advisory Committee (ACOM), which draws on the work of international scientists from research laboratories and institutions on hake biology, stock dynamics and marine science. The main working group responsible for providing advice on Northern Hake is the Working Group on widely distributed and migratory stocks.

The Danish Technical University (DTU Aqua) provides the statutory national scientific role in terms of fisheries. The purpose of DTU Aqua is to "provide research, advice and education at the highest international level on the sustainable exploitation of living marine and freshwater resources, the biology of aquatic organisms and the development of ecosystems". DTU Aqua carries out research and provides advice on fish and shellfish population biology, stock status, dynamics and interaction with other organisms. Several DTU Aqua staff are members of ICES working groups.

National Management Bodies

Within the Danish Ministry of Agriculture, Food & Fisheries, responsibility for administration, regulation, enforcement and inspection lies with the Danish AgriFish Agency, which comprises a central unit based in Copenhagen with 65 members of staff. The Agency is represented in various international committees, working groups in the EU and other international institutions. One important responsibility is to maintain statistics on fisheries in Denmark and to report these to the EU and other international institutions. In addition, there are three fisheries inspectorates with 115 members of staff and four fisheries inspection vessels with 80 members of staff, which are responsible for undertaking all control and enforcement activities in Danish waters and ports. Responsibility also extends to all aspects of compliance and control, including landing inspections, including inspections of fish landings and logbooks, maintaining VMS, e-logbooks and e-sales notes systems and to ensure that all other EU and national legislation is observed.

Fig 5.1: Organisational structure of the Danish AgriFish Agency



Source: [www. http://www.fdm.dk](http://www.fdm.dk)

Within Denmark, the Fisheries Development Committee gives advice in matters related to the use of European Fisheries Fund (EFF) structural funds, priorities and mechanisms. Fishermen are represented on this Committee and have substantial input into its policy.

The EU Committee (Paragraph 5 in the Danish Fisheries Law) is consulted in all matters related to the CFP and EU fisheries regulations. DFPO members are represented on this Committee.

The 'Paragraph 6' Committee is also statutory and must be consulted in all matters related to regulation of Danish commercial fisheries. DFPO members are similarly represented here.

Consultation with environmental NGOs appears to be more informal and they have no statutory role in the Committees mentioned above.

5.1.3 Objectives

The 2002 reform of the European CFP aimed at delivering, amongst other objectives:

- » efficient fishing activities within an economically viable and competitive fisheries industry;
- » the sustainable development of fishing activities from an environmental, economic and social point of view;
- » a fair standard of living for those who depend on fishing activities and taking into account the interests of consumers;
- » ensure sustainable exploitation of living aquatic resources;
- » a precautionary approach to protect and conserve living aquatic resources; and
- » to minimise the impact of fishing activities on marine ecosystems.

More recently, the Commission has asked ICES to provide quota advice based on an aim to achieve MSY, rather than the previous 'precautionary' approach based on SSB reference points.

In addition to the CFP, high level EU objectives are enshrined in other strategy documents such as the EU Sustainable Development Strategy, adopted in 2006, which includes a stated objective of:

'Improving management and avoiding overexploitation of renewable natural resources such as fisheries..... restoring degraded marine ecosystems by 2015 in line with the Johannesburg Plan (2002) including achievement of the Maximum Yield in Fisheries by 2015'.

In 2008, the EU Marine Strategy Directive was adopted which commits members states to further foster the integration of environmental concerns into other relevant policies, such as the CFP in order to achieve 'good environmental status' in the marine environment, through the development and implementation of national level policies based on an ecosystem approach, in order to meet the following targets by 2020:

- » populations of all commercially exploited fish and shellfish must be within safe biological limits, exhibiting an age and size distribution that is indicative of a healthy stock;
- » all elements of the marine food web must occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity;
- » biological diversity must be maintained and the quality and occurrence of habitats, and the distribution and abundance of species, are to be kept in line with prevailing conditions; and
- » sea floor integrity is maintained at a level that ensures the safeguarding of structure and functions of the ecosystems.

The DFPO Code of Conduct includes objectives that are aiming at achieving the outcomes expressed by the MSC Principles 1 and 2 (DFPO paragraphs 1, 3, 5, 6, and 7). However, it does not report on the success, or otherwise, of these.

The objective within the Northern Hake management plan (Reg 2009/0039) agreed by the Fisheries Council in 2009 is

“(a) to maintain the biomass of the hake stock at a level that allows its sustainable exploitation on the basis of a target fishing mortality rate that will allow the stock to produce the maximum sustainable yield, and

(b) to provide for the management of that stock in order to maintain it above the precautionary biomass level.”

5.1.4 Incentives

In spite of significant reform and improvement of the European Fisheries Fund in EU regulation 1198/2006, incentives for the industry to move to more sustainable fishing methods and practices remain poor. Rather than the use of public funds, the most effective recent incentive to reduce overall

fishing effort within the Danish fleet, and the DFPO vessels in this certification, was the move in 2007 to individual vessel quotas. This rapidly led to individual catching opportunities significantly increasing, against a backdrop of a rapidly shrinking fleet.

The Green Paper on the latest Reform of the CFP in 2012 recognised the need for more positive incentives and has increased the emphasis on possible measures to encourage the industry to take more responsibility for sustainable operational practices and to require this to be demonstrated in order to gain access to fisheries.

The increasing number of vessels volunteering to operate with CCTV on board, in exchange for increased fishing opportunities, demonstrates the success of this measure. If the Commission brings in new regulations banning discards, currently under discussion, and creating 'catch quotas', this should prove to be an even greater incentive to fish more selectively. The current use of CCTV, where the Fiskeridirektoratet aims to monitor 10% of all recordings, should provide much better data on discarding and bycatch than is currently provided by on board observers, who managed less than 1% coverage in 2010, with the majority of this on board vessels landing significant quantities of cod.

The hake management plan makes specific reference to the use of the EFF, meaning that funds are eligible to assist restructuring in the fishery. The Plan also contains a number of 'negative' incentives to illegal fishing practices, applies a number of additional control measures to vessels that have hake on board, and extra responsibilities on Member States to monitor and enforce these.

5.2 Fishery Specific Management System

5.2.1 Compliance & Enforcement

There is a high degree of enforcement and control in the Danish fisheries sector. The Danish Directorate of Fisheries is responsible for all enforcement, both at sea and on landing. Inspections also occur throughout the sales and supply chain to ensure that all fish handled is legally caught. Since 2007 it has had a risk-based enforcement strategy in place. Landings with significant components of cod are a higher priority than other demersal landings.

According to the Danish Fisheries Inspectorate, at sea inspections of Danish fishing vessels operating in the North Sea during 2008 amounted to 124 inspections of netters, 35 seiners and 121 demersal trawlers. A high rate of compliance with regulations is reported as a result of the inspection programme. The numbers of vessels inspected was at least in accordance with target levels of inspection set by the Inspectorate (the target for 2008 being 124, 35 and 120 inspections respectively). No targets, however, are set for inspection and compliance with measures required to avoid cetacean and other ETP bycatch.

A total of 4,300 compliance checks were made in 2009, from 94,000 landings. Of these checks, 8.6% were found to have some sort of compliance problems, but the 'vast majority' were due to fishermen making minor errors on logsheets or landings notifications.

There is good system of monitoring quota uptake, based around the use of electronic logbooks for vessels of 12m and above, and from under 10m vessels that must also submit landings declarations, cross referenced with sales notes from auction or first sale. Strategic spot checks ensure the accuracy of these figures. Typical inspections at sea include logbook and licence verification, measurement of fishing gear, and catch inspection. Such activity forms the backbone of the CFP Monitoring Control and Surveillance (MCS) system, and performance of this system against national and CFP targets, including details of infringements and prosecutions, is reported on an annual basis. These activities are coordinated through the new EU Fisheries Control Agency.

The Fisheries Directorate will pass any report of infringement or non-compliance to the public prosecutor, who determines the exact scale of sanction which typically results in a fine.

Overall there is a high degree of confidence in the enforcement system and no evidence of systematic non-compliance.

The DFPO Code of Conduct makes provision for sanctions against members who fail to comply with it.

The hake management plan contains a number of additional control measures that apply to vessels with hake on board. These include a reduction in the margin of tolerance for recording hake on board to 5%, a requirement to store hake separately from other species, a requirement to notify authorities

prior to landing, and to land significant quantities of hake in specified ports only. Member States are also required by the plan to report to the Commission on the success of their control measures.

5.2.2 Decision Making & Dispute Resolution

All EU member states (including Denmark) have signed up to CFP, and are therefore bound by European legislation. The European Commission is a politically independent, civil service which lies at the heart of the European Union legislative / decision-making process. The Directorate-General for Maritime Affairs and Fisheries (DG Mare) is the administrative department of the Commission with responsibility for fisheries. The Commission is responsible for the preparation of proposals for new laws, which, once adopted by the Commissioners, are sent to The Council of the European Union.

The Council is made up of elected national representatives, generally fisheries ministers. The Council makes Community laws, after reviewing proposals of the Commission, and depending on their nature, after consulting with various committees and The European Parliament.

The European Parliament is composed of elected representatives from the Member States. Their role is to contribute to the Community's legislative process, to ensure that the Commission makes proper use of its power and, with the Council, to take decisions over the Community budget.

When drafting legislative proposals, DG Mare consults widely, including with, relevant groups, third countries and regional fisheries organisations. DG Mare may request special studies and consult with other Commission departments, such as those responsible for environment or regional policy to ensure harmonised community laws. Additionally, various committees consisting of representatives of the Member States, industry and science have been set up to assist in the implementation of the CFP by providing advice to DG Mare on proposed legislation. The commission provides a secretariat for these committees.

The implementation of the CFP requires the assistance of highly qualified scientists, particularly in the fields of marine biology, marine ecology, fisheries science, fishing gear technology and fishery economics. The members of the Scientific, Technical and Economic Committee on Fisheries (STECF) are nominated by the Commission and serve a renewable 3 year term.

The opinion of STECF is crucial in the process of setting annual TACs and quotas, and developing long-term management plans. The STECF produces an annual report on the situation as regards fisheries resources and on developments in fishing activities. It also reports on the economic and socio-economic implications of the fishery resources situation.

Advisory Committee on Fisheries and Aquaculture (ACFA)

The implementation of the rules of the CFP requires that the opinion of relevant stakeholders is taken into consideration. ACFA was established in 1971 (renewed in 1999) and is today composed of 21 members representing the catchers, processors and fish traders as well as organisations representing the interests of consumers and the wider marine environment.

The European Commission (DG Mare) then has responsibility for implementation, management and control of community law in Member States. Where appropriate, European legislation is enacted at the national level through relevant primary and secondary legislation.

The annual decision on national quota allocations for the forth-coming fishing season provides an indication of the how the European decision-making process works. The ICES working groups with responsibility of stock assessment submit assessments to ICES ACOM, who in turn review and

disseminate advice on stock status and catch options to the European Commission (DG Mare). This advice is reviewed by STECF before preparing recommendations for the Commission.

This process is facilitated by the RAC structure and ACFA will typically also contribute to this consultation process. The Commissioners then pass recommendations to the Council, where fisheries ministers finally make a decision.

From a Danish perspective, input is provided into the decision-making process at a number of levels – in forming the original advice (ICES), in reviewing the advice (STECF) and in preparing final recommendations (Commissioners) and, finally, in taking decisions (Council).

Disputes between Member States and the Commission are resolved in the Council of Ministers. The Hake Management plan makes the annual setting of the Northern Hake TAC less vulnerable to political dispute, but in the event of significant disagreements the TAC can be set by majority voting within the Council. Outside the machinery of government, there are a wide range of institutional solutions to dispute resolution – through trade organisations, professional associations, and a range of decision-making bodies (at local, regional and national levels).

Bilateral negotiations between the EU and Norway are carried out in parallel with internal EU consultations. Although significant problems have occurred in co-managing other stocks, most notably Western Mackerel with Iceland and Faroe, it has been highly unusual for disagreement with Norway to delay the EU decision-making process.

6. Background to the Evaluation

6.1 Assessment Team

Assessment team leader: Antonio Hervás (originally)

Responsible for assessment under Principle 1

Dr. Antonio Hervás is Food Certification International Fisheries Development Manager. He is an established Fisheries Scientist specialising in quantitative stock assessment methods and the design of management strategies for the sustainable exploitation of the fish resources. Dr. Hervás holds a BSc in Marine Sciences, a Higher Diploma (postgraduate course) in Fisheries Management, Development and Conservation and a PhD in the development of stock assessment procedures. From 2001 to 2008 he worked as a fisheries scientist for the assessment on mollusc stock of Ireland at Trinity College Dublin and at the marine Science-MRI at the National University of Ireland, Galway. During this time Dr. Hervás was an active member of the National Shellfish management Framework with responsibilities on providing scientific advice on the status of mollusc stocks for their management. During this time Dr. Hervás published an extensive number of peer reviewed papers, technical reports and has acted as peer reviewer for the ICES Journal of Marine Science. From 2009, Dr. Hervás acted as Team Leader and Principle 1 expert against the MSC standard.

Assessment team leader: Mike Pawson (currently)

Responsible for assessment under Principle 1

Dr Mike Pawson retired as senior fisheries advisor at Cefas, Lowestoft, after 39 years carrying out biological research and providing scientific advice to Defra, the EC and other national and international organisations on fish stock abundance, technical conservation measures and fisheries management regulations, and on related monitoring, sampling, survey and research programmes. Between 1974 and 1980 he initiated and led acoustic surveys for blue whiting and mackerel, and trawl surveys in the North Sea and, from 1980 to 1990, designed and managed MAFF's coastal fisheries programme, implementing biological sampling, trawl surveys, a fishermen's logbook scheme and socio-economic evaluation of sea bass fisheries. Between 1990 and 2002 Mike led the Cefas Western demersal team, providing analytical assessments and management advice for 12 finfish stocks including hake and, since 2002, directed and managed the assessment of salmon and eel stocks in England and Wales and provided scientific advice on their conservation.

During this time he was co-ordinator of the Anglo-French English Channel Fisheries Study Group (1989-1997), and chaired the ICES Southern Shelf Demersal Stock Assessment Working Group (1996-98), Seabass Study Group (2000-04) and Elasmobranch Study Group (2001-02), and scientific and technical meetings for the EC's hake recovery plan (2000). He initiated and managed EU-funded multi-national projects on methods for egg-production stock biomass estimation, bio-geographical identity of English Channel fish stocks, bio-economic modeling of Channel fisheries, development of assessment methods for elasmobranchs and eels, and on marine recreational fishing. Since his retirement from Cefas in 2007, Mike has taken part in 12 Marine Stewardship Council fishery assessments.

Mike has provided scientific evaluation, quality assurance and advice to several national and EC-funded projects on fisheries biology, monitoring and assessment, and one of his major roles over the last 15 years has been peer-reviewing scientific papers, project proposals, reports and manuscripts in preparation, and 40+ MSC assessments. All of Mike's work has been published in refereed Journals, in ICES and EC working group reports, and in contract reports.

Expert team member: Mr Nicholas Pfeiffer

Responsible for assessment under Principle 2

Nick Pfeiffer is a fisheries and marine environmental consultant with a diverse experience and in-depth knowledge of Irish marine fisheries. Nick's experience as a fishery scientist spans ten years and includes the development of fisheries technical conservation measures for commercial fisheries as well as the evaluation of the impacts of a variety of fishing methods on marine ecosystems.

Nick has written management plans for 8 marine Special Areas of Conservation in Ireland on behalf of Ireland's National Parks and Wildlife Service since 2003. He has managed and conducted an extensive 5 year programme of field studies into the distribution and abundance of sensitive subtidal communities

in 16 marine SAC's in Ireland and the UK (Northern Ireland) since 2004. Through MERC Consultants, Nick managed a series of Appropriate Assessments in relation to capture fisheries (mussel dredging) and aquaculture in marine SAC's in Ireland and is also very active in conducting benthic environmental auditing of intensive finfish aquaculture sites in Ireland, according to the Irish Benthic Monitoring Protocol. Nick provides specialist benthic ecological assessment services in respect of aquaculture licence appeals process to the Aquaculture Licence Appeals Board. In this context NP has carried out assessments in relation to extensive bivalve cultivation licences within NATURA 2000 sites. In the context of marine conservation biology, NP is also a member of the National Platform for Biodiversity Research. This is a forum for scientists, policy makers and other interested stakeholders involved in the field of biodiversity research in Ireland.

Expert team member: Mr Andrew Read (originally)

Responsible for assessment under Principle 3

Andy Read is currently Director of Fisheries in the Isle of Man. A week after graduating with a degree in marine biology he started out as a 'deckie learner' in the Isle of Man scallop fleet, before working in Australia and Scotland on larger vessels, and eventually owning his own potting vessel. After 8 years at sea he took a Masters degree in Fisheries Science at Aberdeen University, and following a brief spell in Washington DC working on fisheries policy, took up a post as Assistant Chief Executive of the National Federation of Fishermen's Organisations, based in Grimsby. He remained in Grimsby as secretary of a large Fish Producer's Organisation, the North Sea Fishermen's Organisation, for a further 5 years, before returning to the Isle of Man. During the 5 years with the NSFO he also worked as a consultant on a number of fisheries projects, including ones for the European Parliament Fisheries Committee, European Commission, Government of Malta and a variety of offshore energy developers. As Director of Fisheries in the Isle of Man, Andy Read has overseen a large number of changes within the industry, developing a conservation regime, underpinned by scientific advice that has seen the Isle of Man Queen Scallop fishery successfully apply for MSC accreditation.

Expert team member: Mr Don Aldous

Responsible for assessment under Principle 3

Don Aldous has been involved in fisheries management issues in Canada and the Pacific Islands since 1977. He has experience at all levels of fisheries management from Fishery Officer to Commissioner of a Regional Fisheries Management Organization. In Canada, he achieved a Senior Advisor position in matters dealing with foreign and domestic fisheries management. In the Pacific Islands, he served as the first MCS Officer of the Forum Fisheries Agency in 1986-88 and returned to the Pacific to conduct project work since 2001. He led teams of consultants preparing fisheries management plans for Fiji, Solomon Islands and Marshall Islands and has returned to conduct follow-up work in all three. On a regional scale, he has provided advice to FFA on issues related to fisheries management, development and MCS.

Expert advisor: Paul Macintyre

MSC Chain of Custody and Traceability specialist / Lead Auditor

15 years management experience within the aquaculture and fish processing sectors. 20 years experience auditing ISO, HACCP, BRC, GlobalGAP, organic and conventional farming operations within the aquaculture production and fish processing sectors and including MSC Chain of Custody since 2005. ISO 9001 Lead Auditor (QMI 1991); Registered Organic Inspector (DEFRA); Diploma in Advanced Food Hygiene (Queen Margaret University Edinburgh); BRC v5 Food Manufacturing Auditor BRC (London and Manchester); GlobalGAP IFA Trainer (GlobalGAP Cologne) ; RYA Yachtmaster Offshore (RYA Southport) ; Diploma Photography (Photography Institute)

6.1.1 Peer Reviewers

Peer reviewers used for this report were Eoghan Kelly and Patrick Sullivan. A summary CV for each is available in the **Assessment downloads** section of the fishery's entry on the MSC website.

6.2 Public Consultation

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

Table 6.1: Public Consultations

05.01.11	Notification of Commencement of Assessment	MSC website
05.01.11	Nomination of Assessment Team Candidates	MSC website
Throughout	Solicitation of Inputs to Stakeholder Consultation and Assessment	email, phone and mail
20.01.11	Announcement of Assessment Tree and Scoring Guideposts	MSC website
27.01.11	Announcement of Assessment Visit and Convening of Stakeholder Consultation Meetings	direct email, MSC website
14-28.03.11	Assessment Visit	MSC website
TBD	Notification of Proposed Peer Reviewers	MSC website
TBD	Notification of Public Comment Draft Report	MSC website
TBD	Notification of Final Report	MSC website

6.3 Stakeholder Consultation

A total of 47 stakeholder individuals and organisations having relevant interest in the assessment were identified and consulted during this assessment. The interest of others not appearing on this list was solicited through the postings on the MSC website, and by advertising in the Fiskeritidende newspaper and on www.msc-fiskere.dk.

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

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

Stakeholder issues

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

Interview Programme

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

Meetings were held as follows:

Table 6.2: Interview Programme

Jonathan Jacobsen	Client Representative	DFPO
Jens Frich	Skipper	
Verner Moller	Skipper	
Svend Erik Nees	Skipper	
Henning Lilleor	Skipper	
Tonny Nees	Skipper	
Clata Ulrich	Senior research scientist	DTU Aqua, National Institute of Aquatic Resources Section for Public Sector Consultancy
Jørgen Dalskov	Head of Section	DTU Aqua, National Institute of Aquatic Resources Section for Public Sector Consultancy
Ulla Wiborg	Coordinator for certification, traceability etc	Ministry for Food, Agriculture and Fisheries Danish Directorate of Fisheries,
Arne Madsen	Head of Fisheries Inspection	Ministry for Food, Agriculture and Fisheries, Danish Directorate of Fisheries
Mette Blæsbjerg	Programme Officer, Marine and Fisheries	WWF Denmark

6.4 Summary of Information Obtained

DTU Aqua provided information on aspects of Principle 1 and 2 and the Ministry for Food, Agriculture and Fisheries Danish Directorate of Fisheries provided information related to principle 3. WWF submitted information on a number of issues and concern mainly related with Principle 1 and Principle 2.

6.5 Other Certification Evaluations & Harmonisation

At the time of writing, only one MSC assessment has been completed on the northern European hake stock; the Grupo Regal Spain Long-line hake fishery:

- » <http://www.msc.org/track-a-fishery/in-assessment/north-east-atlantic/grupo-regal-spain-hake-longline>

One other MSC assessment targeting this stock is currently underway: the Cornish hake gill net fishery:

<http://www.msc.org/track-a-fishery/in-assessment/north-east-atlantic/cornish-hake-gill-net>

In both cases, the P1 scoring is identical to that for this assessment, being based on ICES' 2013 update on the ICES northern hake stock assessment and aspects of fishery-specific management.

In addition, previously certified fisheries involving DFPO vessels fishing in the North Sea have been used for harmonisation and to provide useful information on Principle 2 issues in particular. The most useful in this regard are

- » DFPO Denmark North Sea & Skagerrak saithe:
<http://www.msc.org/track-a-fishery/certified/north-east-atlantic/dfpo-denmark-saithe>
Certified (for trawl TR1), Danish seine and set nets in February 2011
Compliance with conditions: _ Not applicable
- » DFPO Denmark North Sea plaice:
<http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/Denmark-North-Sea-plaice/>
Certified for trawl (TR1), Danish seine and set nets in March 2011.
Compliance with conditions: _ Not applicable
- » DFPO Denmark North Sea and Skagerrak haddock:
<http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-east-atlantic/dfpo-denmark-haddock>
Certified for TR1, Danish Seine, set nets and longline (TR2 failed) in August 2012.
Compliance with conditions: _ Applicable for all UoCs
- » DFPO Denmark North Sea sole:
http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/dfpo_denmark_north_sea_sole
Certified for Demersal trawl (TR1 and TR2) and set nets in June 2012.
Compliance with conditions: _ Applicable for TR1 and set net UoCs

In order to ensure consistency of outcomes in assessments of overlapping fisheries, the following activities were undertaken:

- » Coordinated certification process
- » Use of common assessment trees
- » Sharing of fishery information

- » Harmonisation of conclusions, scoring and conditions, subsequent to scoring the hake UoCs using the information obtained subsequent to the site visit and updated to ICES' 2013 advice where appropriate.

The following table provides a comparison of individual scores between the client fishery and the other relevant UoCs, namely DFPO haddock and sole in the North Sea and Skagerrak (North Sea plaice and saithe are somewhat out of date, and will have provided a basis for harmonisation for the other DFPO fishery assessments). The main task is to identify those PIs where the current fishery scored outside the main range of these UoCs and where there is a material difference to the outcome between fisheries. This is particularly important where other fisheries have scored below 80 and a condition has been set.

This does not apply to Principle 3, where it is apparent that scoring has been very similar between UoCs (as might be expected). The main potential for harmonisation applies to Principle 2.

Table 7.2: Summary of the P12 and P3 scores for DFPO Denmark North Sea, Skagerrak & Kattegat hake, sole and haddock assessments

Principle 2		TR2 Hake	TR2 Sole	TR2 Had	TR1 Hake	TR1 Sole	TR1 Had	DS Hake	DS Had	SN Hake	SN Sole	SN Had	LL Hake	LL Had
2.1.1	Retained Species	75	75	75	85	75	75	85	75	85	70	75	80	70
2.1.2		75	75	70	75	75	70	85	65	80	75	75	90	80
2.1.3		80	80	80	80	80	80	80	80	90	80	80	80	80
2.2.1	Bycatch	80	80	80	80	80	80	80	80	80	80	80	80	80
2.2.2		80	80	85	95	90	85	95	85	85	80	80	80	80
2.2.3		85	85	85	85	85	85	85	85	75	75	75	75	75
2.3.1	ETP Species	80	80	80	80	80	80	80	80	75	75	75	80	80
2.3.2		75	75	75	75	75	75	75	75	75	75	75	80	80
2.3.3		70	70	70	70	70	70	70	70	70	70	60	70	70
2.4.1	Habitats	75	75	70	75	75	70	80	80	90	90	90	90	90
2.4.2		75	75	75	75	75	75	80	80	85	85	85	95	95
2.4.3		80	80	85	80	80	85	80	85	85	85	85	85	85
2.5.1	Ecosystem	85	95	95	90	95	95	90	95	90	95	95	90	95
2.5.2		85	90	90	90	90	90	90	90	90	90	90	90	90
2.5.3		90	85	85	90	85	85	90	85	90	85	85	90	85

Principle 3 – Management / Governance			Hake	Sole	Haddock
3.1.1	Governance & Policy	Legal & customary framework	85	90	80
3.1.2		Consultation, roles & responsibilities	80	85	80
3.1.3		Long term objectives	100	100	100
3.1.4		Incentives for sustainable fishing	90	90	90
3.2.1	Fishery-specific Management System	Fishery specific objectives	80	80	80
3.2.2		Decision making processes	80	80	80
3.2.3		Compliance & enforcement	95	85	95
3.2.4		Research plan	80	90	80
3.2.5		Management performance evaluation	90	90	85

Taking the range of scores for principle 2 PIs across the various assessments that are applicable to the DFPO hake fishery, there is considerable consistency in the scores for all similar gear types other than for retained species outcome and management in TR1 demersal trawls, Danish seine, set net and longline UoCs, where the hake fishery generally attains a higher mark. In relation to 2.1.1 and 2.1.2, the weaknesses for the haddock and sole fisheries are reflected in the conditions set, which focus on the perception of a lack of progress with rebuilding the cod stock, uncertainty about the anglerfish stock status and with the status of the Nephrops FUs in Sub-area IV. However, Nephrops is not a main retained species in the hake UoCs other than TR2, where this concern is rightly reflected in the scoring. The cod recovery plan is now demonstrably working, and recent biomass estimates for anglerfish in subarea IV have been relatively stable and it seems likely that the stock is within biologically based limits, and there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. As a consequence, neither concern is perceived to be a particular weakness in the current assessment.

6.7 Information Sources Used

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

The primary sources of information on this stock and the fishery are:

- » COUNCIL REGULATION No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. Official Journal of the European Union L 358, 59-80.
- » DTU Aqua. 2011. Landings statistics
- » DTU Aqua. 2010. Discard observer data for demersal trawl and Danish seine from 2000 to 2008.
- » ICES. 2013. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Anglerfish, and Megrin (WGHMM), 10–16 May 2013, ICES Headquarters, Copenhagen
- » ICES, 2013. ICES Advice June 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).
- » Ministry of Food, Agriculture and Fisheries, Denmark (2009). Paving the way for a New Common Fisheries Policy (including a joint statement by Danish, German and UK Fisheries Ministers
- » STECF, 2013. Discard data: stecf.jrc.ec.europa.eu/data-reports

Taken in combination these provide a consolidated view of the stock, the fisheries that exploit the stock, and the science behind advice on the management of the stock. In addition a number of other sources used in this assessment are listed in **Appendix 2**.

7. Scoring

7.1 Scoring Methodology

Process

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

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

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

A fuller description of the MSC Principles and Criteria and a graphical representation of the assessment tree are presented as **Appendix 1** to this report.

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

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

Scoring of the attributes of this fishery against the MSC Principles and Criteria involves the following process:

- » Decision to use the MSC Default Assessment Tree contained within the MSC Fishery Assessment Methodology (FAM v2)
- » Description of the justification as to why a particular score has been given to each sub-criterion
- » Allocation of a score (out of 100) to each Performance Indicator

In order to make the assessment process as clear and transparent as possible, the Scoring Guideposts are presented in the scoring table and describe the level of performance necessary to achieve **100** (represents the level of performance for a Performance Indicator that would be expected in a theoretically ‘perfect’ fishery), **80** (defines the unconditional pass mark for a Performance Indicator for that type of fishery), and **60** (defines the minimum, conditional pass mark for each Performance Indicator for that type of fishery). The Assessment Tree and Scoring Guideposts for the DFPO Denmark North Sea, Skagerrak & Kattegat hake are shown as **Appendix 3** to this report.

Scoring outcomes

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

- » The fishery must obtain a score of 80 or more for each of the MSC’s three Principles, based on the weighted average score for all Criteria and Sub-criteria under each Principle.
- » The fishery must obtain a score of 60 or more for each Performance Indicator.

A score below 80 at the Principle level or 60 for any individual Performance Indicator would represent a level of performance that causes the fishery to automatically fail the assessment.

7.2 Scoring

Following the assessment site visit the assessment team convened a scoring meeting in Copenhagen, Denmark in March 2011.

The output of these meetings is shown in the scoring sheets forming **Appendix 3** to this report. The scores allocated to the assessment tree at Sub-criterion, Criterion and Principle levels are shown schematically in **Table 7.1**. The weighted scores for those Sub-criteria where a score of below 80 has been allocated at Performance Indicator level - and thus triggering the placing of a condition to bring that element up to good industry practice - are indicated in **red**.

Table 7.1: Summary of the scores for DFPO Denmark North Sea, Skagerrak & Kattegat hake

Principle 1 – Stock Status / Harvest Control Rules			All gear types
1.1.1	Outcome (status)	Stock status	90
1.1.2		Reference Points	75
1.1.3		Stock Rebuilding	N/A
1.2.1	Management	Harvest Strategy	90
1.2.2		Harvest control rules & tools	75
1.2.3		Information & monitoring	80
1.2.4		Assessment of stock status	90

Please note: The Longline Unit of Certification has since been removed from the assessment following the granting of a variation by the MSC.

Principle 2 – Wider Ecosystem Impacts			Demersal Trawl (TR2)	Demersal Trawl (TR1)	Danish Seine	Set Nets	Longline
2.1.1	Retained Species	Outcome (status)	75	85	85	85	80
2.1.2		Management	75	75	85	80	90
2.1.3		Information	80	80	80	90	80
2.2.1	Bycatch	Outcome (status)	80	80	80	80	80
2.2.2		Management	80	95	95	85	80
2.2.3		Information	85	85	85	75	75
2.3.1	ETP Species	Outcome (status)	80	80	80	75	80
2.3.2		Management	75	75	75	75	80
2.3.3		Information	70	70	70	70	70
2.4.1	Habitats	Outcome (status)	75	75	80	90	90
2.4.2		Management	75	75	80	85	95
2.4.3		Information	80	80	80	85	85
2.5.1	Ecosystem	Outcome (status)	90	90	90	90	90
2.5.2		Management	90	90	90	90	90
2.5.3		Information	90	90	90	90	90

Principle 3 – Management / Governance			All gear types
3.1.1	Governance & Policy	Legal & customary framework	85
3.1.2		Consultation, roles & responsibilities	80
3.1.3		Long term objectives	100
3.1.4		Incentives for sustainable fishing	90
3.2.1	Fishery-specific Management System	Fishery specific objectives	80
3.2.2		Decision making processes	80
3.2.3		Compliance & enforcement	95
3.2.4		Research plan	80
3.2.5		Management performance evaluation	90

Further details are provided below on those areas where current practices are considered to be below good industry practice. In all cases however, these are not sufficiently below best practice to warrant an automatic failure (i.e. none score less than 60).

In each of these cases a condition is placed upon the fishery as a requirement of certification, further explanation of the attached conditions is provided in **Section 8.3**. And further elaboration on the justification for the scores is provided in the relevant Performance Indicator in the assessment tree in **Appendix 3**. Note that Principle 1 (hake stock status and management) is common to all assessed UoCs, whilst some elements of Principle 2 (ecosystem impacts) are strongly influenced by the type of gear used in each UoC and where it operates, and UoCs are therefore scored separately. Wherever possible, however, we have dealt with UoCs that have similar outcomes in one place, especially where this helps to avoid unnecessary duplication of information and where it is important to highlight the differences between UoCs that lead to different scores. Principle 3 (Governance, policy and fishery-specific management) is largely dealt with on a common basis.

8. Certification Recommendation

8.1 Eligibility Date

The target Eligibility Date for this Certificate is 31 January 2014.

8.2 Overall Scores

The performance of DFPO Denmark North Sea, Skagerrak & Kattegat hake in relation to MSC Principles 1, 2 and 3 is summarised below:

Table 2: Overall scores for DFPO Denmark North Sea, Skagerrak & Kattegat hake

MSC Principle	Fishery Performance				
	Demersal Trawl (TR2)	Demersal Trawl (TR1)	Danish Seine	Set Nets	Longline
Principle 1: Sustainability of Exploited Stock	Overall 83.13				
Principle 2: Maintenance of Ecosystem	Overall: 80.00	Overall: 81.67	Overall: 83.0	Overall: 83.0	Overall: 83.67
Principle 3: Effective Management System	Overall : 86.88				

Please note: The Longline Unit of Certification has since been removed from the assessment following the granting of a variation by the MSC.

The Danish Demersal Trawl (TR1 and TR2), Danish seine, Set-net and Longline UoCs attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any MSC Criteria. It is therefore recommended that the **DFPO Denmark North Sea, Skagerrak & Kattegat hake fishery using TR1 and TR2 demersal trawls, Danish seines and set nets be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries**. In the judgement of the Assessment team, the **DFPO Denmark North Sea, Skagerrak & Kattegat hake fishery using** longlines is not eligible for certification because hake are not recorded in landings from this fishery.

Following this decision by the assessment team, and review by stakeholders and peer-reviewers, the recommendation will be presented to the FCI Certification Sub-Committee that this fishery has passed its assessment and should be certified.

8.3 Conditions

The fishery attained a score of below 80 against a number of Performance Indicators, as indicated in **Table 2**. The assessment team has therefore set a number of conditions for continuing certification that the DNVO, as the client for certification, is required to address. The conditions are applied to improve performance to at least the 80 level within a period set by the certification body but no longer than the term of the certification.

Further elaboration on the justification for the scores is provided in the relevant performance indicator in the assessment tree in **Appendix 3**.

As a standard condition of certification, the client shall develop an '**Action Plan**' for meeting the conditions for continued certification, to be approved by Food Certification International.

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.

In setting conditions for the certification to proceed, it is the intention of the certification body to assist the fishery attain 'best practice' in the areas where scoring has made it necessary for conditions to be applied.

8.3.1 Principle 1 Conditions

Condition 1	Reference points
1.1.2	Reference Points
	Limit and target reference points are appropriate for the stock
SG80 guidepost(s) not met:	The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome.
Score:	75
Rationale	Though limit and target reference points were set in the Hake Recovery Plan, these are now effectively obsolete, given the changed perception of the stock's dynamics shown by ICES' latest assessment. The only reference point currently defined by ICES is F_{MSY} , which appears to have been adopted as the target reference point in management of the northern hake stock (though a new long-term management plan is still under development). Whilst ICES advice is given according to the MSY approach, which implies a fishing mortality at F_{MSY} is expected to maintain the stock at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, there is currently no limit reference point that will ensure that there is no appreciable risk of impairing reproductive capacity nor a biomass target (e.g. MSYBtrigger) that will achieve the same outcome.
Condition	There is a requirement to either estimate limit reference points that will ensure that there is no appreciable risk of impairing reproductive capacity or to establish a biomass target (e.g. MSYBtrigger) that will achieve the same outcome, and to implement a biomass reference point that is consistent with MSY within a management plan.
Annual Milestones	<p>Years 1-2: Support the estimation and implementation of limit and target biomass reference points that are consistent with the MSY approach to fisheries management. Resulting score: 75</p> <p>Year 3: A new long-term management plan shall be implemented that contains a target reference point intended to maintain the stock at levels consistent with BMSY Resulting score: 80</p> <p>Years 4-5: No further action required Resulting score: 80</p>

Condition 1	Reference points
Suggested Action	1st and 2nd year of certification: Work with relevant stakeholders (e.g. ICES and the EC) to estimate and implement limit and target reference points that are consistent with the MSY approach to fisheries management. 3rd Year of Certification: Implement a long-term management plan that contains a target reference point intended to maintaining the stock at levels consistent with BMSY

Condition 2	Harvest Control Rules and Tools
1.2.2	Harvest Control Rules and Tools 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.
Score:	75
Rationale	In 2004, a recovery plan for the Northern hake stock was implemented which included well defined harvest control rules, but these are now effectively obsolete, due to the changing perception of the stock (biomass at an historic high, but uncertainty in the absolute value). A long-term management plan has not yet been implemented. Though advice is given by ICES according to its MSY approach (i.e. exploit at F_{MSY}), it is not apparent how the exploitation rate will be reduced if limit reference points (which are presently not defined) are approached.
Condition	Support work to develop and adopt well-defined harvest control rules that are consistent with the harvest strategy and ensure that exploitation rates is reduced as limit reference points are approached. The HCR should be contained within a long-term management plan.
Annual Milestones	Years 1-2: Support the adoption of well-defined harvest control rules which are consistent with the harvest strategy and ensure that the exploitation rates is reduced as limit reference points are approached. Resulting score: 75 Year 3: A new long-term management plan shall be implemented which contains well defined harvest control rules that are consistent with the harvest strategy and ensure that the exploitation rates is reduced as limit reference points are approached. Resulting score: 80 Years 4-5: No further action required Resulting score: 80
Suggested Action	1st and 2nd Year of certification: Work with relevant stakeholders to support the adoption of well-defined harvest control rules which are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The limitations of the new assessment method to estimate SSB and F should not prevent well-defined control rules to be implemented for the management of this fishery. 3rd year of certification: A long-term management plan should be implemented which contains well defined harvest control rules that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.

8.3.2 Principle 2 Conditions

Condition 3	Condition Details
2.1.1	Relevant UoC's: Demersal trawl (TR2) Summary: Retained Species Outcome status PI
SG80 guidepost(s) not met:	Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.
Rationale	<p>The main retained species in the demersal trawl TR2 UoC in the North Sea are Nephrops, plaice and cod, and in the Skagerrak are Nephrops, haddock, saithe, plaice, witch and cod. Of these, haddock, saithe, plaice, cod, whiting and Nephrops (Skagerrak) are all considered to be highly likely to be within biologically based limits, or are subject to management that has been shown to be effective and should ensure that the hake demersal trawl does not hinder stock recovery and rebuilding. They therefore score at SG80 or higher. North Sea Nephrops (Functional Units 33 – Off Horns Reef) is considered to be of uncertain stock status from latest advice and overall management is not considered precautionary, hence it is considered to score at SG60. Because there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery, minor retained species score 80.</p> <p>Because North Sea and Skagerrak TR2 fisheries are not listed as separate Units of Certification in the assessment, the score at SG60 for North Sea Nephrops main retained species impacts the entire TR2 UoC and results in an overall score <80 as per Table C2 FAMv2.</p>
Score:	Demersal trawl TR2: 75
Annual Milestones	<p>Year 2 by the 2nd Surveillance audit –The client should provide evidence of contacts and discussion with the appropriate fisheries management bodies (Danish Government, Scientific advisors, North Sea RAC, EU Commission) in order to improve assessments of stock status for nephrops (Functional Unit 33 – Off Horns Reef). An alternative milestone would be evidence that efforts are being made to incorporate additional pre-caution into a Functional Unit level Harvest Control Rule for Nephrops if it is likely that improvements to the assessment will be difficult to achieve in a meaningful timeframe. Resulting score: 75</p> <p>Year 4 The client should provide proof that clear steps have been made towards the improvement of stock assessments for Nephrops (FU33). An alternative could be for the client to demonstrate that there has been real and significant progress towards developing and implementing a FU- level HCR. Resulting score: 80</p>
Summary of issues	For Nephrops FU33 ICES states that the state of the stock is unknown. Commercial fishery indices (lpue, landings per unit effort) have been increasing in recent years suggesting that the stock is exploited sustainably. Still it is not highly likely that the stock is within biologically based limits.
Suggested Action	Client is advised to liaise with the appropriate fisheries management and research bodies to discuss the further improvement of assessments for nephrops and the implementation of enhanced management measures where appropriate.

Condition 4	Condition Details
2.1.2	Relevant UoCs: Demersal trawl (TR1 and TR2) Summary: Retained Species Management Strategy PI
SG80 guidepost(s) not met:	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	Anglerfish is a main retained species in the TR1demersal trawl fishery. Management of anglerfish in the North sea and Skagerrak is by TAC only, and there are no other internationally agreed measures in place. Management is not well developed considering anglerfish mature at large size, resulting in a large proportion of the catch consisting of immature fish. This makes the

Condition 4	Condition Details
	<p>stock susceptible to overfishing and additional management measures are considered necessary to ensure sufficient numbers to survive to spawning size.</p> <p>This leads to the conclusion that there is not a partial strategy in place to ensure the fishery does not pose a risk of serious or irreversible harm to the Anglerfish stock. Nephrops FU 33 is a main retained species in the TR2 fishery. Management of nephrops is based on uncertain assessments and management is not sufficiently developed to ensure that effort cannot move freely between FU's in an attempt to catch quota entitlements.</p>
Score:	75 TR2 and TR1
Annual Milestones	<p>Year 2 : by the 2nd Surveillance audit – The client should provide evidence of contacts and discussion with the appropriate fisheries management bodies (Danish Government, Scientific advisors, EU Commission) in order to instigate these bodies to develop a management strategy for Anglerfish in the Skagerrak. Furthermore, arrangements for managing exploitation of the Horns Reef nephrops functional unit should be reviewed and efforts made to develop a clearer more cohesive strategy for management. This should include ensuring assessment techniques are improved</p> <p>Resulting score: 75</p> <p>Year 4 The client should provide proof that clear steps have been made towards the development and implementation of a management strategy for Anglerfish in the Skagerrak along with improved management of FU33 nephrops.</p> <p>Resulting score: 80</p>
Suggested Action	Client is advised to liaise with the appropriate fisheries management authorities to develop and implement a management strategy for Anglerfish in the Skagerrak. Client is advised to liaise with the appropriate fisheries management and research bodies to discuss the further improvement of assessments for nephrops and the implementation of enhanced management measures where appropriate.

Condition 5	Condition Details
2.2.3	<p>Relevant UoCs: Setnet, Long line</p> <p>Summary: Discarded species Information PI</p>
SG80 guidepost(s) not met:	<p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy). (Setnet).</p> <p>Information is adequate to support a partial strategy to manage main bycatch species. (Longline)</p>
Rationale	<p>There is no ongoing monitoring of bycatch in the setnet fishery and observer coverage is at best intermittent. On this basis it is considered unlikely that sufficient data are collected to always identify increased risk within an appropriate timeframe. There is no indication that the fleet are committed to ongoing voluntary recording and reporting of discarding. This is considered less than best practice from a management perspective as the availability of updated information is fundamental to ongoing management of risks. There is no monitoring of discards in the longline fishery. There is no clear sampling or observer strategy in place for the longline fleet which will provide additional qualitative and quantitative data from the fishery in relation to bycatch, in order to support management of impacts. This issue has been scored at SG60 as a consequence of the lack of clear observer data on discarding from the fishery.</p> <p>While it is accepted that this is a selective gear type, precautionary management requires to be informed of all potential sources of unrecorded fishing mortality on affected stocks.</p>
Score:	75
Annual Milestones	<p>Year 1 Resulting score: by the 1st Surveillance audit –Client should provide written evidence of contacts with DTU Aqua showing efforts towards the implementation of discard observer trips in the set net fisheries and the start of discard observer trips in the long line fishery.</p> <p>Resulting score: 75</p> <p>Year 3 By third surveillance audit: provide written evidence that details a strategy for monitoring discarding in both the set net and long line fishery. Clear implementation amongst vessels included in the setnet and longline UoC's of any new measures that give effect to the EU discards ban will take precedence and will be considered as an alternative approach to meeting with the short coming identified in the assessment of setnets under 2.2.3.</p> <p>Resulting score: 80</p>

Suggested Action	Client is advised to liaise with the appropriate fisheries research bodies (DTU Aqua) to continue or start a regular discard monitoring in both the set net and long line fishery.
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Condition 6	Condition Details
2.3.1	Relevant UoC/s: Setnet Summary: ETP Species Outcome status PI
SG80 guidepost(s) not met:	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.
Rationale	There is uncertainty with respect to recent levels of interaction and bycatch of harbour porpoise in setnet fisheries. There is clear potential for the fishery to interact with cetaceans and seals and there is some uncertainty as to whether the total bycatch of harbour porpoise in all fisheries in the North Sea (inc Skagerrak) is within acceptable limits as set by OSPAR (1.7% of best available population estimate).
Score:	75
Annual Milestones	Year 1: Provide proof to the assessment team that the Code of Conduct has been implemented and that vessels record the catches of harbour porpoises. Include within the CoC a requirement for vessels to have a hardcopy of the wheelhouse guide to species identification and handling onboard UoC vessels. Resulting score: 75 Year 4: Provide the team with an analysed data set on the current levels of catches of harbour porpoises in the set net fishery. An independent estimate of the numbers of harbour porpoise caught in the Danish set net fishery that supports the industry findings would clearly reduce the current uncertainty whether the impact of the fishery is within the limits of national and international requirements. Resulting score: 80 Years 5: No further action required
Suggested Action	The DFPO Code of Conduct is in operation since September 2010 requires all vessels to record all catches of ETP species (including marine mammals) in the on-board recording sheet. Data on catches of harbour porpoises in the set net fishery should be collated and reported by the DFPO to the assessment team for each year that the condition applies. Hardcopy of the wheelhouse guide to species identification and handling should be onboard of all vessels fishing with set nets.

Condition 7	Condition Details
2.3.2	TR1, TR2, Setnet, Danish seine Summary: ETP species management strategy PI
SG80 guidepost(s) not met:	There is evidence that the strategy is being implemented successfully.
Rationale	There is uncertainty about the present day bycatch of Harbour porpoise in the setnet fishery. Due to uncertainty with respect to bycatch levels, it is not possible to evaluate the management response or appropriateness of measures. In addition, until such time as landings of Spurdog are completely eliminated or area of capture is provided for landings and skate is reported by species (with no common skate landed) it will not be possible to award the final scoring guide at SG80. In addition, the assessment team did not have direct evidence that a hard copy of the wheelhouse species identification guide has not been produced and circulated to the vessels within the UoC's under assessment.
Score:	75
Annual Milestones	Year 1 (all UoC's) Eliminate all landings of spurdog and skate by the relevant UoC OR document clearly where all landings of spurdog have been captured in the first instance and ensure that none of these emanate from EU waters. Implement full ETP species identification and management guide as well as clear instructions for reporting and logging all ETP catches and live releases. Resulting score: 75

	<p>Year 2 (Demersal trawl, Danish seine, setnets): Provide evidence that spurdog and common skate from EU waters are no longer landed. Resulting score: 80</p> <p>Year 2. (Set Nets). An evaluation of data on bycatch of harbour porpoise should be presented to the team and provide evidence that the strategy to manage the impact of the fishery on ETP species is implemented successfully. Resulting score: 80</p>
Suggested Action	<p>Either eliminate entirely all landings of spurdog and skate or if this is not possible then record and document catches of spurdog and provide to the assessment team summary details accounting for location of capture of all spurdog that are landed by the UoC's. Implement a bycatch sampling observer programme in the fleet along the lines of that indicated for certain fisheries in EU Regulation 812/2004. Finalise hardcopy of species identification guide and distribute to all UoC vessels as part of the CoC.</p>

Condition 8	Condition Details
2.3.3	<p>All UoCs</p> <p>Summary: ETP Species Information PI</p>
SG80 guidepost(s) not met:	<p>Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.</p>
Rationale	<p>Data in relation to ETP interaction falls short of being comprehensive and is not sufficient to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.. The fleet must fully implement appropriate recording of all interactions with ETP as defined in this report and should proactively commence full recording and reporting. Data is essential to effective management response to the issue of ETP interaction. Present data availability does not adequately support management.</p>
Score:	70 (all UoC's)
Annual Milestones	<p>Year 1. Ensure reporting systems account for all captures of ETP species and ETP protocols detail action that should be taken in the event of capture. Data recorded onboard vessels should indicate area of capture, species, gear type, quantity captured and action taken. The requirement to record interactions onboard vessels is ongoing, even where this condition has been closed out. Data to be made available to DTU Aqua for consideration in management initiatives. Independent support of data provided by the industry (from observer trips or CCTV technology) is advised. Have available summary data for all ETP species landings, captures and releases for all certified vessels for at least the first year of certification by first surveillance audit. Resulting score: 80</p>
Suggested Action	<p>Implement fully the terms of the Code of Conduct. Record all captures of ETP species for all certified vessels for all trips and indicate where captures are made (Zone) and what action taken (landed/released/kept on board for later release in EU Zone etc)</p>

Condition 9	Condition Details
2.4.1, 2.4.2	<p>Relevant UoC's: Demersal trawl, TR2, TR1</p> <p>Summary: 2.4.1 Habitat impact outcome indicator PI 2.4.2 Habitat management PI</p>
SG80 guidepost(s) not met:	<p>2.4.1 The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>2.4.2 There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p>
Rationale	<p>Trawling has scope to adversely impact seabed habitats and communities. There is incomplete data with respect to the distribution of sensitive seabed habitats and communities in the area fished, although it is considered unlikely (based on available evidence) that there are extensive areas of either within the areas where the fishery takes place. The fishery is not able to demonstrate clearly which habitat types may be affected by trawling or evaluate the likelihood that trawling may cause damage to certain seabed habitats and communities. It is appropriate that this aspect of the fishery be better informed and managed so that impacts can be evaluated and limited as necessary.</p>
Score:	75 (2.4.1 & 2.4.2)

Condition 9	Condition Details
Annual Milestones	<p>Year 1 By 1st surveillance audit – have developed a spatial plan for the fishery which incorporates new habitat data and integrates habitat considerations into the CoC including measures to reduce unacceptable impacts on sensitive habitats such as gear modifications, avoidance and area closures. This should include special attention to management measures within Natura2000 sites to protect and maintain the biodiversity of these sites. Develop list of sensitive habitats that need to be avoided by the fleet and establish onboard recording system for documenting encounters of trawl gear with any of the sensitive habitats identified in the list. At fleet level (DFPO), develop system for annually summarising and reporting on this data for all certified vessels. Resulting score 2.4.1 & 2.4.2: 75</p> <p>Year 2 – Implement the spatial plan developed in year 1 along with onboard recording of sensitive habitat encounters. A fleet level summary (as described above) should be available at the second surveillance audit. The spatial plan should be updated accordingly. Resulting score 2.4.1 & 2.4.2: 75</p> <p>Year 3 – Continue onboard recording for encounters with sensitive seabed habitats. Update spatial plan with respect to data generated by the fishery. Resulting score 2.4.1 & 2.4.2: 75</p> <p>Year 4 –Demonstrate implementation of a strategy to manage the habitat component of the fishery's footprint and to mitigate adverse and unavoidable impacts (such as by temporal closures of some areas for all fleets). Demonstrate due regard to Natura 2000 sites and capture Natura 2000 management requirements in the fishery spatial plan. Resulting score 2.4.1 & 2.4.2: 80</p>
Suggested Action	<p>Implement onboard recording as part of the CoC. Compile data for all vessels on an annual basis. Proactively seek other available data that can be used to inform the development of a spatial plan. Conduct gap analysis of data to identify geographical areas of uncertainty with respect to seabed habitat types. Consider requirements of improved management including a spatial plan and management strategy with clear objectives and measurable identified.</p>

9 Limit of Identification of Landings

Chain of custody information to be provided later.

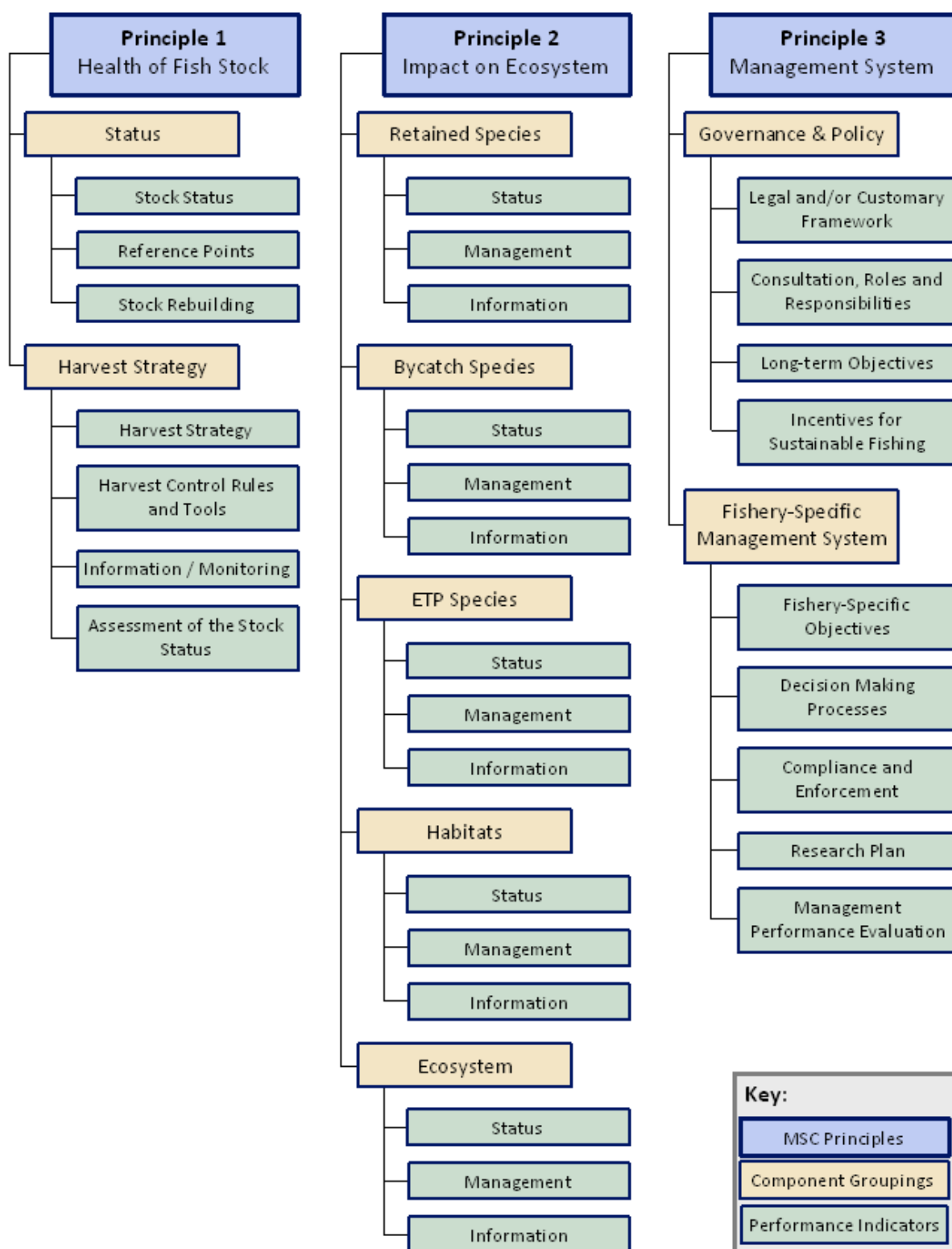
10. Client Agreement to the Conditions

10.1 Client Action Plan

Details as per the Conditions tables in Section 8.3.

Appendix 1 – MSC Principles & Criteria

Figure 1: Diagrammatic representation of MSC Principles & Criteria



Below is a much-simplified summary of the MSC Principles and Criteria, to be used for over-view purposes only. For a fuller description, including scoring guideposts under each Performance Indicator, reference should be made to the full assessment tree, complete with scores and justification, contained

in **Appendix 3** of this report. Alternately a fuller description of the MSC Principles and Criteria can be obtained from the MSC website (www.msc.org).

Principle 1

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

Intent:

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

Status

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

Harvest strategy / management

- » There is a robust and precautionary harvest strategy in place, which is responsive to the state of the stock and is designed to achieve stock management objectives.
- » There are well defined and effective harvest control rules in place that endeavour to maintain stocks at target levels.
- » Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.
- » The stock assessment is appropriate for the stock and for the harvest control rule, takes into account uncertainty, and is evaluating stock status relative to reference points.

Principle 2

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

Intent:

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

Retained species / Bycatch / ETP species

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

Habitat & Ecosystem

- » The fishery does not cause serious or irreversible harm to habitat or ecosystem structure and function, considered on a regional or bioregional basis.
- » There is a strategy and measures in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.

- » The nature, distribution and vulnerability of all main habitat types and ecosystem functions in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

Principle 3

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

Intent:

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

Governance and policy

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

Fishery specific management system

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

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Appendix 3 – Assessment Tree / Scoring sheets

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

Principle 1.

1	A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.			
1.1	Management Outcomes			
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.1	Stock Status The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	It is <u>likely</u> that the stock is above the point where recruitment would be impaired.	It is <u>highly likely</u> that the stock is above the point where recruitment would be impaired. The stock is at or fluctuating around its target reference point.	There is a <u>high degree of certainty</u> that the stock is above the point where recruitment would be impaired. There is a <u>high degree of certainty</u> that the stock has been fluctuating around its target reference point, or has been above its target reference point, <u>over recent years</u> .
Score: 90				
Justification				
<p><i>There is a <u>high degree of certainty</u> that the stock is above the point where recruitment would be impaired.</i></p> <p>Recruitment overfishing occurs when the number and size of the adult population is reduced to a point where the stock does not have the reproductive capacity to replenish itself.</p> <p>(F2001-2008<Fpa).In 2013, the length-based stock assessment carried out by ICES indicated that there is no sign of impaired recruitment (several recent year classes have been above the long-term mean) and that SSB has continued to increase. These trends are consistent with other stock indicators such as: increased landings, increasing LPUEs and decreasing effort of some of the main fleets catching hake. Therefore it was concluded that there is a high degree of certainty that the stock is above the point where recruitment would be impaired.</p> <p><i>The stock is at or fluctuating around its target reference point</i></p> <p>The position of stock status in relation to the target reference point was scored using recent ICES advice (2013), which is consistent with that given in the two previous years. Though no biomass reference point has been set (absolute measures of biomass are still uncertain), ICES considers that the current SSB is above any potential candidate value for MSY Btrigger. ICES has, however, defined F_{MSY} (estimated at 0.24), and the stock is assessed to have been at this level since 2011. The stock is, therefore, at or fluctuating around its target reference point over recent years, but in view of the recent uncertainties in this stock's assessment it cannot be said that there is a high degree of certainty in this respect.</p>				
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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.2	Reference Points Limit and target reference points are appropriate for the stock.	<u>Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.</u>	Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome. For low trophic level species, the target reference point takes into account the ecological role of the stock.	Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary issues. 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.

Score:	75	
Justification		
<p><i>Reference points are appropriate for the stock and can be estimated.</i></p> <p>Reference points set by management (i.e. contained in the Recovery Plan) were estimated using the stock/recruitment relationship with the objective of avoiding recruitment overfishing and maintaining the stock at biomass levels consistent with precautionary limits (i.e. Bpa).</p> <p><i>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.</i></p> <p>The limit reference point is set at Blim, determined as the lowest point at which no effect on recruitment was observed. This provides a low risk of impairing reproductive capacity.</p> <p>However, the reference points contained in the Recovery Plan are effectively obsolete, given the changed perception of the stock's dynamics now that a length-based assessment with a higher growth rate has been accepted by ICES.</p> <p><i>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.</i></p> <p>The only reference point currently defined by ICES is F_{MSY}, estimated at 0.24 (F at 30% SPR: from SSB per recruit analysis, ICES, 2010). This can be regarded as the target reference point, which is employed by ICES to give management advice according to the MSY approach, and implies a fishing mortality at F_{MSY} that is expected to maintain the stock at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome. This follows a special request for advice made by the European Commission regarding the definition of reference points consistent with MSY for its introduction of a new long-term management plan, which is still under development. However, F_{MSY} has apparently been adopted in the management of the northern hake stock.</p> <p>We conclude that none of the 100 guideposts are fully satisfied, and that there is a requirement to either estimate limit reference points that will ensure that there is no appreciable risk of impairing reproductive capacity or establish a biomass target (e.g. MSYBtrigger) that will achieve the same outcome.</p> <p>A condition of certification was raised which focuses in the implementation of a biomass reference point consistent with MSY.</p>		

References

- » ICES, 2010. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Anglerfish and Megrin (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11
- » ICES, 2013. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.3	Stock Rebuilding Where the stock is depleted, there is evidence of stock rebuilding.	Where stocks are depleted rebuilding strategies which have a <u>reasonable expectation</u> of success are in place. Monitoring is in place to determine whether they are effective in rebuilding the stock within a <u>specified</u> timeframe.	Where stocks are depleted rebuilding strategies are in place. There is <u>evidence</u> that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a <u>specified</u> timeframe.	Where stocks are depleted, strategies are <u>demonstrated</u> to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the <u>shortest practicable</u> timeframe.
Score:		N/A		
Justification				
Despite there being no formal replacement of the hake stock recovery plan with a long-term management plan, the stock has clearly fully recovered from the depleted state observed in the 1990s, and this SI is not applicable.				
References				

1.2	Harvest Strategy (management)			
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.1	Harvest Strategy There is a robust and precautionary harvest strategy in place	<p>The harvest strategy is <u>expected</u> to achieve stock management objectives reflected in the target and limit reference points.</p> <p>The harvest strategy is <u>likely</u> to work based on prior experience or plausible argument.</p> <p><u>Monitoring</u> is in place that is expected to determine whether the harvest strategy is working.</p>	<p>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work together</u> towards achieving management objectives reflected in the target and limit reference points.</p> <p>The harvest strategy may not have been fully tested but monitoring is in place and <u>evidence</u> exists that it is achieving its objectives.</p>	<p>The harvest strategy is responsive to the state of the stock and is <u>designed</u> to achieve stock management objectives reflected in the target and limit reference points.</p> <p>The performance of the harvest strategy has been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.</p> <p>The harvest strategy is <u>periodically reviewed and improved</u> as necessary.</p>
Score: 90				
Justification				
<p><i>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work together</u> towards achieving management objectives reflected in the target and limit reference points.</i></p> <p>Element of the harvest strategy are working together to achieve management objectives. ICES assess the stock in annually and provide advice for conservation and management. Following ICES advice on stock status an annual TAC is set by the European commission. The annual TAC is set following a set of control rules contained in the recovery plan (EC Reg. No. 811/2004, Annex 9.4.10). However, this plan uses target values based on precautionary reference points that are no longer appropriate.</p> <p>MSYtrigger has not been identified for this stock, but the ICES MSY approach has been applied using fishing mortality at F_{MSY} (= 0.24) to advise on landings for the coming year.</p> <p><i>The performance of the harvest strategy has been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.</i></p> <p>The harvest strategy employed in the recovery plan initiated in 2004 has been tested through successive stock assessments, and has been shown to have achieved its objectives. The stock has reached the highest recorded biomass and fishing mortality has been at F_{MSY} since 2011. A long term management plan is under development following the successful recovery of the stock.</p> <p><i>The harvest strategy is <u>periodically reviewed and improved</u> as necessary</i></p> <p>Evidence of this is the introduction of the recovery plan in 2004 and the current development of the long term management plan.</p>				
References				
<p>» ICES, 2009. ICES Advice 2009. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).</p> <p>» ICES, 2013. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).</p>				

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.2	Harvest control rules and tools There are well defined and effective harvest control rules in place	<u>Generally understood</u> harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. There is <u>some evidence</u> that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	<u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The <u>selection</u> of the harvest control rules takes into account the <u>main</u> uncertainties. <u>Available evidence indicates</u> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	<u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The <u>design</u> of the harvest control rules take into account a <u>wide</u> range of uncertainties. <u>Evidence clearly shows</u> that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
Score: 75				
Justification				
<p><u>Generally understood</u> harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.</p> <p>In 2004, a recovery management plan for the Northern hake stock was implemented (EC Reg. No. 811/2004). The aim of the plan is to increase the SSB to above 140,000 t by limiting fishing mortality to 0.25 and by allowing a maximum change in TAC between years of 15%. Although the harvest control rules of the recovery plan could be considered as well defined, they are now effectively obsolete, due to the changing perception of the stock (biomass at an historic high, but uncertainty in the absolute value), and a long-term management plan has not yet been implemented. The harvest control rules for the hake fishery are currently ill-defined, though advice is given by ICES according to its MSY approach (i.e. exploit at F_{MSY}). Nevertheless, it is not apparent how the exploitation rate will be reduced if limit reference points are approached, and issue 1 of SG 80 was not met and a condition for certification applies.</p> <p><u>The selection of the harvest control rules takes into account the main uncertainties.</u></p> <p>Because the harvest control rule is aimed at achieving MSY, it effectively takes account of the main uncertainties by ensuring that the stock is maintained at a level that ensures a low risk of recruitment overfishing.</p> <p><u>Available evidence indicates</u> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p> <p>Since the recovery plan was initiated fishing mortality has decreased to F_{MSY} and the stock biomass has increased continuously: the management objective has been met. The TAC and other technical measure management tools have been effective in achieving SSB and F targets.</p>				
References				
<p>» ICES, 2009. ICES Advice 2009. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).</p> <p>» ICES, 2010a. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Anglerfish and Megrim (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11</p> <p>» ICES, 2010b. ICES Advice 2010. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).</p>				

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.3	Information monitoring Relevant information is collected to support the harvest strategy	<u>Some</u> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy. Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	<u>Sufficient</u> relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy. Stock abundance and fishery removals are <u>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</u> , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule. There is good information on all other fishery removals from the stock.	<u>A comprehensive range</u> of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available. <u>All information</u> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent <u>uncertainties</u> in the information [data] and the robustness of assessment and management to this uncertainty.
Score: 80				
Justification				
<u>Sufficient</u> relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy Relevant information related to stock structure and stock productivity is available. The distribution of the northern hake stock is well understood, though the separation of the northern and southern hake stock is based on management rather than biological considerations. Tagging of European hake recently opened a better understanding of the species biology and population dynamics, in particular providing evidence of faster growth and shorter life span than estimated through the use of ageing techniques (i.e. otolith reading techniques). This has resulted in a shift of assessment methodology (see PI 1.2.4). The fleet composition targeting northern hake is well understood. The fleet is classified into different categories depending on the gear used and geographic area where the fleet operates for stock assessment purposes. <u>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.</u> Stock abundance and fishery removal are regularly monitored, though the reduction in the availability of log-book information in recent years for the French fleet added to the inadequacy of the way catch data are collected for the longline fleet means that LPUE cannot be used at present as abundance indices. Consequently, assessment of the stock relies heavily on surveys abundance indices, which do not contain information on large fish sizes and lead to some uncertainty associated with estimates of SSB and fishing mortality. Nevertheless, ICES is now much more confident in its length-based assessment of this stock, which has shown consistent trajectories in SSB and F (and estimates of recruitment strength), and is a robust basis for management advice. <i>There is good information on all other fishery removals from the stock.</i> There is good information on all fishery removals. Landings of hake are recorded through the use of the European logbook and discard data (i.e. data on fish not landed) is collected under the requirements of the EU Data Collection regulation. Since year 2008 discards estimates from several fleets were used in the assessment.				

SG100 is not satisfied, in part because there appears to have been an environmental influence on the stock distribution and productivity of northern hake, the biological basis for which is not well understood.

References

- » ICES, 2013. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).
- » ICES, 2013. Report of the Working Group on the Assessment of the southern Shelf Stocks of Hake, Anglerfish and Megrim (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.4	Assessment of stock status There is an adequate assessment of the stock status	The assessment estimates stock status relative to reference points. The major sources of uncertainty are identified.	The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points. The assessment takes uncertainty into account. The stock assessment is subject to peer review.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery. The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way. The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. The assessment has been internally and externally peer reviewed.
Score: 90				
Justification				
<p><i>The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points. It takes into account the major features relevant to the biology of the species and the nature of the fishery.</i></p> <p>Since the adoption of a length-based model (Stock Synthesis SS3) for assessment of the northern hake stock (by the ICES WGHMM), uncertainties associated with the previously used age-based Extended Survivors Analysis (XSA) method have now been largely overcome. The current stock assessment is used to estimate fishing mortality and spawning stock size for determination of stock status in relation to F_{MSY} and is applied by ICES in giving advice in relation to the harvest control rule. Using a length-based model that employs fishery landings data and survey abundance indices (especially for juveniles) takes into account the major features relevant to the biology of the species (growth, life-stage distribution) and the nature of the fishery.</p> <p><i>The assessment takes uncertainty into account</i></p> <p>Uncertainties related to biological parameters (i.e. growth) have been discussed extensively and are behind the shift of assessment methodology. Though there is poor quality of some fishery data used for the assessment of the stock (i.e. unreliability of LPUE as an abundance index, in part due to discarding), estimates of SSB and F (strong increase in SSB and strong decrease in F) are used in the scientific advice, which follows ICES' MSY approach and is less dependent on absolute biomass reference levels.</p> <p><i>The assessment has been internally and externally peer reviewed.</i></p> <p>The stock assessment is subject to peer review through the working group process. A review is undertaken by the Scientific, Technical and Economic Committee for Fisheries (STECF).</p>				
References				
<p>» ICES, 2013. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Anglerfish and Megrin (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11</p> <p>» ICES, 2013. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).</p>				

PRINCIPLE 2

Demersal Trawl TR2 (70mm ≤ mesh size ≤ 100mm)

Demersal Trawl TR2 (70mm ≤ mesh size ≤ 100mm)				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.1	Status The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.	Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.	Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
Score: 75				

Summary: Demersal trawl (< 100 mm mesh size)

The main retained species (>5% of total catch) in the demersal trawl TR2 UoC using mesh size smaller than 100mm in the North Sea are Nephrops, plaice and cod, and in the Skagerrak are Nephrops, haddock, saithe, plaice, witch and cod, whilst anglerfish, dab, ling, pollack, turbot and lemon sole are minor retained species that comprise more than a negligible proportion (>1%) of the catch.

For the main retained species, haddock, saithe, plaice, cod, whiting and Nephrops (Skagerrak) are all considered to be highly likely to be within biologically based limits based on the most recently available advice for those stocks or are subject to management that has been shown to be effective and should ensure that the hake demersal trawl does not hinder stock recovery and rebuilding. They therefore score at SG80 or higher. North Sea Nephrops (Functional Units 33 – Off Horns Reef) is considered to be of uncertain stock status from latest advice and overall management is not considered precautionary, hence it is considered to score at SG60. Because there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery, minor retained species score 80.

According to Table C2, a score of 75 is awarded, since all scoring elements meet SG 60 and most achieve a higher performance at or exceeding SG80, and only Nephrops fails SG80 and require intervention action.

North Sea and Skagerrak TR2 fisheries are not listed as separate Units of Certification in the assessment, therefore the score at SG60 for North Sea nephrops main retained species impacts the entire TR2 UoC and results in an overall score <80 as per Table C2 FAMv2.

Justification: Demersal trawl < 100 mm mesh size (TR2)

The Danish demersal trawl fleet lands hake as part of a mixed fishery targeting roundfish, flatfish and *Nephrops* in the North Sea, on the southern edge of the Norwegian Trench and in the Skagerrak in the EU and Norwegian zones. Data on retained species have been presented separately for the North Sea and the Skagerrak which, for some species contain different management “stocks”. Because the species composition of catches taken by demersal trawl fisheries with mesh sizes smaller than 100 mm (TR2) are likely to differ from those for the trawl fisheries using mesh sizes larger or equal than 100 mm (TR1), these have been treated as separate UoCs in this assessment.

Estimates of the quantities of retained species landed in conjunction with hake in Danish otter trawl fisheries using cod-end meshes < 100 mm (TR2) in the North Sea and Skagerrak (Table 4.1) are based on catch composition

data provided by the client based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for trips that actually caught hake and which are therefore representative of the UoC under consideration. These data have been used to identify main (i.e. >5% of total catch) and other retained species for each of the UoCs, split by North Sea and Skagerrak as appropriate. The data base showed a number of species the landings of which individually amounted to less than one t for the entire UoC, or comprise a negligible proportion (<1%) of the catch, and these have not been considered since they represent a negligible proportion of the total international catch.

The main retained species (>5% of total catch) in the demersal trawl TR2 UoC using mesh size smaller than 100mm in the North Sea are Nephrops, plaice and cod, and in the Skagerrak are Nephrops, haddock, saithe, plaice, witch and cod, whilst anglerfish, dab, ling, pollack, turbot and lemon sole are minor retained species.

Main retained species

North Sea

Nephrops: It is assumed that catches in 2012 from the North Sea came from functional unit 33 ('Off Horns Reef') (TR2 is not allowed in the zone). Catches of Nephrops have declined in recent years and the status of the stock is unknown: but there has been a long-term increase in lpu and the stock is likely to be within biologically-based limits. Current management of Nephrops in Sub-area IV (both in terms of TACs and effort) does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in functional units. In the current situation, vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way and this has historically resulted in inappropriate harvest rates from some areas. It is not considered that Nephrops retained catches in TR2 gears meet with SG80 and that the functional unit (32) affected by the TR2 fishery is at best only likely to be within biologically based limits (SG60). Score 60.

Plaice: In 2013, ICES reports that a combined assessment of plaice in the Skagerrak and the North Sea shows a consistent increase in the total SSB, which is well above MSY Btrigger for the North Sea stock. In recent years, fishing mortality has been estimated below F_{MSY} . There is a high degree of certainty that NS plaice are within biologically based limits (SG100). Plaice in the North Sea meets all of the retained species outcome status SG60, SG80 and SG 100 issues and therefore scores 100.

Cod: Latest advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak) estimates that SSB has continued to recover since the mid-2000s, although it remains at a low level. The stock is considered to be just at Blim, but remains below MSY and management plan trigger points. Fishing mortality continues to be above target F_{MSY} , but below the target F_{MP} . This meets with SG80, but the situation with respect to cod will need to be monitored closely in future surveillance audits in order to ensure that the fishery does not impact on recovery and rebuilding. Score 80.

Skagerrak

Nephrops: Within the Skagerrak, ICES' advice in 2013 for Nephrops (functional units 4 and 5) is that estimates of absolute abundance for 2011 and 2012 from an underwater TV (UWTV) survey for the whole (Skagerrak) showed a 30% decrease, though the landings per unit effort suggest an increase in biomass over the full time-series. Though no estimates of stock status are available, ICES considered suggest that the stock is exploited sustainably, and it is likely that the Nephrops in FU 4 and 5 are within biologically based limits (and $<F_{MSY}$). However, no reference points are defined for either stock and no specific management objectives are known to ICES. It is considered that catches of nephrops from functional units 4 and 5 meet with SG80. Score 80.

Haddock: haddock in Sub-area IV (North Sea) and Division IIIa West (Skagerrak) is assessed using an age-based XSA by ICES, which provides advice set against MSY and precautionary approach-based biological reference points (ICES, 2013). Though recent recruitment has been moderate, and the stock has been declining steadily since 2003, it is currently well within biologically-based limits and being harvested sustainably. The stock is above management plan and MSY trigger points and is considered to have full reproductive capacity. An EU-Norway management plan has been implemented and ICES has endorsed it as being consistent with the MSY and precautionary approaches. For the haddock stock there is a high degree of certainty that the stock is within biologically based limits and therefore meets all of the SG60, SG80 and the first of the SG 100 issues and therefore scores 90.

Saithe: ICES' 2013 advice for saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) shows that SSB increased above Bpa in 1997, but has declined steadily since 2005. The latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around F_{MSY} since 1997. Recruitment has been below average since 2006 and shows a declining trend in recent years. Despite there being an increased risk, the saithe remains above Blim. Score 80.

Plaice: plaice in the Skagerrak is considered to have two components: Eastern and Western, the latter being mixed with the North Sea stock. Advice for Division IIIa plaice is now split into plaice in subdivision 20 and plaice in Kattegat, Belts, and Sound (subdivisions 21–23). No analytical assessment is available for the Skagerrak alone. The West Skagerrak survey biomass index suggests that, in recent years, the Western component is higher than

the historical average. Overall F is uncertain, though effort has been reduced sharply in recent years. This is sufficient evidence to consider that the Skagerrak retained catch of plaice from subdivision 20 meets with SG80. Score 80.

Witch: ICES Advice (2013) for witch in Subarea IV and Divisions IIIa and VIId is that both landings and survey abundance indices show a declining trend since the peak observed in 2000 and an increase in recent years (survey abundance indices were >20% higher in 2011–2013, than the average for 2006–2010). Though exploratory estimates suggest that fishing mortality is above any potential F_{MSY} proxies, there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. An EU TAC is set for EU waters of area IIa and IV together with lemon sole. Score 80

Cod, see North Sea.

Minor retained species

Anglerfish: The anglerfish stock in Division IIIa and Subareas IV and VI is subject to a trends-based assessment using abundance indices from directed anglerfish surveys. Trends in both abundance and biomass appeared to peak about 2007 – 2008 and have since been declining. Because of uncertainties concerning catch-at-age data for anglerfish as well as limited knowledge about population dynamics, a more robust estimate is not possible. However, based on current biomass estimates for anglerfish in subarea IV which have been relatively stable over the past 5 years and apparent stability in catches in recent years, it seems likely that the stock is within biologically based limits.

Dab: According to IBTS Q1 data for the North Sea, the abundance of dab has increased substantially in the long-term (at least to 2005), in part related to opportunistic adaptations to trawl fisheries and the restrictions on effort associated with the plaice and sole management plan. While the status of the stock is unknown, dab is managed by TACs in the North Sea. This, together with discard management strategy, provides sufficient mitigation to ensure that the hake demersal trawl fishery does not hinder the recovery and rebuilding of dab in the North Sea. Common dab in the North Sea meets all of the bycatch species outcome status SG60 and SG80 issues.

Ling: There is no quantitative stock assessment for ling. In the North Sea its stock status is inferred from trends in catch per unit of effort in the Norwegian long-line fisheries. There has been a sustained positive trend since 2000, but the status of the stock is unknown in the absence of biological reference points.

Pollack: There is no analytical assessment nor any biological reference points for pollack, and the state of the stock is unknown. However, total international landings from the North Sea have been relatively stable at c. 1500 – 2000 t over the past 20 years.

Turbot: There are no analytical assessments for turbot, and ICES consider that the available information is inadequate to evaluate stock trends (WGNEW 2010). Nevertheless, the three relevant survey series indicate increasing abundance of most age-groups of turbot between 2002 and 2010 and the stock is likely to be above within biologically-based limits. The relatively low importance attached to turbot in North Sea fisheries is reflected in the lack of precautionary reference points, specific management plan or an EC minimum landing size, though precautionary TACs have been defined for turbot and brill (combined) in EC-fisheries in Division IIa and Sub-area IV.

Lemon sole: Survey cpue indices suggest that the abundance of lemon sole in the North Sea increased fourfold between 1991 to 2005, though this rise in abundance was not reflected in landings (due, possibly, to reductions in effort under cod, sole and plaice management plans). ICES notes that there are no management measures in place for lemon sole, and insufficient data to assess stock status.

Though the status of all minor retained species is poorly known, there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. Overall score for minor retained species is therefore 80

In the scoring table, the team has scored the outcome status for the main retained species individually and then an overall score was assigned by applying the scoring rule described in p18 from FAM v2 (Table C2).

References

- » ICES Advice for Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice 2013, Book 6. 6.4.7
- » ICES Advice for Saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) ICES Advice 2013, Book 6. 6.4.21
- » ICES Advice for Plaice in Subdivision 20 (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.17

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|---|--|
| » | ICES Advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.3 |
| » | ICES Advice for Nephrops in Division IIIa. ICES Advice 2013. Book 6 Section 6.4.14 |
| » | ICES Advice for Nephrops in Subarea IV (North Sea). ICES Advice 2013. Book 6 Section 6.4.15b |
| » | |

Demersal Trawl TR1 (mesh size \geq 100mm)

Demersal Trawl TR1 (mesh size \geq 100 mm)				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.1	Status The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.	Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.	Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
Score: 85				

Summary: Demersal trawl (> 100 mm mesh size)

The main retained species (>5% of total catch) in the TR1 UoC using mesh size larger than 100mm and catching hake in the North Sea are anglerfish, haddock, saithe, plaice and cod, and in the Skagerrak are haddock, saithe, plaice and cod, whilst wolffish, whiting, nephrops, dab, ling, pollack, turbot, lemon sole and witch are minor retained species that comprise no more than a negligible proportion (>1%) of the catch. Golden redfish is considered to be a vulnerable retained species.

For the main retained species, haddock, saithe, plaice, cod, whiting and Nephrops (Skagerrak) are all considered to be highly likely to be within biologically based limits based on the most recently available advice for those stocks, whilst anglerfish are considered to be of uncertain stock status but are subject to management measures (cod recovery plan, sole and plaice management plan) that are expected to result in the hake demersal trawl fishery not hindering stock recovery and rebuilding. Because overall management is expected to result in the fishery not causing minor retained species to be outside biologically based limits or hindering recovery, they are scored at SG80.

According to FAM v2 (Table C2) , a score of 85 is awarded, since all scoring elements meet SG 80 and a few achieve a higher performance, but most do not meet SG100.

North Sea and Skagerrak TR1 fisheries are not listed as separate Units of Certification in the assessment, therefore the score arrived at applies to both North Sea and Skagerrak TR1 fisheries.

Justification: Demersal trawl > 100 mm mesh size (TR1)

Estimates of the quantities of retained species landed in conjunction with hake in Danish otter trawl fisheries using cod-end mesh sizes >100 mm in the North Sea and Skagerrak (Table 4.2) are based on catch composition data provided by the client based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for trips that actually caught hake and which are therefore representative of the UoC under consideration. These data have been used to identify main (i.e. >5% of total catch) and other retained species for each of the UoCs, split by North Sea and Skagerrak as appropriate. The data base showed a number of species the landings of which individually amounted to less than one t for the entire UoC, or that comprise a negligible proportion (<1%) of the catch, and these have not been considered since they represent a negligible proportion of the total international catch.

The main retained species (>5% of total catch) in the TR1 UoC (using mesh size larger than 100mm) and catching hake in the North Sea are anglerfish, haddock, saithe, plaice and cod, and in the Skagerrak are haddock, saithe, plaice and cod, whilst wolffish, whiting, nephrops, dab, ling, pollack, turbot, lemon sole and witch are minor

retained species that comprise more than a negligible proportion (>1%) of the catch. Golden redfish is considered to be a vulnerable retained species.

Main retained species

North Sea

Anglerfish: The anglerfish stock in Subareas IV and VI and Division IIIa is subject to a trends-based assessment using abundance indices from directed anglerfish surveys. Trends in both abundance and biomass appeared to peak about 2007 – 2008 and have since been declining. Because of uncertainties concerning catch-at-age data for anglerfish as well as limited knowledge about population dynamics, a more robust estimate is not possible. Accordingly, it is not possible to say that the anglerfish stock is highly likely to be within biologically based limits (SG80). However based on current biomass estimates for anglerfish in subarea IV which have been relatively stable over the past 5 years and apparent stability in catches in recent years, it seems likely that the stock is within biologically based limits and there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.). Anglerfish in the North Sea and Skagerrak therefore scores 80.

Haddock: haddock in Sub-area IV (North Sea) and Division. IIIa West (Skagerrak) is assessed using an age-based XSA by ICES, which provides advice set against MSY and precautionary approach-based biological reference points (ICES, 2013). Though recent recruitment has been moderate, and the stock has been declining steadily since 2003, it is currently well within biologically-based limits and being harvested sustainably. The stock is above management plan and MSY trigger points and is considered to have full reproductive capacity. An EU–Norway management plan has been implemented and ICES has endorsed it as being consistent with the MSY and precautionary approaches. For the haddock stock there is a high degree of certainty that the stock is within biologically based limits and therefore meets all of the SG60, SG80 and the first of the SG 100 issues and therefore scores 90.

Saithe: ICES' 2013 advice for saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) shows that SSB increased above Bpa in 1997, but has declined steadily since 2005. The latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around FMSY since 1997. Recruitment has been below average since 2006 and shows a declining trend in recent years. Despite there being an increased risk, the saithe remains above Blim. Score 80.

Plaice: In 2013, ICES reports that a combined assessment of plaice in the Skagerrak and the North Sea shows a consistent increase in the total SSB, which is well above MSY Btrigger for the North Sea stock. In recent years, fishing mortality has been estimated below FMSY. There is a high degree of certainty that NS plaice are within biologically based limits (Sla at SG100). Target reference points are defined and the stock has consistently been above target reference points in recent years (Sib at SG100). Plaice in the North Sea meets all of the retained species outcome status SG60, SG80 and SG 100 issues and therefore scores 100.

Cod: Latest advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak) estimates that SSB has continued to recover since the mid-2000s, although it remains at a low level. The stock is considered to be just at Blim, but remains below MSY and management plan trigger points. Fishing mortality continues to be above target FMSY but below the target F(MP). This meets with SG80 the situation with respect to cod retained catch will need to be monitored closely in future surveillance audits in order to ensure that the fishery does not impact on recovery and rebuilding. Score 80.

Golden redfish *S. marinus*: ICES' assessment of golden redfish in Subareas I and II shows that SSB has been decreasing since the 1990s and is currently at the lowest level in the time-series, whilst fishing mortality is considered to be well above a sustainable level for a redfish stock. As a consequence, ICES' advice for golden redfish in Subareas I and II in 2013–2016 is that there should continue to be no fishing on this stock (advice for 2008 – 2012 no directed fishery and low by catch limits), and that any by catch of *S. marinus* should be kept as low as possible. The current annual catch of the client fleet is c. 2.6 t, which is 0.04% of the international total landings of 6,000 t as estimated by ICES, and is therefore not important in management terms. Score 80.

Skagerrak

Haddock, saithe and cod, see North Sea

Plaice: plaice in the Skagerrak is considered to have two components: Eastern and Western, the latter being mixed with the North Sea stock. Advice for Division IIIa plaice is now split into plaice in subdivision 20 and plaice in Kattegat, Belts, and Sound (subdivisions 21–23). No analytical assessment is available for the Skagerrak alone. The West Skagerrak survey biomass index suggests that, in recent years, the Western component is higher than the historical average. Overall F is uncertain, though effort has been reduced sharply in recent years. This is

sufficient evidence to consider that the Skagerrak retained catch of plaice from subdivision 20 meets with SG80. Score 80.

Minor retained species

Wolffish are not identified to species in the landings, but it is possible that the species caught in the Danish UoCs is Atlantic wolffish *A. lupus*. All wolffish species are slow growing and long-lived fish that spawn late in life (5-8 yrs), the male guards large clusters of eggs deposited on the bottom until they hatch, which makes them vulnerable to bottom trawling. Because wolffish has limited commercial importance - it makes up only a small proportion of trawl catches - there has been no assessment of its stock dynamics, and ICES do not provide advice for this species. Anecdotal information from stakeholders suggests that it is most likely not overfished.

Whiting: There is no robust ICES assessment of the whiting stock in Subarea IV (North Sea) and Division VIId (Eastern Channel), for which reference levels are undefined and only indicative trends in SSB and F are available. These show that SSB in 2009 was around half the level observed in 1990 and remains below average, whilst fishing mortality reduced considerably since 1990 and has been stable over the last 4 years. Abundance estimated from the IBTS Q1 and Q3 surveys indicate that whiting appears to be declining in the northern North Sea. The status of the whiting stock in the Skagerrak is unknown due to inadequate information being available. However, the stock is managed by a TAC which is shown to be effective and should ensure that the hake demersal trawl does not hinder the recovery and rebuilding of whiting in the Skagerrak. Whiting in the Skagerrak meets all of the bycatch species outcome status SG60 and SG80 issues

Nephrops North Sea nephrops retained catch is assumed to emanate from functional units 33 ('Off Horns Reef') and 32 ('Norwegian Deep'). Catches of nephrops in FU's 32 and 33 have declined in recent years, and the status of individual "stocks" is unknown: at best they are likely to be within biologically-based limits. Current management of Nephrops in Sub-area IV (both in terms of TACs and effort) does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in functional units. In the current situation, vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way and this has historically resulted in inappropriate harvest rates from some areas. Despite this, catches of nephrops in TR1 gears from the North Sea are a very small component of the overall catch and are a minor retained species, therefore meeting with SG80.

Nephrops: Within the Skagerrak, ICES' advice in 2013 for Nephrops (functional units 4 and 5) is that estimates of absolute abundance for 2011 and 2012 from an underwater TV (UWTV) survey for the whole (Skagerrak) showed a 30% decrease, though the landings per unit effort suggest an increase in biomass over the full time-series. Though no estimates of stock status are available, ICES considered suggest that the stock is exploited sustainably, and it is likely that the Nephrops in FU 4 and 5 are within biologically based limits. However, no reference points are defined for either stock, and no specific management objectives are known to ICES. It is considered that catches of nephrops from functional units 4 and 5 meet with SG80.

Ling: There is no quantitative stock assessment for ling. In the North Sea its stock status is inferred from trends in catch per unit of effort in the Norwegian long-line fisheries. There has been a sustained positive trend since 2000, but the status of the stock is unknown in the absence of biological reference points. Ling is considered to score at SG80 on account of the insignificant level of catch in the TR1 fishery (minor retained).

Pollack: There is no analytical assessment nor any biological reference points for pollack, and the state of the stock is unknown. However, total international landings from the North Sea have been relatively stable at c. 1500 – 2000 t over the past 20 years.

Lemon sole: Survey cpue indices suggest that the abundance of lemon sole in the North Sea increased fourfold between 1991 to 2005, though this rise in abundance was not reflected in landings (due, possibly, to reductions in effort under cod, sole and plaice management plans). ICES notes that there are no management measures in place for lemon sole, and insufficient data to assess stock status.

Witch: ICES Advice (2013) for witch in Subarea IV and Divisions IIIa and VIId is that both landings and survey abundance indices show a declining trend since the peak observed in 2000 and an increase in recent years (survey abundance indices were >20% higher in 2011–2013, than the average for 2006–2010). However, exploratory estimates suggest that fishing mortality is above any potential FMSY proxies. No specific management objectives are known to ICES. An EU TAC is set for EU waters of area IIa and IV together with lemon sole.

Dab: According to IBTS Q1 data for the North Sea, the abundance of dab has increased substantially in the long-term (at least to 2005), in part related to opportunistic adaptations to trawl fisheries and the restrictions on effort associated with the plaice and sole management plan. While the status of the stock is unknown, dab is managed by TACs in the North Sea. This, together with discard management strategy, provides sufficient mitigation to ensure that the hake demersal trawl fishery does not hinder the recovery and rebuilding of dab in the North Sea. Common dab in the North Sea meets all of the bycatch species outcome status SG60 and SG80 issues.

Turbot: There are no analytical assessments for turbot, and ICES consider that the available information is inadequate to evaluate stock trends (WGNEW 2010). Nevertheless, the three relevant survey series indicate increasing abundance of most age-groups of turbot between 2002 and 2010 and the stock is likely to be above within biologically-based limits. The relatively low importance attached to turbot in North Sea fisheries is reflected in the lack of precautionary reference points, specific management plan or an EC minimum landing size, though precautionary TACs have been defined for turbot and brill (combined) in EC-fisheries in Division IIa and Sub-area IV.

Though the status of all minor retained species is poorly known, there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. Overall score for minor species is therefore 80.

In the scoring table the team has scored the outcome status for the main retained species individually and then an overall score was assigned by applying the scoring rule described in FAM v2 (Table C2).

References

- » DTU Aqua. 2012. Landings statistics
- » ICES Advice for Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice 2013, Book 6. 6.4.7
- » ICES Advice for Saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) ICES Advice 2013, Book 6. 6.4.21
- » ICES Advice for Plaice in Subdivision 20 (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.17
- » ICES Advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.3
- » ICES Advice for Nephrops in Division IIIa. ICES Advice 2013. Book 6 Section 6.4.14
- » ICES Advice for Nephrops in Subarea IV (North Sea). ICES Advice 2013. Book 6 Section 6.4.15b
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Danish Seine

Danish seine				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.1	Status The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.	Main retained species are likely to be within biologically based limits or if 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 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.	Main retained species are highly likely to be within biologically based limits, or if 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.	There is a high degree of certainty that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
Score: 85				
Summary: Danish seine The main retained species (>5% of total catch) in the Danish seine UoC in the North Sea are plaice and cod, and in the Skagerrak haddock, plaice, witch and cod, whilst dab, saithe and lemon sole are minor retained species that comprise more than a negligible proportion (>1%) of the catch. For the main retained species, plaice, cod and haddock are all considered to be highly likely to be within biologically based limits based on the most recently available advice for those stocks or are subject to management that has been shown to be effective and should ensure that the hake demersal trawl does not hinder stock recovery and rebuilding. They therefore score at SG80 or higher. Witch landings and survey abundance indices show a declining trend since 2000 and an increase in recent years, but because there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery, all retained species score at least 80. According to Table C2, a score of 85 is awarded, since cod, Skagerrak plaice and witch all achieve SG80 scores, while North Sea plaice and haddock achieve a higher performance at SG100.				
Justification: Danish seine The client vessels deploying Danish seine and landing hake are recorded to operate predominately in the Skagerrak. Estimates of the quantities of retained species landed in conjunction with hake in Danish seine fisheries the North Sea and Skagerrak (Table 4.3) are based on catch composition data provided by the client based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for trips that actually caught hake and which are therefore representative of the UoC under consideration. These data have been used to identify main (i.e. >5% of total catch) and other retained species for each of the UoCs, split by North Sea and Skagerrak as appropriate. The data base showed a number of species the landings of which individually amounted to less than one t for the entire UoC, or that comprise a negligible proportion (<1%) of the catch, and these have not been considered since they represent a negligible proportion of the total international catch. The main retained species (>5% of total catch) in the Danish seine UoC in the North Sea are plaice and cod, and in the Skagerrak haddock, plaice, witch and cod, whilst dab, saithe and lemon sole are minor retained species that comprise more than a negligible proportion (>1%) of the catch.				

Main retained species

North Sea

Plaice: In 2013, ICES reports that a combined assessment of plaice in the Skagerrak and the North Sea shows a consistent increase in the total SSB, which is well above MSY Btrigger for the North Sea stock. In recent years, fishing mortality has been estimated below F_{MSY} . There is a high degree of certainty that NS plaice are within biologically based limits (Sla at SG100). Target reference points are defined and the stock has consistently been above target reference points in recent years (Slb at SG100). Plaice in the North Sea meets all of the retained species outcome status SG60, SG80 and SG 100 issues and therefore scores 100.

Cod: Latest advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak) estimates that SSB has continued to recover since the mid-2000s, although it remains at a low level. The stock is considered to be just at Blim, but remains below MSY and management plan trigger points. Fishing mortality continues to be above target F_{MSY} but below the target $F(MP)$. This meets with SG80 the situation with respect to cod retained catch will need to be monitored closely in future surveillance audits in order to ensure that the fishery does not impact on recovery and rebuilding. Score 80.

Skagerrak

Haddock: haddock in Sub-area IV (North Sea) and Division. IIIa West (Skagerrak) is assessed using an age-based XSA by ICES, which provides advice set against MSY and precautionary approach-based biological reference points (ICES, 2013). Though recent recruitment has been moderate, and the stock has been declining steadily since 2003, it is currently well within biologically-based limits and being harvested sustainably. The stock is above management plan and MSY trigger points and is considered to have full reproductive capacity. An EU–Norway management plan has been implemented and ICES has endorsed it as being consistent with the MSY and precautionary approaches. For the haddock stock there is a high degree of certainty that the stock is within biologically based limits and therefore meets all of the SG60, SG80 and the first of the SG 100 issues and therefore scores 90.

Cod, see North Sea

Plaice: plaice in the Skagerrak is considered to have two components: Eastern and Western, the latter being mixed with the North Sea stock. Advice for Division IIIa plaice is now split into plaice in subdivision 20 and plaice in Kattegat, Belts, and Sound (subdivisions 21–23). No analytical assessment is available for the Skagerrak alone. The West Skagerrak survey biomass index suggests that, in recent years, the Western component is higher than the historical average. Overall F is uncertain, though effort has been reduced sharply in recent years. This is sufficient evidence to consider that the Skagerrak retained catch of plaice from subdivision 20 meets with SG80. Score 80.

Witch: ICES Advice (2013) for witch in Subarea IV and Divisions IIIa and VIId is that both landings and survey abundance indices show a declining trend since the peak observed in 2000 and an increase in recent years (survey abundance indices were >20% higher in 2011–2013, than the average for 2006–2010). Though exploratory estimates suggest that fishing mortality is above any potential F_{MSY} proxies, there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. An EU TAC is set for EU waters of area IIa and IV together with lemon sole. Score 80

Minor retained species.

Dab: According to IBTS Q1 data for the North Sea, the abundance of dab has increased substantially in the long-term (at least to 2005), in part related to opportunistic adaptations to trawl fisheries and the restrictions on effort associated with the plaice and sole management plan. While the status of the stock is unknown, dab is managed by TACs in the North Sea. This, together with discard management strategy, provides sufficient mitigation to ensure that the hake demersal trawl fishery does not hinder the recovery and rebuilding of dab in the North Sea. Common dab in the North Sea meets all of the bycatch species outcome status SG60 and SG80 issues

Saithe: ICES' 2013 advice for saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) shows that SSB increased above Bpa in 1997, but has declined steadily since 2005. The latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around F_{MSY} since 1997. Recruitment has been below average since 2006 and shows a declining trend in recent years. Despite there being an increased risk, the saithe remains above Blim.

Lemon sole: Survey cpue indices suggest that the abundance of lemon sole in the North Sea increased fourfold between 1991 to 2005, though this rise in abundance was not reflected in landings (due, possibly, to reductions in effort under cod, sole and plaice management plans). ICES notes that there are no management measures in place for lemon sole, and insufficient data to assess stock status.

Though the status of all minor retained species is poorly known, there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. Overall score 80.

In the scoring table the team has scored the outcome status for the main retained species individually and then an overall score was assigned by applying the scoring rule described in p18 from FAM v2 (Table C2).

References

- » DTU Aqua. 2012. Landings statistics
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Set Nets (Gill Net and Trammel Net)

Set nets				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.1	Status The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.	Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.	Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
Score: 85				
Summary: Set nets The Danish set-net fisheries primarily targets cod and plaice in the North Sea and the Skagerrak, and sole in the southern North Sea. However, when only landings that include hake are considered, it is apparent that only cod is a main retained species in the North Sea and Skagerrak. Anglerfish, ling, turbot and plaice are considered to be minor retained species (Table 4.4). The main retained species (cod) is considered to be likely to be within biologically based limits based on the most recently available advice. Recent management that has been shown to be effective if slower than had been predicted at ensuring recovery, but is considered likely to ensure that the hake demersal trawl fishery does not hinder stock recovery and rebuilding, therefore meeting with SG80. Anglerfish, turbot, and pollack are considered to be of uncertain stock status from latest advice though overall management is expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery, hence they are scored at SG80. According to Table C2, a <u>score of 85 is awarded</u> . Cod, Skagerrak plaice, Pollack and saithe scoring elements all achieve SG80 while the haddock scoring elements meet SG 90.				
Justification: Set nets The Danish set-net fisheries primarily targets cod and plaice in the North Sea and the Skagerrak, and sole in the southern North Sea. Estimates of the quantities of retained species landed in conjunction with hake in Danish set net fisheries the North Sea and Skagerrak (Table 4.4) are based on catch composition data provided by the client based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for trips that actually caught hake and are therefore representative of the UoC under consideration. These data have been used to identify main (i.e. >5% of total catch) and other retained species for each of the UoCs, split by North Sea and Skagerrak as appropriate. The data base showed a number of species the landings of which individually amounted to less than one t for the entire UoC, and these have not been considered since they represent a negligible proportion of the total international catch. The Danish set-net fisheries primarily targets cod and plaice in the North Sea and the Skagerrak, and sole in the southern North Sea. However, when only landings that include hake are considered, it is apparent that only cod is a main retained species in the North Sea, whilst haddock, pollack, saithe, plaice and cod are main retained species in the Skagerrak. Anglerfish, ling, turbot and plaice are considered to be minor retained species (Table 4.4).				

Main retained species

North Sea

Cod: Latest advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak) estimates that SSB has continued to recover since the mid-2000s, although it remains at a low level. The stock is considered to be just at Blim, but remains below MSY and management plan trigger points. Fishing mortality continues to be above target FMSY but below the target F(MP). This meets with SG80 the situation with respect to cod retained catch will need to be monitored closely in future surveillance audits in order to ensure that the fishery does not impact on recovery and rebuilding. Score 80.

Skagerrak

Haddock: haddock in Sub-area IV (North Sea) and Division IIIa West (Skagerrak) is assessed using an age-based XSA by ICES, which provides advice set against MSY and precautionary approach-based biological reference points (ICES, 2013). Though recent recruitment has been moderate, and the stock has been declining steadily since 2003, it is currently well within biologically-based limits and being harvested sustainably. The stock is above management plan and MSY trigger points and is considered to have full reproductive capacity. An EU–Norway management plan has been implemented and ICES has endorsed it as being consistent with the MSY and precautionary approaches. For the haddock stock there is a high degree of certainty that the stock is within biologically based limits and therefore meets all of the SG60, SG80 and the first of the SG 100 issues and therefore scores 90.

Cod, see North Sea

Plaice: plaice in the Skagerrak is considered to have two components: Eastern and Western, the latter being mixed with the North Sea stock. Advice for Division IIIa plaice is now split into plaice in subdivision 20 and plaice in Kattegat, Belts, and Sound (subdivisions 21–23). No analytical assessment is available for the Skagerrak alone. The West Skagerrak survey biomass index suggests that, in recent years, the Western component is higher than the historical average. Overall F is uncertain, though effort has been reduced sharply in recent years. This is sufficient evidence to consider that the Skagerrak retained catch of plaice from subdivision 20 meets with SG80. Score 80.

Pollack: There is no analytical assessment nor any biological reference points for pollack, and the state of the stock is unknown. However, total international landings from the North Sea have been relatively stable at c. 1500 – 2000 t over the past 20 year and the stock is likely to be within biologically-based limits and there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.

Score 80

Saithe: ICES' 2013 advice for saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) shows that SSB increased above Bpa in 1997, but has declined steadily since 2005. The latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around FMSY since 1997. Recruitment has been below average since 2006 and shows a declining trend in recent years. Despite there being an increased risk, the saithe remains above Blim. Score 80.

Minor retained species

Anglerfish: The anglerfish stock in Subareas IV and VI and Division IIIa is subject to a trends-based assessment using abundance indices from directed anglerfish surveys. Trends in both abundance and biomass appeared to peak about 2007 – 2008 and have since been declining. Because of uncertainties concerning catch-at-age data for anglerfish as well as limited knowledge about population dynamics, a more robust estimate is not possible. Accordingly, it is not possible to say that the anglerfish stock is highly likely to be within biologically based limits (SG80). However based on current biomass estimates for anglerfish in subarea IV which have been relatively stable over the past 5 years and apparent stability in catches in recent years, it seems likely that the stock is within biologically based limits (SG60)..

Turbot: There are no analytical assessments for turbot, and ICES consider that the available information is inadequate to evaluate stock trends (WGNEW 2010). Nevertheless, the three relevant survey series indicate increasing abundance of most age-groups of turbot between 2002 and 2010 and the stock is likely to be above within biologically-based limits. The relatively low importance attached to turbot in North Sea fisheries is reflected in the lack of precautionary reference points, specific management plan or an EC minimum landing size, though precautionary TACs have been defined for turbot and brill (combined) in EC-fisheries in Division IIa and Sub-area IV.

Plaice: In 2013, ICES reports that a combined assessment of plaice in the Skagerrak and the North Sea shows a consistent increase in the total SSB, which is well above MSY Btrigger for the North Sea stock. In recent years, fishing mortality has been estimated below FMSY. There is a high degree of certainty that NS plaice are within biologically based limits (SG100). Plaice in the North Sea meets all of the retained species outcome status SG60, SG80 and SG 100 issues and therefore scores 100.

Ling: There is no quantitative stock assessment for ling. In the North Sea its stock status is inferred from trends in catch per unit of effort in the Norwegian long-line fisheries. There has been a sustained positive trend since 2000, but the status of the stock is unknown in the absence of biological reference points. Ling is considered to score at SG80 on account of the insignificant level of catch in the senet fishery (minor retained).

Though the status of most minor retained species is poorly known, there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. All therefore score 80.

In the scoring table the team has scored the outcome status for the main retained species individually and then an overall score was assigned by applying the scoring rule described in p18 from FAM v2 (Table C2).

References

- » DTU Aqua. 2012. Landings statistics
- » ICES Advice for Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice 2013, Book 6. 6.4.7
- » ICES Advice for Saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) ICES Advice 2013, Book 6. 6.4.21
- » ICES Advice for Plaice in Subdivision 20 (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.17
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Long-line Please note: The Longline Unit of Certification has since been removed from the assessment following the granting of a variation by the MSC.

Long line				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.1	Status The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.	Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.	Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
		Score: 80		
Summary: Long line Cod and haddock are the main retained species in this fishery, whilst ling and pollack are minor retained species. The main retained species, cod and haddock are considered to be highly likely to be within biologically based limits based on the most recently available advice for those stocks or are subject to management that has been shown to be affective and should ensure that the hake demersal trawl does not hinder stock recovery and rebuilding. They therefore score at SG80 or higher. The minor retained species, ling and pollack, are considered to be of uncertain stock status from latest advice though overall management is expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery., hence they are scored at SG60. According to Table C2, a <u>score of 80</u> is awarded, since all scoring elements for main retained species meet SG 80, while haddock retained catch also meets with one scoring issue at SG100.				
Justification: Long line The Danish long line fishery had not been practiced for some years, but some vessels have recently been equipped for this fishery and have resumed longlining. These vessels are < 15 m and do not complete EU log books. However, data on landings of three long-line vessels have been provided to the team by the client; for one vessel covered the whole year 2010; and for two other vessels for part of 2010 (Table 4.5). Cod and haddock are the main retained species in this fishery, whilst ling and pollack are minor retained species. Landings data do not show any hake catch in the longline fishery. Main retained species Cod: Latest advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak) estimates that SSB has continued to recover since the mid-2000s, although it remains at a low level. The stock is considered to be just at Blim, but remains below MSY and management plan trigger points. Fishing mortality continues to be above target FMSY but below the target F(MP). This meets with SG80 the situation with respect to cod retained catch will need to be monitored closely in future surveillance audits in order to ensure that the fishery does not impact on recovery and rebuilding. <u>Score 80.</u> Haddock: haddock in Sub-area IV (North Sea) and Division. IIIa West (Skagerrak) is assessed using an age-based XSA by ICES, which provides advice set against MSY and precautionary approach-based biological reference points (ICES, 2013). Though recent recruitment has been moderate, and the stock has been declining steadily since 2003, it is currently well within biologically-based limits and being harvested sustainably. The stock is above management plan and MSY trigger points and is considered to have full reproductive capacity. An EU–Norway management plan has been implemented and ICES has endorsed it as being consistent with the MSY and precautionary approaches.				

For the haddock stock there is a high degree of certainty that the stock is within biologically based limits and therefore meets all of the SG60, SG80 and the first of the SG 100 issues and therefore scores 90.

Minor retained species

Ling: There is no quantitative stock assessment for ling. In the North Sea its stock status is inferred from trends in catch per unit of effort in the Norwegian long-line fisheries. There has been a sustained positive trend since 2000, but the status of the stock is unknown in the absence of biological reference points.

Pollack: There is no analytical assessment nor any biological reference points for pollack, and the state of the stock is unknown. However, total international landings from the North Sea have been relatively stable at c. 1500 – 2000 t over the past 20 years.

Though the status of all minor retained species is poorly known, there are measures or practices in place (cod recovery plan, sole and plaice management plan) that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery. All therefore score 80.

In the scoring table, the team has scored the outcome status for the main retained species individually and then an overall score was assigned by applying the scoring rule described in p18 from FAM v2 (Table C2).

References

- » DTU Aqua. 2012. Landings statistics
- » ICES Advice for Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice 2013, Book 6. 6.4.7
- » ICES Advice for Cod in Subarea IV (North Sea) and Divisions VIIId (Eastern Channel) and IIIa West (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.3

Demersal trawl (TR2 and TR1), Danish seine, Set nets and Long line				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.2	Management strategy There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.	There are <u>measures</u> in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a <u>partial strategy</u> in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a <u>strategy</u> in place for managing retained species.
		The measures are considered <u>likely</u> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or species involved. There is <u>some evidence</u> that the partial strategy is being <u>implemented successfully</u> .	The strategy is mainly based on information directly about the fishery and/or species involved, and <u>testing</u> supports <u>high confidence</u> that the strategy will work. There is <u>clear evidence</u> that the strategy is being <u>implemented successfully</u> , and intended changes are occurring. There is some evidence that the strategy is <u>achieving its overall objective</u> .
Score: TR1 gear 75 TR2 gear 75 Danish seine 85 Setnet 80 Longline 90				
Summary: There are both partial strategies and more comprehensive strategies in place for managing main retained species landed in association with the demersal otter trawl fisheries (TR1 gear). For most species there is evidence that these strategies are achieving their overall objectives. The score is arrived at by scoring each main retained species individually and then applying the rule from p18 from FAM v2. There are both partial strategies and more comprehensive strategies in place for managing main retained species landed in association with the Danish seine fisheries. The score is arrived at by scoring each main retained species individually and then applying the rule from p18 from FAM v2. There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or species involved. There is <u>some evidence</u> that the partial strategy is being <u>implemented successfully</u> .				
Justification: There is a strategy in place for managing retained species in all five UoCs in the form of species-specific measures, area management and technical measures, including the following: » TACs and Quotas				

- » Minimum landing sizes and minimum marketing standards
- » Closed areas
- » Technical gear restrictions
- » Cod recovery plan and days at sea
- » Ban on high grading
- » Ban on discards in Norwegian zone

All retained species with the exception of wolffish are subject to Total Allowable Catch (TAC) limits, which are set annually by the EU Council for specific species/stocks within the Exclusive Economic Zones (EEZs) of the EU Member States. TACs are then divided, based on a fixed scale (relative stability), between the Member States into national quotas. Landings statistics are recorded from daily logbook and sales notes data, which allows trends and a total volume of species landed to be monitored and provides evidence that the overall objective of TACs and quotas are being achieved.

Minimum landing sizes and minimum marketing standards

The EU minimum landing sizes are set out in Annex XII of Regulation No 850/98. The EU regulation states that undersized animals are not to be retained on board, transshipped, landed, transported, stored, sold, displayed or offered for sale and must be returned immediately to the sea. Most of the retained species mentioned above have a minimum landing size.

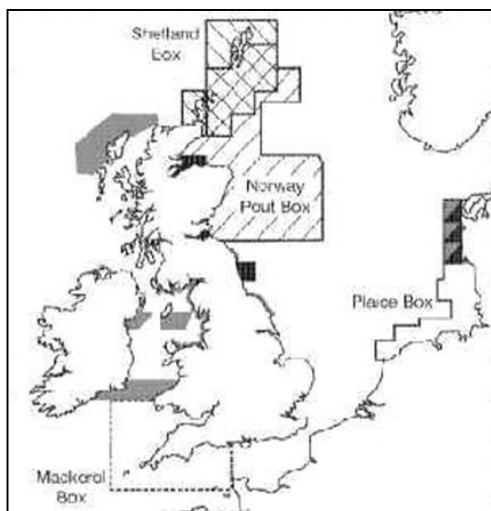
The Council Regulation (EC) No 2406/96 sets out common marketing standards for certain fishery products primarily relating to improving product quality. Along with a number of freshness criteria there is a requirement that fishery products be graded on the basis of size according to weight and/or size. It is under this regulation that a minimum marketing size is established which indirectly acts as a minimum landing size for certain species.

Sales notes record size categories of fish and shellfish landed and act as evidence that this management measure is achieving its overall objective.

Closed areas

There are a number of fixed closed areas or boxes within the North Sea as shown in Figure 1. These have various restrictions relating to number and nationality of vessels that can fish in the area (Shetland box), power of vessels allowed to operate in the area (plaice box), gear restrictions such as mesh size (Norway pout box) and seasonal restrictions (Patch bank, Norway). While these restrictions are applicable to Danish vessels, they do not occur across the grounds targeted by the Danish hake fisheries. Nevertheless, these measures limit effort and therefore directly or indirectly manage the retained species stocks.

Figure 1. Closed areas in the North Sea



A Real Time Closure (RTC) system is in place for the North Sea and Skagerrak as part of an agreement between the EC and Norway. This is designed to protect juvenile cod, haddock, whiting and saithe by closing an area for 21 days when a 200kg catch sample contains more than 15% of juveniles of these species. This closure also indirectly protects all species within the area for the 21 day period.

Technical gear restrictions

Otter trawl, seine and set net fisheries within the EU zone operate with different mesh sizes dependent on target species and area.

When the target species is Nephrops, a minimum mesh size of 80 mm is allowed (a certain percentage of the catch has to consist of the target species). It is known that the bycatch of juvenile cod can be high in the fishery for Nephrops in the Skagerrak (ICES, 2011) and these cod are discarded. However, technical regulations introduced for the Skagerrak from 2013 are explicitly designed to reduce the roundfish discards of TR2 (Nephrops directed) fisheries to TR1 level.

Fisheries such as the demersal trawl fisheries for plaice are allowed to use a 100 mm mesh size, but mainly use a mesh size of 110mm, while in the Norwegian zone the minimum mesh size is 120mm. Consultation indicates that when moving from Norwegian to EU zone vessels operate the same gear therefore using 120mm across both areas.

Additional management measures are in place for cod selectivity which came into force during 2009 (EU-Norway Agreement, 2008) including:

- » To ensure that cod quota is taken up steadily throughout the year quota uptake is monitored to quarterly targets. Technical changes are required where volumes of cod reach more than 10% above the target.
- » Technical / selectivity measures, such as eliminator trawls (including BACOMA and T90), are also required if 90% of the cod quota has been taken at any time before 15th November ensuring sufficient escapement so that the remaining 10% is not likely to be exceeded.

Cod recovery plan and Days at Sea

At the December 2002 Fisheries Council Member States agreed to reduce their fishing effort on cod by 65% and to implement a Cod Recovery Plan with limits on days at sea (for vessels over 10m) to achieve this. In December 2008 the European Commission and Norway agreed on a new cod management plan implementing a new system of linked effort management with a new target fishing mortality. ICES evaluated this management plan in March 2009 and concluded that it is consistent with the precautionary approach if advice therefore allows catches of cod to be taken under this new management agreement.

Other measures

Other measures that are known to have a positive impact on retained species include a ban on high grading for Danish vessels and a ban on discarding in the Norwegian zone. These are discussed further in 2.2.2 Bycatch Management.

The management regime outlined above is common to all five UoCs (obviously, long lines are not subject to mesh size controls), so the team's scoring assessment is based on the evaluation of the efficacy of these management strategies as they apply to the main and minor retained species, which differ between UoCs. The score for each UoC is arrived at by scoring each main retained species individually and then applying the rule from p18 from FAM v2.

TR1 UoC. The main retained species (>5% of total catch) in the TR1 UoC using mesh size larger than 100mm and catching hake in the North Sea are anglerfish, haddock, saithe, plaice and cod, and in the Skagerrak are haddock, saithe, plaice and cod, whilst wolffish, whiting, nephrops, dab, ling, pollack, turbot, lemon sole and witch are minor retained species that comprise no more than a negligible proportion (>1%) of the catch. Golden redfish is considered to be a vulnerable retained species. Management of anglerfish in the North sea and Skagerrak is by TAC and there are no other internationally agreed management measures in place. Management is not well developed considering anglerfish mature at large size, resulting in a large proportion of the catch consisting of immature fish. This makes the stock susceptible to overfishing and additional management measures are considered necessary to ensure sufficient numbers to survive to spawning size. Anglerfish management meets with SG60 (measures in place). NS plaice, haddock and saithe are management by a long term management plans that are considered to be precautionary and ensure that these stocks remain within biologically based limits and to ensure that the fisheries do not hinder recovery in the event of rebuilding. Management strategies for haddock, saithe, and plaice are therefore considered to constitute a strategy and therefore meet with SG100. Cod management is covered by the cod recovery plan and is considered to meet with the definition of a partial strategy, the main shortcoming in cod management being the difficulty with eliminating bycatch of undersize cod in demersal fisheries. The partial strategy meets with SG80. There is an objective basis for confidence that the strategies and partial strategies will work based on the application of scientific rationale that underpins management and recovery plans as well as observed changes in the performance and operation of EU fishing fleets that share entitlements to fish for these stocks as a result of management measures. The current status of haddock, plaice and saithe stocks along with evidence of continued rebuilding of cod biomass provide clear evidence of management success. Management of minor retained species is in many cases less well developed (ling, nephrops, whiting, turbot, lemon sole, witch) and meets with SG80. Application of scoring by elements rules (Table C2, FAM v2) indicates a score of <80 on account of anglerfish management shortcomings. Overall TR1 score is 75.

TR2 gear UoC. The main retained species (>5% of total catch) in the TR1 UoC using mesh sizes less than 100mm and catching hake in the North Sea are nephrops, haddock, saithe, plaice, cod and witch. NS plaice, haddock and saithe are management by a long term management plans that are considered to be precautionary and ensure that these stocks remain within biologically based limits and to ensure that the fisheries do not hinder recovery in the event of rebuilding. Management

strategies for haddock, saithe, and plaice are therefore considered to constitute a strategy and therefore meet with SG100. Cod management is covered by the cod recovery plan and is considered to meet with the definition of a partial strategy, the main shortcoming in cod management being the difficulty with eliminating bycatch of undersize cod in demersal fisheries. The partial strategy meets with SG80. For nephrops, it is assumed that catches in 2012 from the North Sea came from functional unit 33 ('Off Horns Reef'). Overall catches of Nephrops have declined in recent years and the status of the stock is unknown: but there has been a long-term increase in lpue and the stock is likely to be within biologically-based limits. Current management of nephrops in Sub-area IV (both in terms of TACs and effort) does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in functional units. In the current situation, vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way and this has historically resulted in inappropriate harvest rates from some areas. There is an objective basis for confidence that the strategies and partial strategies will work based on the application of scientific rationale that underpins management and recovery plans as well as observed changes in the performance and operation of EU fishing fleets that share entitlements to fish for these stocks as a result of management measures. The current status of haddock, plaice and saithe stocks along with evidence of continued rebuilding of cod biomass provide clear evidence of management success. However, it is not considered that Nephrops retained catches in TR2 gears meet with SG80 and that the functional unit (32) affected by the TR2 fishery is at best only likely to be within biologically based limits (SG60). Score 60. Application of scoring by elements rules (Table C2, FAM v2) indicates a score of <80 on account of NS nephrops management shortcomings. Overall TR2 score is 75.

Danish seine UoC. The main retained species (>5% of total catch) in the Danish seine UoC in the North Sea are plaice and cod, and in the Skagerrak haddock, plaice, witch and cod. Dab, saithe and lemon sole are minor retained species that comprise more than a negligible proportion (>1%) of the catch. NS plaice and haddock are managed under long term management plans that are considered to be precautionary and which are highly likely to ensure that these stocks remain within biologically based limits and ensure that the fisheries do not hinder recovery in the event of rebuilding. Management strategies for haddock, saithe, and plaice are therefore considered to constitute a strategy and therefore meet with SG100. Cod management is covered by the cod recovery plan and is considered to meet with the definition of a partial strategy, the main shortcoming in cod management being the difficulty with eliminating bycatch of undersize cod in demersal fisheries. The partial strategy meets with SG80. No specific management objectives exist in relation to witch. An EU TAC is set for EU waters of area IIa and IV together with lemon sole witch. There is a minimum landing size which is enforced but the strategies together are considered sufficient to meet with a partial strategy and therefore score SG80. There is an objective basis for confidence that the strategies and partial strategies will work based on the application of scientific rationale that underpins management and recovery plans as well as observed changes in the performance and operation of EU fishing fleets that share entitlements to fish for these stocks as a result of management measures. The current status of haddock, plaice and saithe stocks along with evidence of continued rebuilding of cod biomass provide clear evidence of management success. Retained catch of minor species are also considered to meet with SG80. Application of scoring by elements rules (Table C2, FAM v2) indicates a score of 85, given that management for all elements meets with SG80 (cod, Skagerrak plaice and witch) while SG100 is achieved for a few (haddock, plaice). Overall Danish seine score is 85.

Set net UoC. The Danish set-net fisheries primarily targets cod and plaice in the North Sea and the Skagerrak, and sole in the southern North Sea. When only setnet landings that include hake are considered, it is apparent that only cod is a main retained species in the North Sea and Skagerrak. Anglerfish, ling, turbot and plaice are considered to be minor retained species. Cod management is covered by the cod recovery plan and is considered to meet with the definition of a partial strategy, the main shortcoming in cod management being the difficulty with eliminating bycatch of undersize cod in demersal fisheries with mobile gears. The partial strategy meets with SG80. There is an objective basis for confidence that the partial strategy will work based on the application of scientific rationale that underpins management and the cod recovery plans as well as observed changes in the performance and operation of EU fishing fleets that share entitlements to fish for these stocks as a result of management measures. Continued recovery and building of cod biomass provides clear evidence of recent management success. Management of minor retained species is in many cases less well developed however meets with SG80. Application of scoring by elements rules (Table C2, FAM v2) indicates a score of 80 on account of cod management. Overall setnet score is 80.

Longline UoC. Cod and haddock are the main retained species in this fishery, whilst ling and pollack are minor retained species. Cod management is covered by the cod recovery plan and is considered to meet with the definition of a partial strategy, the main shortcoming in cod management being the difficulty with eliminating bycatch of undersize cod in demersal fisheries with mobile gears. The partial strategy meets with SG80. Haddock is managed under a long term management plan that is considered to be precautionary and which is highly likely to ensure that the stock remains within biologically based limits and ensure that the fisheries do not hinder recovery in the event of rebuilding. Management measures for haddock are considered to constitute a strategy and therefore meet with SG100. There is an objective basis for confidence that the cod and haddock management strategies will work based on the application of scientific rationale that underpins the haddock management plan and the cod recovery plan, as well as observed changes in the performance and operation of EU fishing fleets that share entitlements to fish for these stocks as a result of implementation of enhanced stock management. Application of scoring by elements rules (Table C2, FAM v2) indicates a score of 80 for cod management and 90 for haddock. Overall longline score is 90.

References

- » COUNCIL REGULATION (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy
- » Council Regulation (EC) No 2406/96 of 26 November 1996 laying down common marketing standards for certain fishery products
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- » Spencer J. And Westberg A.K. 2009 Agreed Record of Conclusions of Consultations between the European Community and Norway to establish a System of Real Time Closures in the North Sea and Skagerrak

Demersal Trawl (TR1 and TR2)				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.3	Information monitoring Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.	<u>Qualitative information</u> is available on the amount of main retained species taken by the fishery.	<u>Qualitative information</u> 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.
		Information is <u>adequate to qualitatively</u> assess outcome status with respect to biologically based limits. Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.	Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits. Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species. Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Information is <u>sufficient</u> to quantitatively estimate outcome status with a <u>high degree of certainty</u> . Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
Score: 80				
Summary: Demersal trawl TR1 and TR2 Data has been provided to allow determination of volumes of all retained species landed in conjunction with the Danish demersal trawl fishery landing hake. This information is both accurate and verifiable and provides data to inform the status of these species and to inform the associated TACs and quotas. Information is recorded within a 5% tolerance on onboard logbooks for all retained species. Information is collected centrally by the Ministry and is adequate to determine the risk posed by the fishery as well as the effectiveness of the partial strategy to manage retained species. Information on retained species catch can be verified from source log sheets and can be cross referenced with landings inspection reports and at sea inspection reports. It is concluded that sufficient data continue to be collected to detect any increase in risk level. Information is assessed as being sufficient to estimate outcome status with respect to biologically based limits and adequate to support partial strategies to manage main retained species. All of the SG80 issues are therefore met and a score of 80 awarded.				
Justification: Demersal trawl (TR1 and TR21) The Danish demersal trawl fleet lands hake as part of a mixed fishery targeting roundfish, flatfish and <i>Nephrops</i> in the North Sea, on the southern edge of the Norwegian Trench and in the Skagerrak in the EU and Norwegian zones. Because the species composition of catches taken by demersal trawl fisheries with mesh sizes smaller than 100 mm (TR2) are likely to differ from those for the trawl fisheries using mesh sizes larger or equal than 100 mm (TR1), these have been treated as separate UoCs in this assessment, but the information base is the same. Data on retained species were available separately for the North Sea and the Skagerrak which, for some species, contain different management “stocks”. Estimates of the quantities of retained species landed in conjunction with hake in Danish otter trawl fisheries using cod-end meshes < 100 mm (TR2) and > 100 mm (TR1) in the North Sea and Skagerrak are based on catch composition data provided by the client based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for trips that actually caught hake and which are				

therefore representative of the UoC under consideration. These data have been used to identify main retained (i.e. >5% of total catch) and other retained species for each of the UoCs, split by North Sea and Skagerrak as appropriate to check if there are any substantive differences by fishing area. It was assessed that this information is sufficient to estimate outcome status of the retained species.

Information available for the retained species associated with the demersal trawl fisheries meet all of the SG80 issues therefore scores 80.

References

- » DTU Aqua. 2012. Landings statistics
- » ICES 2013, Book 6 and Book 9 Fisheries advice

Danish seine				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.3	Information monitoring / Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.	<u>Qualitative information</u> is available on the amount of main retained species taken by the fishery. Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits. Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.	<u>Qualitative information</u> and some quantitative information are available on the amount of main retained species taken by the fishery. Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits. Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species. Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations. Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of certainty</u> . Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
Score: 80				
Justification: Danish seine				
<p>The client vessels deploying Danish seine and landing hake are recorded to operate predominately in the Skagerrak. Estimates of the quantities of retained species landed in conjunction with hake in Danish seine fisheries the North Sea and Skagerrak are based on catch composition data (in kg) provided by the client based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for trips that actually caught hake and which are therefore representative of the UoC under consideration. These data have been used to identify main (i.e. >5% of total catch) and other retained species for the Danish seine UoC, split by North Sea and Skagerrak as appropriate to check if there are any substantive differences by fishing area.</p> <p>Data has been provided to allow determination of volumes of all retained species landed in conjunction with the Danish demersal trawl fishery landing hake. This information is both accurate and verifiable and provides data to inform the status of these species and to inform the associated TACs and quotas. Information is recorded within a 5% tolerance on onboard logbooks for all retained species. Information is collected centrally by the Ministry and is adequate to determine the risk posed by the fishery as well as the effectiveness of the partial strategy to manage retained species. Information on retained species catch can be verified from source log sheets and can be cross referenced with landings inspection reports and at sea inspection reports. It is concluded that sufficient data continue to be collected to detect any increase in risk level.</p> <p>Information is assessed as being sufficient to estimate outcome status with respect to biologically based limits and adequate to support partial strategies to manage main retained species. All of the SG80 issues are therefore met and a score of 80 awarded.</p>				
References				
» DTU Aqua. 2010. Landings statistics				
» ICES 2009, Book 6 and Book 9 Fisheries advice				

Set nets				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.3	Information monitoring Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.	<u>Qualitative information</u> is available on the amount of main retained species taken by the fishery.	<u>Qualitative information</u> 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.
		Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits. Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.	Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits. Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species. Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of certainty</u> . Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
Score: 90				
Summary: Set nets Accurate data has been provided to allow determination of volumes and value of all retained species landed in conjunction with the set net fishery landing hake, This information is both accurate and verifiable and provides data to inform the status of these species and to inform the associated TACs and quotas. Information is recorded within a 5% tolerance on onboard logbooks for all retained species. Information is collected centrally by the Ministry and is adequate to determine the risk posed by the fishery as well as the effectiveness of the strategy to manage retained species. Information on retained species catch can be verified from source log sheets and can be cross referenced with landings inspection reports and at sea inspection reports. It is concluded that monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species. Information is assessed as being sufficient to estimate outcome status with respect to biologically based limits and adequate to support partial strategies to manage main retained species. All of the SG80 issues are therefore met. All retained species are recorded and data on catches and stock status is sufficient to determine consequences for populations of all retained species. Monitoring of retained species is sufficiently detailed to facilitate estimation of ongoing mortalities to all retained species. The first and fourth SG100 issues have therefore been met and a score of 90 is appropriate.				
Justification: Set nets Estimates of the quantities of retained species landed in conjunction with hake in Danish set net fisheries the North Sea and Skagerrak are based on catch composition data provided by the client, based on 2012 official logbook data obtained from the Danish AgriFish Agency from all MSC listed vessels, filtered for days when hake was part of the retained catch. These summary statistics therefore show retained species catch weights only for trips that actually caught hake and which are therefore representative of the UoC under consideration. Set nets aimed at sole, for example, which do not take hake, are therefore excluded. These data have been used to identify main (i.e. >5% of total catch) and other retained species for the set net UoC, split by North Sea and Skagerrak as appropriate to check if there are any substantive differences by fishing area. It was assessed that information is sufficient to estimate outcome status of the retained species.				

Information is adequate to support the strategies presented in 2.1.2. However it is assessed by the team that information is not always adequate to assess with a high degree of certainty whether the strategy is achieving its objective (Sib) or to support comprehensive strategies. (Slc).

Information available for the retained species associated with the set nets fisheries meet all of the SG80 issues as well as Sla and Sib at SG100.

References

- » DTU Aqua. 2010. Landings statistics
- » ICES 2009, Book 6 and Book 9 Fisheries advice

Long line				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.3	Information monitoring / Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.	<u>Qualitative information</u> is available on the amount of main retained species taken by the fishery. Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits. Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.	<u>Qualitative information</u> and some quantitative information are available on the amount of main retained species taken by the fishery. Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits. Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species. Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations. Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of certainty</u> . Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
Score: 80				
Justification: Long line				
<p>The Danish long line fishery had not been practiced for some years, but some vessels have recently been equipped for this fishery and have resumed longlining. These vessels are < 15 m and do not complete EU log books. However, data on landings of three out of four long-line vessels that are currently practicing this fishery have been provided to the team by the client; for one vessel covered the whole year 2010; and for two other vessels for part of 2010. The longline fishery takes mainly cod. Longlining is known to be a highly size selective means of fishing and discarding is not a significant feature for this means of fishing.</p> <p>This information on retained species catch can be verified from source log sheets and can be cross-referenced with landings inspection reports and at sea inspection reports. It is concluded that sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy). Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species associated with the long line fishery meets t of the SG80 issues and therefore <u>scores 80</u>.</p>				
References				
» DTU Aqua. 2010. Landings statistics				
» ICES 2013, Book 6 and Book 9 Fisheries advice				

2.2	Discarded species (also known as “bycatch” or “discards”)			
Demersal Trawl TR2 (70mm≤mesh size≤100mm)				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.1	Status The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.	Main bycatch species are likely to be within biologically based limits, or if outside such limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding. If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.	Main bycatch species are highly likely to be within biologically based limits or if outside such limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	There is a high degree of certainty that bycatch species are within biologically based limits.
Score: 80				
<p>Summary: Demersal trawl < 100 mm mesh size</p> <p>A number of by catch species have already been scored as retained species (2.1.1) and there are no main by catch species. Long rough dab is a minor by catch species, and rays and roundnose grenadier may be vulnerable species that should also be considered.</p> <p>Since there are no main by catch species, SG80 is satisfied. Though the status of long rough dab and starry ray stocks in the North Sea and Skagerrak is unknown, the long rough dab and starry ray stocks appear to be stable and are highly likely to be within biologically based limits, and it is assessed that the discard management strategy (described under 2.2.2) provides sufficient mitigation to ensure that the hake demersal trawl fishery does not hinder the recovery and rebuilding of these stocks, and meets all of the bycatch species outcome status SG60 and SG80 issues and therefore <u>scores 80</u>. The status of the Roundnose grenadier stock in the Skagerrak is also unknown, though there is a partial strategy in the form of a TAC and therefore mitigation is sufficient to ensure that the hake trawl fishery does not hinder the recover or rebuilding of this stock. Roundnose grenadier meets all of the bycatch species outcome status SG60 and SG80 issues and therefore <u>scores 80</u>.</p> <p>According to Table C2, a <u>score of 80 is awarded</u>, since all scoring elements meet SG 80.</p>				
Justification: Demersal trawl < 100 mm mesh size				
<p>All units of certification have in place measures that are specifically designed to reduce or eliminate discarding. The European ban on high grading that came into force on 1st January 2010 acts to minimize discarding across all North Sea and Skagerrak fisheries, although the level of enforcement is not known. The Norwegian ban on discarding is strictly enforced and applies to Danish vessels fishing within the Norwegian EEZ, where there are closed areas including Real Time Closures specifically designed to protect juvenile nursing grounds. Since 1st January 2013, the Norwegian discard ban is also in force for EU vessels fishing in the Skagerrak, and it is expected that the discard ban in EU waters of Skagerrak will be implemented simultaneously with that in the North Sea.</p> <p>The quantities of species discarded by the Danish demersal trawl fleet operating in the North Sea and Skagerrak in 2008 were estimated using observer trip discard percentages, averaged over a running 4-year period and then multiplied with the total landings of all species for the demersal trawl fleet for the full year (2008, in this case) (DTU Aqua, 2011). These data indicate that the highest proportion of discards is of cod (24% of all discards by weight) followed by <i>Nephrops</i> (22%) and starry ray (19%), haddock, saithe, plaice, long rough dab, common dab and hake. In the towed gear fisheries, many of the technical measures have stipulated changes to codend mesh size or the inclusion of square-mesh escape panels in order to reduce discards (Enever et al, 2009).</p> <p>More recent data on landings and discards are available from STECF, related to effort management under the long-term cod management plan, covering the period 2010-2012. However, several UoCs are combined in some datasets</p>				

(e.g. TR1 = all towed gears > 100 mm, including Danish Seine; and TR2 all towed gear <100 mm) and the data include all Danish effort with that particular gear – including métiers that do not catch hake (especially applies to set nets). Table 4.1 presents a summary of the data set for TR2, for the North Sea and Skagerrak separately, omitting any species (other than ETP species) the average annual catches of which amounted to less than one t over the years 2010 – 2012, that individually comprise <1% of the total by weight, or have negligible discards.

The main discarded by catch species (>5% of total catch) in the TR2 (cod end < 100 mm) UoC in the North Sea are **dab**, **Nephrops** and **plaice**, whilst **anglerfish**, **cod**, **lemon sole** and long rough dab and **witch** are minor retained species that comprise more than a negligible proportion (>1%) of the catch. Rays may be vulnerable species that are discarded in significant quantities.

The main discarded by catch species in the TR2 UoC in the Skagerrak are **cod**, **haddock**, **Nephrops**, **plaice**, **saithe** and **witch**, whilst **dab**, **lemon sole**, long rough dab and whiting are minor retained species that comprise more than a negligible proportion (>1%) of the catch. *Chimaera monstrosa*, spurdog, rays and roundnose grenadier may be vulnerable species that are discarded in significant quantities.

Species that have already been scored in the respective retained species (2.1.1) are shown in bold. This indicates that only long rough dab and whiting should be considered here as by catch species. Rays and roundnose grenadier may be vulnerable species that should also be considered.

Long rough dab: The long rough dab is an abundant flatfish species within the North Sea, Skagerrak and Kattegat, though its stock status is unknown. In 2004 Fraser and Greenstreet reported that long rough dab biomass in the North Sea has remained relatively constant over a six-year period from 1998 to 2003. It is assessed that the discard management strategy (described under 2.2.2) provides sufficient mitigation to ensure that the hake demersal trawl fishery does not hinder the recovery and rebuilding of the long rough dab stock, and meets all of the bycatch species outcome status SG60 and SG80 issues and therefore scores 80.

Roundnose grenadier: ICES 2009 advice states that due to its low productivity, roundnose grenadier can only sustain low rates of exploitation and that the fishery should not be allowed to expand unless it can be shown that it is sustainable. The status of the stock in the Skagerrak is unknown, though there is a partial strategy in the form of a TAC and therefore mitigation is sufficient to ensure that the hake trawl fishery does not hinder the recover or rebuilding of this stock. Roundnose grenadier meets all of the bycatch species outcome status SG60 and SG80 issues and therefore scores 80.

Starry ray: In the central and northern North Sea, starry ray *Amblyraja radiata* is the most abundant skate and ray species. Observer data reveals that this species is discarded in high volumes in both the North Sea and Skagerrak, chiefly because the species is of little commercial importance due to its small size and lack of 'wing' flesh. Elasmobranchs are typically slow growing, have a high age-at-maturity and a low reproductive capacity. ICES advise that measures to afford protection to the largest individuals should be considered. The starry ray is one of the smallest species of skate and ray with normal maximum growth up to 70 cm. ICES describe the starry ray stock as stable, and it is listed as of least concern on the IUCN list. From the available evidence it is assessed that the starry ray is highly likely to be within biologically based limits. Starry ray in the North Sea and Skagerrak meets all of the bycatch species outcome status SG60 and SG80 issues and therefore scores 80.

References

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- » Floeter J., Kempf A., Vinther M., Schrum C. and Temming A. (2005) Grey gurnard (*Eutrigla gurnadus*) in the North Sea: an emerging key predator? *Can. J. Fish. Aquat. Sci.* 62(8): 1853–1864
- » ICES 2009 Book 9: 9.4.15 Roundnose grenadier (*Coryphaenoides rupestris*) in all areas
- » ICES Advice for Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice 2013, Book 6. 6.4.7
- » ICES Advice for Saithe in Subarea IV (North Sea), Division IIIa (Skagerrak), and Subarea VI (West of Scotland and Rockall) ICES Advice 2013, Book 6. 6.4.21
- » ICES Advice for Plaice in Subdivision 20 (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.17
- » ICES Advice for Cod in Subarea IV (North Sea) and Divisions VIId (Eastern Channel) and IIIa West (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.3
- » ICES Advice for Nephrops in Division IIIa. ICES Advice 2013. Book 6 Section 6.4.14

- » ICES Advice for Nephrops in Subarea IV (North Sea). ICES Advice 2013. Book 6 Section 6.4.15b
- » ICES Fish Map: Grey Gurnard [http://www.ices.dk/marineworld/fishmap/ices/default.asp?id=Grey Gurnard](http://www.ices.dk/marineworld/fishmap/ices/default.asp?id=Grey%20Gurnard)
- » Rijnsdorp A. D., Vethaak A. And van Leeuwen 1992. Population biology of dab *Limanda limanda* in the southeastern North Sea Mar. Ecol. Prog. Ser Vol 91: 19-35.
- » Seafish (2009) Responsible sourcing guide: skates & rays
- » Vinther and Sparholt (1991) The biomass of starry ray (*Raja radiata*) in the North Sea. Journal du Conseil: ICES Journal of Marine Science 1991 47(3):295-302

2.2	Discarded species (also known as “bycatch” or “discards”)			
Demersal trawl TR1 (mesh size≥ 100 mm)				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.1	Status The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.	Main bycatch species are likely to be within biologically based limits, or if outside such limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding. If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.	Main bycatch species are highly likely to be within biologically based limits or if outside such limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	There is a high degree of certainty that bycatch species are within biologically based limits.
Score: 80				
Summary: Demersal trawl > 100 mm mesh size A number of by catch species have already been scored as retained species (2.1.1) and only dab and rays should be considered here as by catch species. Both these species are considered to be highly likely to be within biologically based limits based on the most recently available advice for those stocks. There is a partial strategy in place (TACs, MLS/MMS, area closures etc) of which the management measures are demonstrably effective and ensure the hake demersal trawl does not hinder stock recovery and rebuilding. They therefore score at SG80. According to Table C2, a <u>score of 80 is awarded</u> , since all scoring elements meet SG 80.				
Justification: Demersal trawl > 100 mm mesh size				
All units of certification have in place measures that are specifically designed to reduce or eliminate discarding. The European ban on high grading that came into force on 1st January 2010 acts to minimize discarding across all North Sea and Skagerrak fisheries, although the level of enforcement is not known. The Norwegian ban on discarding is strictly enforced and applies to Danish vessels fishing within the Norwegian EEZ, where there are closed areas including Real Time Closures specifically designed to protect juvenile nursing grounds. Since 1 st January 2013, the Norwegian discard ban is also in force for EU vessels fishing in the Skagerrak, and it is expected that the discard ban in EU waters of Skagerrak will be implemented simultaneously with that in the North Sea. The quantities of species discarded by the Danish demersal trawl fleet operating in the North Sea and Skagerrak in 2008 were estimated using observer trip discard percentages, averaged over a running 4-year period and then multiplied with the total landings of all species for the demersal trawl fleet for the full year (2008, in this case) (DTU Aqua, 2011). These data indicate that the highest proportion of discards is of cod (24% of all discards by weight) followed by <i>Nephrops</i> (22%), and starry ray (19%) haddock, saithe, plaice, long rough dab, dab and hake. In the towed gear fisheries, many of the technical measures have stipulated changes to codend mesh size or the inclusion of square-mesh escape panels in order to reduce discards (Enever et al, 2009). More recent data on landings and discards are available from STECF, related to effort management under the long-term cod management plan, covering the period 2010-2012. However, several UoCs are combined in some datasets (e.g. TR1 = all towed gears > 100 mm, including Danish Seine; and TR2 all towed gear <100 mm) and the data include all Danish effort with that particular gear – including métiers that do not catch hake (especially applies to set nets). Table 4.2 presents a summary of the data set for TR1, for the North Sea and Skagerrak separately, omitting any				

species (other than ETP species) the average annual catches of which amounted to less than one t over the years 2010 – 2012, that individually comprise <1% of the total by weight, or have negligible discards.

The main discarded by catch species (>5% of total catch) in the TR1 (>100 mm mesh) UoC in the North Sea are **anglerfish**, **cod**, **plaice** and **pollack**, whilst **dab**, **haddock**, **ling**, **Nephrops**, rays and **witch** are minor by catch species that comprise more than a negligible proportion (>1%) of the catch.

The main discarded by catch species in the TR1 UoC in the Skagerrak are **cod**, **dab**, **haddock** and **plaice**, whilst **lemon sole**, **Nephrops**, **saithe** and **witch** are minor by catch species that comprise more than a negligible proportion (>1%) of the catch. Spurdog and rays may be vulnerable species that are discarded in significant quantities in both areas. Spurdog are covered under ETP species.

Species that have already been scored as retained species (2.1.1) are shown in bold. This indicates that only dab and rays should be considered here as by catch species (as per FAM Section 7.1.5 and 7.3.1).

Common dab: According to IBTS Q1 data for the North Sea, the abundance of dab has increased substantially in the long-term (at least to 2005), in part related to opportunistic adaptations to trawl fisheries and the restrictions on effort associated with the plaice and sole management plan. While the status of the stock is unknown, dab is managed by TACs in the North Sea. This, together with discard management strategy, provides sufficient mitigation to ensure that the hake demersal trawl fishery does not hinder the recovery and rebuilding of dab in the North Sea. Common dab in the North Sea meets all of the bycatch species outcome status SG60 and SG80 issues and therefore scores 80.

Starry ray: In the central and northern North Sea, starry ray *Amblyraja radiata* is the most abundant skate and ray species. Observer data reveals that this species is discarded in high volumes in both the North Sea and Skagerrak, chiefly because the species is of little commercial importance due to its small size and lack of 'wing' flesh. Elasmobranchs are typically slow growing, have a high age-at-maturity and a low reproductive capacity. ICES advise that measures to afford protection to the largest individuals should be considered. The starry ray is one of the smallest species of skate and ray with normal maximum growth up to 70 cm. ICES describe the starry ray stock as stable, and it is listed as of least concern on the IUCN list. From the available evidence it is assessed that the starry ray is highly likely to be within biologically based limits. Starry ray in the North Sea and Skagerrak meets all of the bycatch species outcome status SG60 and SG80 issues and therefore scores 80.

References

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- » DTU Aqua. 2010. Discard observer data for demersal trawl and Danish seine from 2000 to 2008.
- » Enever R., Revill A.S., Grant A. 2009. Discarding in the North Sea and on the historical efficacy of gear-based technical measures in reducing discards *Fisheries Research* 95 (2009) 40–46
- » Floeter J., Kempf A., Vinther M., Schrum C. and Temming A. (2005) Grey gurnard (*Eutrigla gurnadus*) in the North Sea: an emerging key predator? *Can. J. Fish. Aquat. Sci.* 62(8): 1853–1864
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- » ICES Advice for Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak). ICES Advice 2013, Book 6. 6.4.7
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- » ICES Advice for Plaice in Subdivision 20 (Skagerrak). ICES Advice 2013. Book 6 Section 6.4.17
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Danish seine				
2.2.1	Status	Main bycatch species are <u>likely</u> to be within biologically based limits, or if outside such limits there are mitigation <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding.	Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that bycatch species are within biologically based limits.
		If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.		
Score: 80				
Summary: Danish seine				
A number of by catch species have already been scored as retained species (2.1.1) and starry ray, dab and long-rough dab should be considered here as by catch species for the Danish seine UoC (as per Table 4.12) (FAM Section 7.1.5 and 7.3.1). All stocks score at SG80 for 2.2.1. The minor bycatch species, as listed below, are assessed as being either highly likely to be within biologically based limits (or have a partial strategy in place (TACs, size standards, area closures etc) of which the management measures are demonstrably effective and ensure the fishery does not hinder recover or rebuilding. According to Table C2, a <u>score of 80 is awarded</u> , since all scoring elements meet SG 80.				
Justification: Danish seine				
All units of certification have in place measures that are specifically designed to reduce or eliminate discarding. The European ban on high grading that came into force on 1st January 2010 acts to minimize discarding across all North Sea and Skagerrak fisheries, although the level of enforcement is not known. The Norwegian ban on discarding is strictly enforced and applies to Danish vessels fishing within the Norwegian EEZ, where there are closed areas including Real Time Closures specifically designed to protect juvenile nursing grounds. Since 1 st January 2013, the Norwegian discard ban is also in force for EU vessels fishing in the Skagerrak, and it is expected that the discard ban in EU waters of Skagerrak will be implemented simultaneously with that in the North Sea.				
The main bycatch species in the Danish seine in the Skagerrak have been identified from Table 4.12 as long rough dab, dab and starry ray. Cod, haddock and plaice are also discarded but are considered under the retained species PI.				
Bycatch species stock status				
Starry ray: In the central and northern North Sea, starry ray <i>Amblyraja radiata</i> is the most abundant skate and ray species. Observer data reveals that this species is discarded in high volumes in both the North Sea and Skagerrak, chiefly because the species is of little commercial importance due to its small size and lack of 'wing' flesh. Elasmobranchs are typically slow growing, have a high age-at-maturity and a low reproductive capacity. ICES advise that measures to afford protection to the largest individuals should be considered. The starry ray is one of the smallest species of skate and ray with normal maximum growth up to 70 cm. ICES describe the starry ray stock as stable, and it is listed as of least concern on the IUCN list. From the available evidence it is assessed that the starry ray is highly likely to be within biologically based limits. Starry ray in the North Sea and Skagerrak meets all of the bycatch species outcome status SG60 and SG80 issues and therefore <u>scores 80</u> .				
Long rough dab: The long rough dab is an abundant flatfish species within the North Sea, Skagerrak and Kattegat, though its stock status is unknown. In 2004 Fraser and Greenstreet reported that long rough dab biomass in the North Sea has remained relatively constant over a six-year period from 1998 to 2003. It is assessed that the discard management strategy (described under 2.2.2) provides sufficient mitigation to ensure that the hake demersal trawl				

fishery does not hinder the recovery and rebuilding of the long rough dab stock, and meets all of the bycatch species outcome status SG60 and SG80 issues and therefore scores 80.

Dab - Dab is a widespread demersal species on the Northeast Atlantic shelf and distributed from the Bay of Biscay to Iceland and Norway; including the Barents Sea and the Baltic. Dab is one of the most abundant demersal species in the North Sea with its centre of distribution in the Southern North Sea. Survey indices show a stable abundance in the last decades in Subarea IV which is the main part of the distribution area and an increasing abundance for Division IIIa. The most recent ICES advice (2013) suggests that the stock size indicator (number/hour) in the last three years (2010–2012) is 7% higher (North Sea) or 16% higher (Skagerrak–Kattegat) than the average of the five previous years (2005–2009). On the basis of the available evidence it is considered that dab is highly likely to be within biologically based limits and therefore scores SG80.

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Set nets				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.1	Status The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.	Main bycatch species are likely to be within biologically based limits, or if outside such limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding. If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.	Main bycatch species are highly likely to be within biologically based limits or if outside such limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	There is a high degree of certainty that bycatch species are within biologically based limits.
Score: 80				
Summary: Set nets A number of by catch species have already been scored as retained species (2.1.1). Cod, haddock, plaice, saithe and turbot have been considered under the retained species PI. Given that there are no main bycatch species, a score of 80 is automatically achieved. Bird bycatch has been considered and due to the fact that hake are associated with deeper waters and setnet gears that catch hake are set at depths where diving birds are highly unlikely to be encountered, bird bycatch is considered to be minimal and meets with SG80. Common dab is considered as a minor by catch species in the North Sea and in the Skagerrak setnet fishery. Dab is a widespread demersal species on the Northeast Atlantic shelf and distributed from the Bay of Biscay to Iceland and Norway; including the Barents Sea and the Baltic. Dab is one of the most abundant demersal species in the North Sea with its centre of distribution in the Southern North Sea. Survey indices show a stable abundance in the last decades in Subarea IV which is the main part of the distribution area and an increasing abundance for Division IIIa. The most recent ICES advice (2013) suggests that the stock size indicator (number/hour) in the last three years (2010–2012) is 7% higher (North Sea) or 16% higher (Skagerrak–Kattegat) than the average of the five previous years (2005–2009). On the basis of the available evidence it is considered that dab is highly likely to be within biologically based limits and therefore scores SG80. As dab is the only scoring element and does not achieve any scores at SG100, according to Table C2, a <u>score of 80 is met.</u>				
Justification: Set nets				
Data on landings and discards by species that were collected on observer trips on Danish gill net vessels in the North Sea over the period 1995-2010 were available to the team, though only two such observer trips were made after 2005. From the complete data set it appears that the catches of a number of species are relatively low, and that the highest levels of discarding are of common dab and starry ray. Data on landings and discards available from STECF, covering the period 2010-2012, include all Danish effort with set nets. Landings and discard data are summarised in Section 4 of the main report , for the North Sea and Skagerrak separately, omitting any species (other than ETP species) the average annual catches of which amounted to less than one t over the years 2010 – 2012, that individually comprise <1% of the total by weight, or have negligible discards (unless ETP species).				

The main discarded by catch species (>5% of total catch) in the Gill net UoC in the North Sea is **cod**, whilst **plaice**, **turbot and dab** are minor by catch species that comprises more than a negligible proportion (>1%) of the catch. Spurdog and rays may be vulnerable species that are discarded in significant quantities. Spurdog are covered under ETP species.

The main discarded by catch species in the Trammel net UoC in the North Sea is, **cod**, whilst **plaice** and dab are minor by catch species that comprise more than a negligible proportion (>1%) of the catch.

The main discarded by catch species in the Gill net UoC in the Skagerrak are **cod**, **plaice** and **pollack**, whilst dab and **saithe** are minor by catch species that comprise more than a negligible proportion (>1%) of the catch.

The main discarded by catch species (>5% of total catch) in the Trammel net UoC in the Skagerrak are **cod** and **plaice**, whilst the only minor by catch species that comprises more than a negligible proportion (>1%) of the catch is dab. Species that have already been scored as retained species (2.1.1 set nets) are indicated above in bold. This indicates that there are no main bycatch species and only dab is considered as a minor by catch species in both the North Sea and the Skagerrak (as per FAM Section 7.1.5 and 7.3.1). Spurdog and rays may be vulnerable species that are discarded in significant quantities. Spurdog are covered under ETP species.

Ghost fishing by lost set nets is considered under bycatch since one of the major impacts related to this gear use is ongoing unrecorded mortality of target and non target species.

Set nets have the ability to continue to catch fish for varying periods of time in the event that they become lost, so called “ghost fishing”. Gear can be lost in a number of ways – it can become tangled up with mobile gears, can be swept away in extremes of current and or weather, or surface buoys that mark the gears location can become separated from the gear. However, anecdotal evidence collated during the site visit suggests that lost gear incidents rarely occur and that fishermen try very hard to avoid gear loss, as it results in expensive replacement costs, and it is normal for vessels to attempt to recover lost gear it by grappling for it on the seabed. Fishermen are required to record the amount of gear that they leave port with and they must account for it on their return, in the onboard logbooks. In this way it is possible to estimate the total quantity of gear that is lost in set net fisheries, although this does not currently appear to happen.

Those nets that are lost on open ground are shown to undergo an initial sharp decrease in net height followed by a prolonged period of slow decrease in net height and increased degradation and tangling due to catches and biofouling. Programmes to examine the impact of ghost fishing have been performed such as the EU FANTARED 2 project and the recent review undertaken for FAO (Macfadyen *et al.*, 2009).

In this fishery, the risks to bycatch species associated with ghost fishing by lost gear are considered to be low, given the scale of the setnet fishery, the manner in which the fishery avoids periods of severe weather and strong tides (when gear loss is more likely) and the type of ground over which the fishery takes place (whereby lost nets can normally be recovered by grappling, a process aided by the use of modern fishing and navigation electronics).

References

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2.2.1	Status The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.	Main bycatch species are <u>likely</u> to be within biologically based limits, or if outside such limits there are mitigation <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding. If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.	Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that bycatch species are within biologically based limits.
Score: 80				
Justification: long line				
<p>Because the Danish long line fishery is a new fishery no observer trips on these vessels have been carried out yet. The client has provided the team with some anecdotal data on discards. It is stated that per fishing day up to 5 starry rays can be caught. The team considered that it is likely that this by catch results in a discard percentage much lower than 5 %. In the central and northern North Sea, starry ray <i>Amblyraja radiata</i> is the most abundant skate and ray species. Observer data reveals that this species is discarded in high volumes in both the North Sea and Skagerrak, chiefly because the species is of little commercial importance due to its small size and lack of 'wing' flesh. Elasmobranchs are typically slow growing, have a high age-at-maturity and a low reproductive capacity. ICES advise that measures to afford protection to the largest individuals should be considered. The starry ray is one of the smallest species of skate and ray with normal maximum growth up to 70 cm. ICES describe the starry ray stock as stable, and it is listed as of least concern on the IUCN list. From the available evidence it is assessed that the starry ray is highly likely to be within biologically based limits. Starry ray in the North Sea and Skagerrak meets all of the bycatch species outcome status SG60 and SG80 issues and therefore <u>scores 80</u>. Bird bycatch has also been considered. Longline gears may capture birds that attempt to forage on baited hooks. Due to the fact that hake are associated with deeper waters and the fact that no hake catch is associated with longline gears (despite this UoC being in certification), diving birds are highly unlikely to be encountered. Therefore bird bycatch is considered to be minimal and meets with SG80.</p> <p>Although there is a lack of information on discards in the long line fishery taking hake (which is dealt with at 2.2.3), the overall conclusion is that there are no main discarded species in the long line fishery. A score of 80 is thus automatically awarded. However it is not possible to score at Sg100 as there is no basis on which to identify ALL r bycatch species (sampling data).</p>				
References				
<p>» Seafish (2009) Responsible sourcing guide: skates & rays</p> <p>» Vinther and Sparholt (1991) The biomass of starry ray (<i>Raja radiata</i>) in the North Sea. Journal du Conseil: ICES Journal of Marine Science 1991 47(3):295-302</p>				

Demersal Trawl TR2 and TR1, Danish seine, set nets and long line				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.2	Management strategy There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations.	There are measures in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.	There is a partial strategy in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.	There is a strategy in place for managing and minimising bycatch.
		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 the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports high confidence that the strategy will work.
			There is some evidence that the partial strategy is being implemented successfully.	There is some evidence that the strategy is achieving its objective.
			There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring.	
TR2 80 TR1 95 Scores: Danish seine 95 Set net 85 Long line 80				
Summary: Demersal trawl <100 mm mesh (TR2) It is assessed that for the TR2 fishery the smaller mesh size used results in higher discards rates than are seen in the TR1 fisheries. It is therefore assessed that there are <u>partial</u> strategies in place for managing and minimising discards. Many of these have primarily been developed for protection of juvenile cod, but in doing so also protect other fish species. Of particular importance is the ban on high grading. Some evidence is available to demonstrate that these strategies are being implemented successfully and the intended changes are occurring.				
Demersal trawl > 100 mm mesh (TR1) and Danish seine It is assessed that there are strategies in place for managing and minimising discards. Many of these have primarily been developed for protection of juvenile cod, but in doing so also protect other fish species. Of particular importance is the ban on high grading. Some evidence is available to demonstrate that these strategies are being implemented successfully and the intended changes are occurring.				
Set nets It is assessed that there are partial strategies in place for managing and minimising discards. Many of these have primarily been developed for protection of juvenile cod, but in doing so also protect other fish species. Of particular importance is the ban on high grading. Some evidence is available to demonstrate that these strategies are being implemented successfully and the intended changes are occurring.				
Long line It is assessed that the gear is inherently selective; meaning less management response is needed. There are partial strategies in place for managing and minimising discards at EU, national and DFPO level. Some evidence is available				

to demonstrate that these strategies are being implemented successfully and discard rates associated with longlining are low.

Justification: Demersal trawl

There is a partial strategy in place for managing bycatch (discarded) species in all Danish fisheries, including the following measures:

- » Closed areas
- » Technical gear restrictions
- » Cod recovery plan and days at sea
- » Ban on high grading
- » Ban on discards in Norwegian zone
- » Observer programmes and Fully Documented Fishery
- » DFPO Code of Conduct (lost gear)

Closed areas, technical gear restrictions, the cod recovery plan and days at sea have been discussed under 2.1.2 for retained species. Although the details are not repeated in this section, these measures are appropriate to bycatch species and have been taken into consideration for scoring.

Ban on high grading

High-grading is the practice of discarding low-value small fish in order to fill the quota allotted with higher-value big fish and therefore increase the value of the catch.

The Danish Directorate of Fisheries issued an Ordinance regulating the fisheries in 2010 and some fisheries conditions in subsequent years (Control Order 2010) in December 2009. Under Annex 7 of this Control Order it is forbidden to discard certain species (Table 2) if they can be landed legally i.e. within minimum landing size.

Table 2 Species listed under Annex 7 of Control Order 2010 (Danish Directorate of Fisheries, 2009)

Species illegal to high grade			
Blue ling	Haddock	<i>Nephrops</i>	Sandeel
Blue whiting	Hake	Norway pout	Skate
Brill	Herring	<i>Pangasus</i>	Sole
Capelin	Horse mackerel	Plaice	Sprat
Cod	Lemon sole	Porbeagle shark	Spurdog
Dab	Ling	Ray	Turbot
Flounder	Mackerel	Roundnose grenadier	Tusk
Greater argentine	Megrim	Saithe	Whiting
Greenland halibut	Anglerfishfish	Salmon	Witch

While this ban on high grading is not easily enforceable at sea, it should be detectable through monitoring the size distribution of landings.

Ban on discards in Norwegian zone

Norway introduced a ban on discards in 1987 specifically for cod stocks. This discard ban is now in place for most commercial fish species in Norwegian waters.

Observer programmes and Fully Documented Fishery

Observer trips are required for a certain proportion of specific fishing fleets to record discard levels associated with the fishery. Data from demersal trawl and Danish seine observer trips during 2000-2008 were provided for this assessment.

As an alternative to on-board observers, DTU Aqua has piloted a Fully Documented Fishery scheme from 2008-2009 on 6 vessels. The scheme uses CCTV to record discards (primarily focused on cod) and issues Catch Quotas to vessels to allow for the discarded/undersized fish to be accounted against the vessel's quota. To date the scheme has tested the use of CCTV to record discards and has found it to be accurate and more economically viable than the use of on-board observers. Data on levels of discards from this scheme have been collated but are not publically available. The scheme was extended in 2010 to 30 Danish vessels.

DFPO Code of Conduct

The DFPO have developed a Code of Conduct which states:

"We seek to minimise the environmental consequences of our fishing by ... being generally aware of the optimal use of our gear. We do our utmost to bring up lost fishing-gear, help each other with this whenever we can – and when the gear cannot be brought up it is recorded in the attached form."

Individual DFPO vessel use of MSC certificates will be subject to them signing up to and comply with the Code of Conduct.

While it is understood that this Code of Conduct works towards minimising and recording loss of gear, it is not possible to define it as a strategy because it has not been demonstrated to be working which is a clear requirement under FAM Section 7.1.22. It is therefore considered part of a partial strategy.

Mesh size used TR2

In the trawl fishery using smaller mesh sizes than 100 mm (TR2) there are significant higher discard rates of undersized fish (STECF, 2010). Although these higher discard rates for a large part concerns commercial fish species that have been assessed under retained species, the team came to the conclusion that the management strategy for managing bycatch for the trawl fishery using mesh size < 100 mm is only partial and should score lower than the management strategy for trawl fisheries that use mesh sizes larger > 100 mm. The use of a smaller mesh size can be seen as a less effective strategy of reducing bycatch of all species.

Mesh size used TR1 and Danish seine

In the trawl fishery using mesh sizes larger than 100 mm (TR1) there are significant lower discard rates of undersized fish than in TR2 fisheries (STECF, 2010). Although these lower discard rates for a large part concerns commercial fish species that have been assessed under retained species, the team came to the conclusion that the management strategy for managing bycatch for the trawl fishery using mesh size >100 mm is a more comprehensive strategy and should score higher than the management strategy for trawl fisheries that use mesh sizes < 100 mm. The use of a larger mesh size can be seen as a more effective strategy of reducing bycatch of all species.

Score TR2

It is assessed by the team that there are partial strategies in place for managing and minimising bycatch (discards), and there is some objective basis for confidence that the partial strategy will work. In particular the Real Time Closures and ban on high-grading have allowed these issues to be met.

While some testing has been undertaken it does not support with high confidence that the partial strategies will work. Furthermore while there is some evidence that the strategies are being implemented successfully, it is not clear that the intended changes are occurring.

It is assessed by the team that bycatch management strategies for Danish trawl fisheries (TR2) meet all of the SG80 issues and therefore score 80.

Score TR1 and Danish seine

It is assessed by the team that there are strategies in place for managing and minimising bycatch (discards), and there is some evidence that these strategies are achieving their overall objective. In particular the Real Time Closures and ban on high-grading have allowed these issues to be met.

While some testing has been undertaken it does not support with high confidence that the strategies will work. Furthermore while there is some evidence that the strategies are being implemented successfully, it is not clear that the intended changes are occurring.

It is assessed by the team that bycatch management strategies for demersal trawl (TR1) and Danish seine fisheries meet all of the SG80 issues and the first and third SG100 issues and therefore score 95.

Score set nets

It is assessed by the team that there are partial strategies in place for managing and minimising bycatch (discards) in the set net fisheries, and there is evidence (low levels of discards, few species affected, good stock status for most affected species) that these strategies are achieving their overall objective (SG100).

While some testing has been undertaken it does not support with high confidence that the strategies will work. Furthermore while there is some evidence that the strategies are being implemented successfully, it is not clear that the intended changes are occurring.

It is assessed by the team that bycatch management strategies for set net fisheries meet all of the SG80 issues and one issue (b) at SG100. A score of 85 is achieved.

Score Long line

It is assessed by the team that there are partial strategies in place for managing and minimising bycatch (discards) in the long line fishery, and there is some evidence that these strategies are achieving their overall objective. The use of long line can be considered a partial strategy to reduce discards since it is a fishing technique that effectively selects for target species of larger size classes.

While some testing has been undertaken it does not support with high confidence that the strategies will work. From the catch data provided there is some evidence that the partial strategy is effective, however there is little evidence to support the evaluation of management strategies for reducing/limiting bird bycatch.

It is assessed by the team that bycatch management strategies for Danish long line fisheries meet all of the SG80 issues and therefore scores 80.

References

- » COMMISSION REGULATION (EC) No 356/2005 of 1 March 2005 laying down detailed rules for the marking and identification of passive fishing gear and beam trawls
- » COMMISSION REGULATION (EC) No 356/2005 of 1 March 2005 laying down detailed rules for the marking and identification of passive fishing gear and beam trawls
- » COUNCIL REGULATION (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy
- » Dalskov J. and Kindt-Larsen L. 2009. Fully Documented Fishery. DTU Aqua report no. 204
- » Danish Directorate of Fisheries (2009) Bekendtgørelse om regulering af fiskeriet i 2010 og visse vilkår for fiskeriet i følgende år (Reguleringsbekendtgørelsen 2010)
- » ICES CM 2009 ACOM Advisory Committee: 39 Report of the Planning Group on Commercial Catches, Discards and Biological Sampling
- » ICES CM 2009 FTC Fisheries Technology Committee:07 Report of the Working Group on Quantifying all Fishing Mortality
- » Seafish. 2009. Discards – new developments in 2009 as at 19 December 2009.
- » STECF 2010:

Demersal Trawl TR2 (70mm≤mesh size≤100mm)				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.3	Information / monitoring Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.	Qualitative information is available on the amount of main bycatch species affected by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.	<u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.
		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 <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u> .
		Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species. Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective. Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
Score: 85				
Summary: Demersal trawl Available data on discarding within the demersal trawl is quantitative and sufficient to estimate outcome status and support partial strategies for management. Data continues to be collected to detect any increase in risk posed by the fishery to these discarded species. Monitoring allows the ongoing mortality to be determined for all discarded species. A score of 85 is therefore awarded.				
Justification: Demersal trawl Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery (SG80). Ongoing fishing fleet discard sampling programmes provide accurate and verifiable data in relation to the nature and scale of discarding in the North Sea and Skagerrak trawl fisheries. Data provided by DTU is based on observer reporting. Based on data observer sampling data provided to the assessment the main discarded by catch species in the TR2 UoC are dab and starry ray . Whilst there are no stock assessments for any of the discarded species (dab, starry ray), information is adequate to estimate outcome status with respect to biologically based limits. There are reliable estimates of discarding levels and stock relative abundance is estimated for both dab and starry ray and is considered sufficient to estimate that these stocks are above the point where recruitment is being impaired. Information is adequate to support a partial strategy to manage main bycatch species. There is good data in terms of landings, including volumes and length–frequency from landings sampling as well as VMS data that confirms levels of fishing effort and areas fished. Survey data allow for catch indices to be developed and updated that allows for an estimate of relative abundance to be made and estimates updated. Sufficient data continue to be collected to detect any increase in risk to main bycatch species (SG80). Routine monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species				

(SG100). Bycatch sampling is conducted on an ongoing basis and records quantify all species captured and not retained. Data collected are adequate for monitoring bycatch rates and are used by DTU Aqua to evaluate ongoing mortalities to bycatch species.

It is assessed by the team that Information is adequate to support the strategies presented in 2.2.2 and that all SG 60 and SG80 issues are met. One scoring issue (c) is met at SG100. A score of 85 is achieved therefore.

References

- » DTU Aqua. 2010. Discard observer data for demersal trawl and Danish seine from 2000 to 2009.
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- » Ministry of Food. 2006. Report on discards in Danish Fisheries

Demersal trawl TR1 (mesh size≥ 100 mm) and Danish seine				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.3	Information / monitoring Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.	Qualitative information is available on the amount of main bycatch species affected by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.	<u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.
		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 <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u> .
		Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.
			Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
Score: 85				
Summary: Demersal trawl and Danish seine Available data on discarding within the demersal trawl and Danish seine fleets is quantitative and sufficient to estimate outcome status and support partial strategies for management. Data continues to be collected to detect any increase in risk posed by the fishery to these discarded species. Monitoring allows the ongoing mortality to be determined for all discarded species. A score of 85 is therefore awarded.				
Justification: Demersal trawl (TR1) and Danish seine Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery (SG80). Ongoing fishing fleet discard sampling programmes provide accurate and verifiable data in relation to the nature and scale of discarding in the North Sea and Skagerrak trawl fisheries. Data provided by DTU is based on observer reporting. Based on data observer sampling data provided to the assessment the main discarded by catch species in the TR1 and Danish seine UoCs are dab, long-rough dab and starry ray . Whilst there are no stock assessments for any of the discarded species (dab, long rough dab or starry ray), information is adequate to estimate outcome status with respect to biologically based limits. There are reliable estimates of discarding levels and stock relative abundance is estimated for both dab stocks and starry ray and is considered sufficient to estimate that these stocks are above the point where recruitment is being impaired. Information is adequate to support a partial strategy to manage main bycatch species. There is good data in terms of landings, including volumes and length–frequency from landings sampling as well as VMS data that confirms levels of fishing effort and areas fished. Survey data allow for catch indices to be developed and updated that allows for an estimate of relative abundance to be made and estimates updated.				

Sufficient data continue to be collected to detect any increase in risk to main bycatch species (SG80). Routine monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species (SG100). Bycatch sampling is conducted on an ongoing basis and records quantify all species captured and not retained. Data collected are adequate for monitoring bycatch rates and are used by DTU Aqua to evaluate ongoing mortalities to bycatch species.

It is assessed by the team that Information is adequate to support the strategies presented in 2.1.2 and that all SG 60 and SG80 issues are met. One scoring issue (c) is met at SG100. A score of 85 is achieved therefore

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- » Kelleher K. 2005 Discards in the world's marine fisheries: An update. FAO FISHERIES TECHNICAL PAPER 470
- » Ministry of Food. 2006. Report on discards in Danish Fisheries

Set nets				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.3	Information monitoring Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.	Qualitative information is available on the amount of main bycatch species affected by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.	<u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.
		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 <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u> .
		Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.
			Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
Score: 75				
Justification: Set nets				
<p>Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery. The fishing fleet discard sampling programme provides accurate and verifiable data in relation to the nature and scale of discarding in the North Sea and Skagerrak set net fisheries. Data provided by DTU is based on observer reporting.</p> <p>The level of information that is available in relation to discarding is sufficient to estimate outcome status with respect to biologically based limits for affected species and populations. Information is adequate to support a partial strategy to manage main bycatch species. Available qualitative and quantitative information in relation to bycatch for the fisheries is likely to be adequate and at least sufficient to support measures that serve to limit the impact of bycatch mortality on affected populations. Data in relation to spatial and temporal operation of the fishery is collected as are landings data. Though there is some monitoring of bycatch in the Danish setnet fishery, it is not specific to the fishery that targets hake and the results are presented for all set net fisheries combined. Observer coverage is at best intermittent. On this basis it is considered unlikely that sufficient data are collected to always identify increased risk within an appropriate timeframe. There is no indication that the fleet are committed to ongoing voluntary recording and reporting of discarding. This is considered less than best practice from a management perspective as the availability of updated information is fundamental to ongoing management of risks.</p> <p>The first three scoring issues at Sg80 are considered met however Sic is scored at Sg60. An overall score of 75 is achieved.</p>				

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- » DTU Aqua. 2010. Discard observer data for set net fishery from 1995 to 2009.
- » Fraser H. and Greenstreet S. 2004. 1ST Annual Report on Groundfish Assemblage Species Composition and Diversity. Fisheries Research Services Collaborative Report No 10/04
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- » Ministry of Food. 2006. Report on discards in Danish Fisheries

Long line

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.3	Information monitoring Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.	<u>Qualitative information is available on the amount of main bycatch species affected by the fishery.</u> <u>Information is adequate to broadly understand outcome status with respect to biologically based limits.</u> <u>Information is adequate to support measures to manage bycatch.</u>	<u>Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.</u> <u>Information is sufficient to estimate outcome status with respect to biologically based limits.</u> <u>Information is adequate to support a partial strategy to manage main bycatch species.</u> <u>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</u>	<u>Accurate and verifiable information is available on the amount of all bycatch and the consequences for the status of affected populations.</u> <u>Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.</u> <u>Information is adequate to support a comprehensive strategy to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.</u> <u>Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.</u>
Score: 75				
Justification: Long line				
Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery. Data considered in making the determination are taken from logbook records as well as from reporting of catches by the longline fleet as part of the Code of Conduct. Information suggests that there is very little bycatch overall and that there are no main bycatch species. The longline fishery is unlikely to impact any bycatch				

species at population level based on general understanding of the selectivity and catch profile for this gear type and it is considered highly unlikely that there are any main bycatch species in the fishery.

Information is sufficient to estimate outcome status with respect to biologically based limits. Fleet discard sampling programmes provide accurate and verifiable data in relation to the nature and scale of discarding in the North Sea and Skagerrak trawl, Danish seine and set net fisheries, however no direct data in relation to longline fisheries are available from this source. Despite this, sufficient data exist to indicate a low level of longlining activity and hence low levels of risk to bycatch species. Accordingly it is considered that risks to affected species populations are not significant.

Information is adequate to support measures to manage main bycatch species (SG60). There is ongoing collection of information in relation to fleet operation and landings. However, there is no clear sampling or observer strategy in place for the longline fleet which will provide additional qualitative and quantitative data from the fishery in relation to bycatch, in order to support management of impacts. This issue has been scored at SG60 as a consequence of the lack of clear observer data on discarding from the fishery.

Sufficient data continue to be collected in relation to vessel/fleet operation to detect changes increase in risk to bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).

References

- » Kelleher K. 2005 Discards in the world's marine fisheries: An update. FAO FISHERIES TECHNICAL PAPER 470

2.3	Endangered, Threatened and Protected (ETP) species
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Demersal Trawl TR2 and TR1

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.1	Status The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species. Known direct effects are unlikely to create unacceptable impacts to ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a <u>high degree of certainty</u> that the effects of the fishery are within limits of national and international requirements for protection of ETP species. There is a <u>high degree of confidence</u> that there are <u>no significant detrimental effects (direct and indirect)</u> of the fishery on ETP species.

Score:	TR2 80 TR1 80	
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Justification

As defined by the FAM v2 (July 2009), Endangered, Threatened and Protected species are those that are recognised by binding international agreement (e.g. CITES) or legislation (e.g. Council Regulation No 57/2011, Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) to which Denmark are a party.

The list of ETP species that corresponds to the above definition and which is considered under this Performance Indicator has been provided in Section 4 *Environmental Elements* of this report. An analysis of official Danish landings data along with evidence collected from fishermen suggests that Spurdog *Squalus acanthias* and Common skate *Dipturus batis* are the species of ETP that are most likely to be captured in the fishery using mobile gears.

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.

The most recent spurdog assessment undertaken by ICES was a benchmark carried out in 2011 using a delta-lognormal GLM-standardized index of abundance and a population dynamic model, which indicated a strong decline in spurdog total biomass to around 15% of pre-exploitation levels, which appears to have been driven by relatively high exploitation levels. This level of decline would justify an IUCN listing of 'Endangered', though the North-East Atlantic population is presently listed as *Critically Endangered* in the IUCN Red List (Fordham *et al.* 2006).

In 2012, ICES advised on the basis of the precautionary approach that there should be no targeted fishery for spurdog, that catches in mixed fisheries be reduced to the lowest possible level, and that a rebuilding plan should be developed for this stock. The prohibition of landing catches of spurdog by EU vessels has resulted in landings across all ICES subareas declining in recent years, though Sub-areas II–IV accounted for 70% of the total landings of spurdog in 2012 due to less restriction on the (Norwegian) fishery.

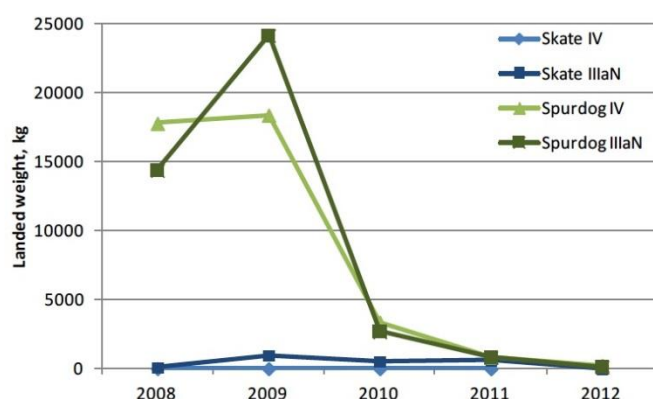
Landings data for 2010-12 reveal that approximately 20 t of spurdog were landed annually from the North Sea and Skagerrak by Danish fishing vessels using trawl and Danish seine gears, this area however includes non-EU Norwegian waters where discarding of spurdog and other species is illegal. In 2010, EU legislation restricting landings of Spurdog from EU waters to 10% of the previous year's quota for this species came into effect (Council Regulation 23/2010), while no landings from EU waters were permitted from 2011 onwards (Council Regulation 57/2011). While there should be no landings of spurdog from EU waters, 86 kg were recorded landed from the TR2 UoC in 2012. The client code of conduct requires all vessels to register discards of these species, amounting to 239 kg in TR1 and 261 kg from TR2: 261 kg in 2012. The DFPO is working on an ongoing basis to ensure that spurdog landings are eliminated

and the Fisheries Directorate have indicated confidence that spurdog landings are being phased out and are approaching zero, in keeping with legislative requirements. In the Norwegian zone, there is still a discard ban for spurdog – which means that all incidental bycatches of these must be landed (unless they can be released alive and considered viable). Landings from Norwegian waters were 1.4 t by the TR2 UoC (mainly from the Skagerrak) and 3.5 t by the TR1 UoC from the North Sea.

Common skate is now also assessed as *Critically Endangered* globally on the IUCN Red List of Threatened Species (Dulvy *et al.* 2006). Recent genetic research (Iglésias *et al.* in press 2009) indicates that the species reported as *Dipturus batis* is actually comprised of two species of *Dipturus* (provisionally *D. cf. flossada* and *D. cf. intermedia*), and that recorded landings of *D. batis* also include Norwegian skate *D. nidarosiensis*, particularly from deepwater fisheries. The implications of these observations are that members of the '*D. batis*' species complex are even more depleted than formerly understood. A prohibition for EU vessels to fish for, to retain on board, to transship or to land common skate in EU waters of ICES division IIa and ICES subareas III, IV, VI, VII, VIII, IX and X was introduced in 2010. In EU waters, 29 kg were recorded landed from the TR2 UoC in 2012 and 98 kg from TR1. The client vessels' discards of these species amounted to 106 kg from TR1 in 2012. In the Norwegian zone, there is still a discard ban for skate, and landings from Norwegian waters were 83 kg by the TR2 UoC and 4.6 t by the TR1 UoC.

The Danish Fisheries Directorate have indicated that common skate landings have been eliminated, however it is acknowledged that identification to species level is not always accurate or possible and there has been some lag in the full implementation of the landings ban related to lead in time needed for fleets to become aware and compliant with the new rule; the consequence being that small volumes are recorded in the landings from the EU zone. The clear trend however is towards total elimination of skate landings from the EU sector.

The graphic below indicates the dramatic reduction (elimination in practical terms) of spurdog and skate landings by DFPO vessels (all gear types) since 2010. Data are supplied by DFO using national landings database.



Both Harbour seal *Phoca vitulina* and Grey seal *Halichoerus grypus* occur within the North Sea and incidental capture of seals that are believed to have been foraging around mobile gears is recorded by Morizur *et al.* (1999). Occasional but rare occurrence of Harbour porpoise *Phocoena phocoena* mortality in mobile gear is documented by Fertl & Leatherwood (1997). Discussions with Danish fishermen suggest that while capture of marine mammals in mobile gears does occasionally occur, it is an exceptionally rare event and information from the fishery suggests that numbers killed or injured in this way are not significant and are highly unlikely to create unacceptable impacts to Harbour seal, Grey seal or Harbour porpoise populations in the North Sea or Skagerrak. Lunneryd *et al.* (2004) report that seal bycatch in Swedish commercial fisheries in the Baltic Sea is lowest for demersal whitefish gear types, although numbers are considered likely to have been underestimated. ICES (2008) reports a decline in absolute harbour seal numbers in the North Sea South of 62 Degrees N of c. 8% per annum between 2003 and 2007, although small increases were observed in some sub-units including the Skagerrak. Grey seal pup production appears to be stable or slightly increasing through most of the area for the period 2003-2007. In the past, the angelshark *Squatina squatina* is likely to have been encountered as occasional bycatch in North Sea trawl fisheries, however this species is now considered to be extinct within the North Sea (IUCN, 2010) and is no longer captured in any gears. There are no records of incidental capture of Basking shark in mobile demersal gears in the North Sea or Skagerrak and it is considered most unlikely that this species is ever captured.

Spurdog and skate scoring elements meet with SG80. Capture of marine mammals, angelshark and Basking shark in this fishery are not a significant issue and are scored at or above 80.

Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.

Indirect effects of the fishery such as habitat destruction, destruction of egg cases or competition for forage species effects have been considered 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. Spurdog is

known to predominantly feed on pelagic prey and invertebrates. Skate also have a wide ranging diet including other rays and numerous species of demersal fish.

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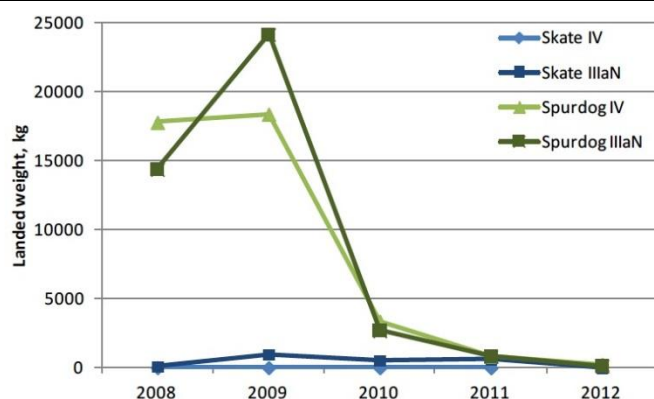
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2.3	Endangered, Threatened and Protected (ETP) species Danish seine
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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.1	Status The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species. Known direct effects are unlikely to create unacceptable impacts to ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a <u>high degree of certainty</u> that the effects of the fishery are within limits of national and international requirements for protection of ETP species. There is a <u>high degree of confidence</u> that there are <u>no significant detrimental effects (direct and indirect)</u> of the fishery on ETP species.

Score:	80
Justification: Danish seine <p>The text presented in 2.3.1 for TR2 and TR1 UoCs above covers the issues relating to ETP species and Danish seines with respect to definitions of ETP species and spurdog, common skate, Harbour seal, Grey seal and Harbour porpoise populations and their possible encounters with mobile gears.</p> <p><i>The effects of the fishery are known and are <u>highly likely</u> to be within limits of national and international requirements for protection of ETP species.</i> Whilst none of these species was recorded in data provided by the client for 2012, landings data for 2009 reveals that less than two t of spurdog were landed by Danish fishing vessels from the North Sea and Skagerrak using Danish seine gears, and less than 250kg of <i>all</i> skates and rays were landed by Danish seine vessels fishing in the North Sea and Skagerrak in 2009. Analysis of discard data for the same year reveals that some no spurdog were discarded and while some 500kg of common skate were discarded in the Danish seine fishery.</p> <p>Capture of marine mammals, angelshark and Basking shark in this fishery are not believed to be a significant issue in the Danish seine fishery as the gear is not towed for any appreciable period and mammals are likely to have opportunities to escape from the gear.</p> <p><i>Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species.</i></p> <p>Examination of DTU Aqua landings data reveals that volumes of spurdog and common skate landed from Danish seine gears in the past (prior to legislation prohibiting their landing) have been negligible. Discussions with the Danish Fisheries Ministry during the site visit confirmed that new EU regulations (43 of 2010, 57 of 2011) have been / are being implemented appropriately for Danish vessels. There are no directed fisheries for these species any longer and bycatch rates for this gear type are extremely low, as verified from landings and discard data analysis. Both spurdog and common skate are returned to the water as required by vessels in this fishery. Accordingly, the impact of the fishery on these species has been all but eliminated and occurs only through mortality of species that are returned alive.</p> <p>The graphic below indicates the dramatic reduction (elimination in practical terms) of spurdog and skate landings by DFPO vessels (all gear types) since 2010. Data are supplied by DFO using national landings database.</p>	



Due to the nature of the gear and the manner in which it is fished, survival of returned specimens is also likely to be good. It is considered highly unlikely that the direct effect of the fishery will have unacceptable impacts on these species, based on a review and consideration of recently published scientific findings. A number of studies (Mandela and Farrington 2007a&b, Revill et al. 2005, Rulifson 2007, Enever et al 2009, Enever et al 2010) point to greater survival of released specimens of spurdog and common skate from mobile demersal gears with larger mesh sizes due to associated lower rates of physical injury suffered during the capture process. Increased injury rates are associated with higher bulk catches it is suggested. Danish seine fishing is known to result in significantly reduced unwanted catch levels and hence results in smaller bulk catches. In consequence it is considered that the survival prospects for released specimens of spurdog and common skate are better than for other mobile gear types. This effect is likely to be even more pronounced for that element of the Danish seine fishery that uses mesh sizes of 130mm or more (such as all vessels that fish in the Norwegian economic zone).

Capture of marine mammals in Danish seines is known to be a very rare event and information from the fishery suggests that numbers killed or injured in this way are minimal (almost non-existent) are highly unlikely to create unacceptable impacts to Harbour seal, Grey seal or Harbour porpoise populations in the North Sea or Skagerrak.

Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.

Indirect effects of the fishery such as habitat destruction, destruction of egg cases or competition for forage species effects have been considered 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. A score of 80 is awarded

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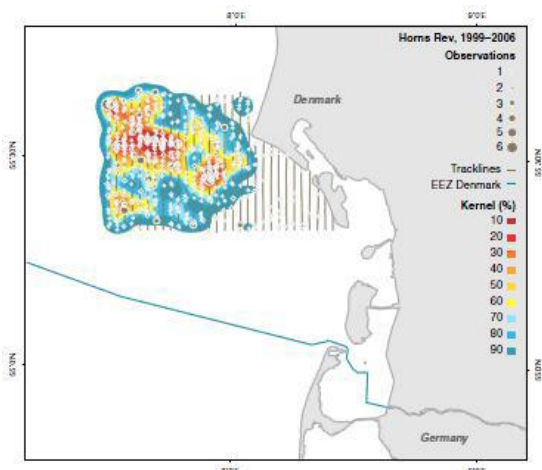
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2.3	Endangered, Threatened and Protected (ETP) species Set nets
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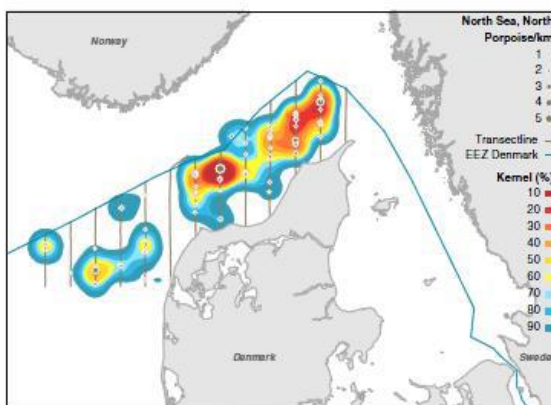
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.1	Status The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species. Known direct effects are unlikely to create unacceptable impacts to ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	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. There is a high degree of confidence that there are no significant detrimental effects (direct and indirect) of the fishery on ETP species.

Score:	75
Justification Set nets	
<p>Setnet fisheries are known to feature bycatch of marine mammals from time to time – both cetaceans and pinnipeds along with other species including basking shark, spurdog, porbeagle and occasionally common skate may be captured.</p> <p><i>Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.</i> Available evidence suggests that the Harbour porpoise is the ETP species most frequently encountered in Danish North Sea setnet fisheries (Vinther, 1999; Vinther & Larsen, 2004). A pilot video surveillance programme conducted on a 14 meter Danish gillnetter operating in the Skagerrak found that bycatch included three Harbour porpoise and one Harbour seal during 119 fishing days between September 1st 2008 and July 31st, 2009 (Kindt-Larsen & Dalskov, 2010). Vinther & Larsen (2004) suggest mean annual bycatch of Harbour porpoise may have been in the region of 5,500 animals per annum in Danish North Sea setnet fisheries between 1987 and 2001. The hake setnet fishery accounted for an estimated average annual incidental capture of between 250 and 500 Harbour porpoise in the period, or between approximately 5 and 10% of the total incidental take of porpoise by Danish setnet vessels. In 2008, the National Institute for Environmental Research reported on the findings of research into high density areas for Harbour porpoise in Danish waters, including the North Sea. Using data from this study, Map 1 below shows an area of relative high density off the south Jutland coast, close to the German border, while Map 2 shows high density areas of Harbour porpoise in the northern North Sea and Skagerrak.</p>	

Map 1 – Kernel density plot, Harbour porpoise, Jutland Sea and Skagerrak



Map 2 – Kernel density plot, Harbour porpoise northern North Sea and Skagerrak



Source: NERI Technical Report 657, 2008 University of Aarhus

The fishery clearly interacts with North Sea Harbour porpoise populations and there is a confirmed bycatch.

It has also been demonstrated that there is a bycatch of seals in this fishery. Seal entanglement in setnets has been reported in a Swedish study. Based on a survey of 16 % of all Swedish commercial fishermen, it was estimated that about 450 grey seals were by-caught in the Swedish commercial fisheries in the Northern Baltic in the year 2001. In the Gulf of Bothnia, about 50 ringed seals were bycaught, while more than 400 harbour seals were by-caught off the west coast of Sweden (Lunneryd et al. 2004). Furthermore research indicates that the fisheries for cod and flatfish with bottom-set nets are the fisheries where most seals get entangled, and the species most affected is the grey seal (Königson, 2007). The study concludes that current levels of seal by-catch cannot be considered a serious threat to the Swedish seal populations as all three seal species have demonstrated strong population growth in recent years. North Sea populations of both Harbour and Common seal have remained relatively stable in recent years, exhibiting some shift in population distribution for Common seals and an increase in pup moult counts for Grey seals. There is no evidence to show that current seal bycatch levels in setnet fisheries are unsustainable or that they are having a negative impact on seal populations.

An analysis of Danish landings data for 2009 confirms that some 6 t of spurdog were landed from Danish setnet fisheries in that year. In 2010, EU legislation restricting landings of spurdog from EU waters to 10% of the previous year's quota for this species came into effect (Council Regulation 23/2010), while no landings from EU waters were permitted from 2011 onwards (Council Regulation 57/2011). Discussions with the Danish Fisheries Ministry during the site visit confirmed that the regulation is being implemented appropriately for Danish vessels and no Spurdog captured in EU waters is landed any longer. Similarly, all landings of common skate have been prohibited although 2009 landings data reveal insignificant catches of skates and rays from setnets by Danish vessels suggesting that the species is not frequently captured in setnets that are designed to catch whitefish species.

The assessment team also considered that the known direct effects of the fishery are unlikely to create unacceptable impacts to ETP species.

In 2008, ICES was asked to evaluate the bycatch of harbour porpoises in the North Sea against the Ecological Quality Objective used by OSPAR, which states that bycatch should be kept below 1.7% of the best population estimate. ICES referred to the findings of the SCANS II project for an abundance estimate (239,061 animals in the North Sea), but were unable to provide a complete bycatch estimate, nor state whether bycatch was below the 1.7% objective. In consequence, it has not been possible to state whether the fishery is meeting international requirements for the protection of Harbour porpoise in the North Sea.

Harbour porpoise populations for the northern North Sea and Southern and Central North Sea were estimated to be in the region of 48,000 and 152,000 respectively in 2008 (Hammond and McLeod, 2006). According to the Danish Plan for the conservation of Harbour porpoise (Anon., 2005), the total by-catch of harbour porpoises for all fisheries taking place in the North Sea is considered unsustainable however and the present fishery clearly contributes incrementally to this. Vinther and Larsen (2004) suggest that the directed bottom set gillnet fishery for hake in the North Sea and Skagerrak has an annual bycatch of Harbour porpoise of between 285 and 501 animals, depending on which method of calculation is used. The figures indicated are for the period 1997-2001. The current Harbour porpoise

bycatch rates indicated for this fishery is highly likely to be much lower than this and therefore within the bycatch limit set for porpoise, given that recent trends in the industry have seen contraction, decommissioning and a large reduction in effort.

Direct effects of the fishery on spurdog, common skate and seals are known and are unlikely to create unacceptable impacts. Survival of both spurdog and common skate are unlikely to be high due to likely physical damage from becoming enmeshed, however it is considered that since no directed fisheries (which used to target aggregations of pregnant females) for spurdog take place any longer the actual impact of the fishery on this species is likely to be minimal and limited to occasional bycatches of individuals which must then be returned to the sea as soon as possible. There is good information available from recent scientific study that suggests survival times of released elasmobranchs, including skate and spurdog, can be reasonably high (albeit mainly for trawl caught specimens).

Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts. The effects of removal of demersal fish species by the fishery is unlikely to pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species. While the levels of bycatch within this fishery are considered likely to be within limits of international and national requirements, the assessment team have been unable to confirm that bycatch levels are highly likely to be within such limits. The assessed score for this PI therefore is 75.

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2.3	Endangered, Threatened and Protected (ETP) species Long line
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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.1	Status The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species. Known direct effects are unlikely to create unacceptable impacts to ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a <u>high degree of certainty</u> that the effects of the fishery are within limits of national and international requirements for protection of ETP species. There is a <u>high degree of confidence</u> that there are <u>no significant detrimental effects (direct and indirect)</u> of the fishery on ETP species.

Score:	80
Justification: Long line	
<p><i>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 (this includes both direct and indirect effects).</i></p> <p>In general terms, relatively little research effort has been focused on interactions between demersal longline fisheries and ETP species (excluding birds). In the context of bird bycatch (the most likely/prevalent interaction with this fishery), birds are considered under the By catch Performance Indicator of this assessment. The majority of ETP bycatch research work and management effort focuses on interactions with other fisheries – e.g. marine mammal bycatch in set net fisheries, bycatch of elasmobranchs in mobile gear fisheries, etc. At EU level, and from the point of view of the work of ICES (which provides scientific advice to EU fishery managers), the main focus of WGMME and SGBYC is on ETP interactions with fishing gears other than longlines, with little or no mention of ETP interactions with demersal longline fisheries. This focus on other fishery interactions is explained by an informed understanding amongst fishermen, scientists, NGO's and managers of the risks to ETP species associated with the spatial and temporal use of particular gear types or fishing methods. The fact that there is relatively little research effort focused on ETP interactions of demersal longline gears in the North Sea and Skagerrak indicates that this gear type and fishing method is highly selective and poses little or no appreciable risk to ETP species. There are a number of reasons for this. The gear is passive, so entrapment is unlikely; the gear is demersal and set relatively low on the seabed, so the chance of entanglement are reduced; while its encounterability is largely restricted to demersal species (other than for at times of deployment and retrieval). Additionally, the gear is used in relatively deep waters, deeper than typical dive depths of many ETP species, and the hooks and line strength are selected to suit the target cod and hake, and would break if taken by something significantly larger.</p> <p><i>Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species.</i> However, it cannot be stated that there is no interaction of any description with ETP. Data provided for the relatively small and new longline fleet that are the subject of this assessment reveals that there are regular captures of individual spurdog and seabirds. Spurdog are not landed and captured individuals are released back into the sea alive, although the survival rate is uncertain and depends to an extent on physical injury associated with the de-hooking process for individual specimens. There is also evidence of regular but low level capture of seabirds (considered under Bycatch PI).</p> <p><i>Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.</i></p> <p>The indirect effects are believed to be minimal due to the selectivity of the gear type, its limited use and the target species status.</p>	

Due to a lack of accurate catch and discard data or observer data for a reasonable time series for this fleet, it has not been possible to consider that *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 (SG100)*. All scoring elements at SG80 have been met and a score of 80 is assessed.

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Demersal Trawl TR2, TR1 Danish seine				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.2	Management strategy The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none">- meet national and international requirements;- ensure the fishery does not pose a risk of serious or irreversible harm to ETP species;- ensure the fishery does not hinder recovery of ETP species; and- minimise mortality of ETP species.	There are measures in place that minimise mortality, 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 that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a <u>comprehensive strategy</u> in place for managing the fishery's impact on ETP species, including measures to minimise mortality that is designed to achieve above national and international requirements for the protection of ETP species.
		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 some information directly about the fishery and/or the species involved. There is <u>evidence</u> that the strategy is being implemented successfully.	The strategy is mainly based on information directly about the fishery and/or species involved, and a <u>quantitative analysis</u> supports <u>high confidence</u> that the strategy will work. There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is evidence that the strategy is achieving its objective.
TR2 75 TR1 75 Score: Danish seine 75 Set nets 75				
Justification				
<p>There is a <u>strategy</u> in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>The fishery has a cohesive and strategic arrangement made up of several measures that are designed to manage impacts of the fisheries on ETP species specifically. There is a reasonable understanding of how the strategy will work to achieve the outcome 80 of 2.3.1.</p> <p>A combination of regulatory protection of ETP species together with improved reporting and voluntary initiatives that have been implemented within the fishery with a view to minimising impacts on ETP species have been evaluated in the context of providing protection to ETP species. The assessment team are of the opinion that the three components constitute a strategy to manage ETP species. Furthermore, the team believe the strategy contains mechanisms for the modification of fishing practices in light of the identification of unacceptable impacts.</p> <p>Measures to manage ETP that are considered fundamental to the strategy include:</p> <p><i>Regulatory measures:</i></p> <p>i) Annual EU fishing opportunities regulations. For 2011 this is Council Regulation 57 of 2011. The regulation effectively prevents directed fishing for ETP species by prohibiting the landing, retaining on board or transshipment of Basking shark (all waters), angelshark (all EU waters) and common skate (EU waters of ICES division IIa and ICES subareas III, IV, VI, VII, VIII, IX and X) by EU registered fishing vessels and which prohibits the retaining onboard of spurdog</p>				

captured within EU waters. The implication of this is that all common skate, spurdog and angelshark captured in EU water may not be retained on board and must be promptly released unharmed to the extent practicable. Under the regulation, fishers shall be encouraged to develop and use techniques and equipment to facilitate the rapid and safe release of the species. ii) Fisheries control measures include the licensing of fishing vessels, Individual Transferable Quotas, species TAC's and national quotas, effort limitations as well as technical control measures/EU fishing effort controls that set out limits for fishing effort by mobile gears according to mesh size used (TR1, TR2)

iii) Outside of the EU zone, since 2007, Norway has operated a general ban on fishing for and landing of spurdog in the Norwegian economic zone and in international waters, although by-catch must be landed.

iv) Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, otherwise known as the 'Habitats Directive'. Article 11 of the Habitats Directive requires that "*Member States shall undertake surveillance of the conservation status of the natural habitats and species referred to in Article 2 with particular regard to priority natural habitat types and priority species.*" This includes all species of cetacean and pinniped occurring in European waters. Additionally, Article 12 also requires that "*Member States shall establish a system to monitor the incidental capture and killing of the animal species listed in Annex IV (a) [which includes all cetaceans]. In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.*"

v) Council Regulation (EC) No 812/2004 laying down measures concerning incidental catches of cetaceans in fisheries. The regulation specifies a number of measures that must be taken within fisheries that are known to feature potentially significant cetacean bycatch. Although the present fishery is not subject to prescribed at sea monitoring undertakings under the regulation, it is considered that this regulation forms an important part of EU strategy to manage impacts of fishing on certain ETP species and it is thus considered part of the overall strategy.

vi) Council regulation 812/ 2004 acoustic deterrents must be used in ICES IV and IIIa for the following fisheries:

- Any bottom-set gillnet or entangling net, or combination of these nets, the total length of which does not exceed 400m during the period 1 August to 31st October and
- Any bottom-set gillnet or entangling net with mesh sizes \geq 220m throughout the year.

The first point requires that acoustic deterrents be used in areas IV and IIIa for setnets that are less than 400m in length and which are therefore most likely to be used over wrecks in the autumn cod fishery. It is noted that cod make up 33% of the catch volume in the North Sea for Danish set net vessels landing hake (6%) and therefore this measure in place for cod is likely to be relevant to a limited extent for hake. The pinger usage requirement however does not apply in the main to the present fishery and it does not form a significant element of the strategy to manage ETP impacts.

Council Regulation (EC) No 812/2004 also specifies other measures that must be taken within fisheries that are known to feature potentially significant cetacean bycatch. Although the present fishery is not subject to prescribed at sea monitoring undertakings under the regulation, it is considered that this regulation forms an important part of EU strategy to manage impacts of fishing on certain ETP species and it is thus considered part of the overall strategy.

vi) Commission Regulation (EC) No 356/2005 laying down detailed rules for the marking and identification of passive fishing gear.

Voluntary measures (as a condition of MSC accreditation):

Code of Conduct – all DFPO vessels that land fish under this certificate will have in place and operational a Code of Conduct which gives clear guidance to fishing crews on how ETP species need to be managed in order to achieve retain MSC certification. Details of the CoC, the conditions relating to its implementation, penalties for non compliance and a current list of DFPO member vessels that have signed up to the COC (and which are therefore eligible to land fish under this certificate) is maintained by the DFPO at <http://www.danish-msc-fisheries.dk>.

Further detail and information in relation to the voluntary undertakings (a condition of certification) including a copy of the wheelhouse guide and the ETP reporting form, is given in Appendix 1. The scoring of this PI at SG80 is dependent on compliance by all vessels with the requirement to record all catches of marine mammals, spurdog, skate and ray by species. It is also based on collation of ETP logbook data by the Producer Organisation. Ongoing compliance will be verified during annual surveillance audits.

Other supporting measures

Measures already adopted in EU waters are likely to be further supplemented by management measures proposed under the Community Action Plan for the Conservation and Management of Sharks (CPOA, EU COM(2009) 40 final), adopted in 2009. The CPOA sets out to rebuild depleted shark (and skate and ray) stocks fished by EU vessels both within and outside EU, and the Shark Assessment Report that accompanies the CPOA pays particular attention to spurdog. Measures outlined in the CPOA include the establishment of catch limits for shark stocks in conformity with advice provided by ICES, promoting the release of live by-catch, improving the selectivity of fishing gears, establishment of by-catch reduction programmes for Critically Endangered and Endangered shark species, and international cooperation in Convention on Migratory Species and CITES with a view to controlling directed shark fishing and trading.

There is an objective basis for confidence that the strategy will work, based on some information directly about the fishery and/or the species involved.

Knowledge in relation to cetacean and pinniped bycatch rates and population status of potentially affected species is adequate to form an objective basis for confidence that the management strategy will work with respect to these species. Information in relation to North Sea Harbour porpoise populations as well as Harbour seal and Grey seal populations suggests that none are declining or threatened. ASCOBANS (2004) reports that Swedish estimates for Harbour porpoise mortality through bycatch in demersal bottom trawls in the Skagerrak number approximately 20 animals per year, while Lunneryd *et al* (2004) report on likely low levels of seal bycatch in Swedish bottom trawl fisheries in the Baltic Sea.

The major source of spurdog fishing mortality has resulted from targeted fishing of pregnant females, which tend to aggregate in particular areas. While there are no remaining directed spurdog fisheries in EU waters, fishing mortality through capture as bycatch is likely to continue, albeit at a very much reduced rate as captured individuals can no longer be landed from EU waters. A number of published studies suggest that post capture survival rates for small sharks that are released are reasonably high (Mandelman and Farrington 2007a&b, Revill *et al.* 2005, Rulifson 2007). A critical factor in determining the likely survival rate is the weight of the codend at time of hauling which is related to the bulk of the catch. Higher bulk catches appear to be associated with lower survival rates.

Enever *et al* 2009 report on survival of trawl caught skate species (Rajidae) in the Bristol Channel. Results suggest that the survival rate is related to the bulk of the codend which tends to determine the health status of skate brought aboard. Observed 72hr mortality rates ranged from 21% for fish in least good condition to 95% for the healthiest appearing fish. The proportion in poor condition on capture was positively correlated with estimated codend weight, so technical modifications to fishing gear aimed at reducing unwanted by-catch would increase the survival of discarded skates. Enever *et al* (2010) report on findings in relation to the effects of discard mitigation on the survival of skate in the Bristol Channel. Results indicate that greater survival of released skate is likely where bulk catches are minimised through the use of more selective gears (Inc 100mm diamond mesh and square mesh). Lowest survival rates were observed for 80mm diamond 'control' gears. Overall the research shows that survival of common skate and spurdog can be reasonably good where injury related to the capture process is minimised.

In the present TR2 trawl fishery, the minimum legal mesh size permitted is 80mm although most vessels use 90mm meaning that survival rates for released specimens are likely to be higher than has been observed in 80mm gears in scientific studies. Furthermore, the smaller scale of the TR2 fishery (compared to the TR1 gear type) and the limited spatial distribution of the fishery means that there is an objective basis for confidence that the management strategy will work.

In the TR1 and Danish seine fisheries, the minimum size used in EU waters is 110mm. In practice however, the majority of vessels also fish within the Norwegian economic zone, where the minimum permitted mesh size is 120mm and where discarding is also not permitted. For reasons of practicality and in order to minimise the risk of breaching Norwegian regulations, vessels that fish in Norwegian waters even occasionally tend not to change their gear from 130mm to 110mm codend mesh size when fishing in EU waters. In light of this and considering the published research referred to, the likely outcome in the context of spurdog and common skate bycatch in this fishery is that survival rates are likely to be high for specimens that are released immediately on capture, as bulk and unwanted catch volumes are low, resulting in less injury to spurdog and skate specimens.

It has not been possible to state that there is sufficient evidence that the strategy is being implemented successfully in order to achieve the last scoring issue (c) at SG80. The principal outstanding issue with respect to supporting evidence of implementation is the fact that the ETP species wheelhouse identification guide had not been finalised and printed in hardcopy so as to be available onboard vessels by the time of the information review. A score of 75 is assessed for TR1/TR2/Danish seine and setnet UoCs.

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- » 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.
- » Rulifson, R.A. 2007. Spiny Dogfish Mortality Induced by Gill-Net and Trawl Capture and Tag and Release North American Journal of Fisheries Management 27:279–285.

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.2	Management strategy The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none">- meet national and international requirements;- ensure the fishery does not pose a risk of serious or irreversible harm to ETP species;- ensure the fishery does not hinder recovery of ETP species; and- minimise mortality of ETP species.	<p>There are measures in place that minimise mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>There is an objective basis for confidence that the strategy will work, based on some information directly about the fishery and/or the species involved.</p> <p>There is evidence that the strategy is being implemented successfully.</p>	<p>There is a <u>comprehensive strategy</u> in place for managing the fishery's impact on ETP species, including measures to minimise mortality that is designed to achieve <u>above</u> national and international requirements for the protection of ETP species.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and a <u>quantitative analysis</u> supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is evidence that the strategy is achieving its objective.</p>
Score: Longline 80				
Justification				
<p>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. The fishery has a cohesive and strategic arrangement made up of several measures that are designed to manage impacts of commercial fisheries on ETP species specifically. There is a reasonable understanding of how the strategy works to achieve the outcome 80 of 2.3.1.</p> <p>A combination of regulatory protection of ETP species together with improved reporting and voluntary initiatives that have been implemented within the fishery with a view to minimising impacts on ETP species have been evaluated in the context of providing protection to ETP species. The assessment team are of the opinion that the three components constitute a strategy to manage ETP. Furthermore, the team believe the strategy contains mechanisms for the modification of fishing practices in light of the identification of unacceptable impacts.</p> <p>Measures to manage ETP that are considered fundamental to the strategy include:</p> <p>Regulatory measures:</p> <p>i) Annual EU fishing opportunities regulations. For 2011 this is Council Regulation 57 of 2011. The regulation effectively prevents directed fishing for ETP species by prohibiting the landing, retaining on board or transshipment of angelshark (all EU waters) and Common skate (EU waters of ICES division IIa and ICES subareas III, IV, VI, VII, VIII, IX and X) by EU registered fishing vessels and which prohibits the retaining onboard of spurdog captured within EU waters. The implication of this is that all common skate, spurdog and angelshark captured in EU waters may not be retained on board and must be promptly released unharmed to the extent practicable. Under the regulation, fishers shall be encouraged to develop and use techniques and equipment to facilitate the rapid and safe release of the species.</p> <p>ii) Fisheries control measures include the licensing of fishing vessels, Individual Transferable Quotas, species TAC's and national quotas, effort limitations as well as technical control measures/EU fishing effort controls</p> <p>iii) Outside of the EU zone, since 2007, Norway has operated a general ban on fishing and landing of Spurdog in the Norwegian economic zone and in international waters, although by-catch must be landed.</p> <p>iv) Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, otherwise known as the 'Habitats Directive'. Article 11 of the Habitats Directive requires that "Member States shall undertake surveillance</p>				

of the conservation status of the natural habitats and species referred to in Article 2 with particular regard to priority natural habitat types and priority species." This includes all species of cetacean and pinniped occurring in European waters.

Voluntary measures (as a condition of MSC accreditation):

Code of Conduct – all DFPO vessels that land fish under this certificate have in place and operational a Code of Conduct which gives clear guidance to fishing crews on how ETP species need to be managed in order to achieve retain MSC certification. Details of the CoC, the conditions relating to its implementation, penalties for non-compliance and a current list of DFPO member vessels that have signed up to the COC (and which are therefore eligible to land fish under this certificate) is maintained by the DFPO at <http://www.danish-msc-fisheries.dk>.

Further detail and information in relation to the voluntary undertakings (a condition of certification) including a copy of the wheelhouse guide and the ETP reporting form, is given in Appendix 1. The scoring of this PI at SG80 is dependent on compliance by all vessels with the requirement to record all catches spurdog, skate and ray by species. It is also based on collation of ETP logbook data by the Producer Organisation. Compliance will be checked during annual surveillance audits.

Other supporting measures

Measures already adopted in EU waters are likely to be further supplemented by management measures proposed under the Community Action Plan for the Conservation and Management of Sharks (CPOA, EU COM(2009) 40 final), adopted in 2009. The CPOA sets out to rebuild depleted shark stocks fished by EU vessels both within and outside EU, and the Shark Assessment Report that accompanies the CPOA pays particular attention to Spurdog. Measures outlined in the CPOA include the establishment of catch limits for shark stocks in conformity with advice provided by ICES, promoting the release of live by-catch, improving the selectivity of fishing gears, establishment of by-catch reduction programmes for Critically Endangered and Endangered shark species, and international cooperation in Convention on Migratory Species and CITES with a view to controlling directed shark fishing and trading.

There is an objective basis for confidence that the strategy will work, based on some information directly about the fishery and/or the species involved.

The range of ETP species that may be encountered or interact with demersal longline gear is limited to small sharks, common skate and birds. Anything larger such as seals and/harbour porpoise are highly likely to escape by breaking longline dropper hook lines away from the main line in the event that bait is consumed. Concerning birds it is obvious that fishermen will try prevent bycatches since it results in an inefficient fishery when birds take bait. Since the reported bycatches of birds are rather low there is an objective basis for confidence that bycatches are reduced to a minimal level. There is evidence that the strategy is being implemented successfully.

Compliance within the Danish commercial catching sector is reported to be high. The voluntary Code of Conduct has been implemented onboard the relevant vessels and data in relation to ETP bycatch is recorded and will be available to future surveillance audits.

References

- » EU Council regulation 812/ 2004
- » Commission Regulation (EC) No 356/2005
- » Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora
- » Northridge, S.P., 1984 World review of interactions between marine mammals and fisheries. FAO Fish. Pap., (251):190 p.

Demersal Trawl TR2 (70mm≤mesh size≤100mm)				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.3	Information monitoring Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> - 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. 	<p>Information is adequate to broadly understand the impact of the fishery on ETP species.</p> <p>Information is adequate to support measures to manage the impacts on ETP species</p> <p>Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.</p>	<p>Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts.</p> <p>Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.</p>	<p>Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.</p> <p>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.</p> <p>Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.</p>

Score: TR2 70 TR1 70 Danish seine 70	
Justification TR2 and TR1 and Danish Seine	
<p>Information is <u>sufficient</u> to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a <u>full strategy</u> to manage impacts (SG80).</p> <p>Information is available on capture rates for spurdog in the demersal trawl fishery using TR2 and TR1 gears and for Danish seines. The data are not as certain for common skate as identification of landings is likely to have been both inadequate and inaccurate in the past prior to regulations requiring identification of rays and skates to species level. Although landings of these species are now in the main prohibited, previous landings data along with data from discard monitoring programmes (ongoing) are considered adequate to support ongoing monitoring of the fishery's impacts on these species as well as measuring trends while also effectively supporting the strategy to manage impacts. Additionally under the Code of Conduct that this fishery operates, greater levels of data in relation to catches of spurdog and skates are being recorded since 2010 and data from these are available to measure trends and to further support a full strategy to manage impacts on ETP species.</p> <p>Information is adequate to support <u>measures</u> to manage the impacts on ETP species. There is good information in relation to landings and rates of capture in relation to ETP species through a range of data sources as well as scientific literature for North Sea fisheries interactions with ETP species. Additional information is available in relation to scale of each UoC, spatial and temporal operation of fisheries and general understanding of the status of populations that are impacted. The level of information available supports scoring at SG60.</p> <p><u>Information</u> is sufficient to <u>qualitatively</u> estimate the fishery related mortality of ETP species (SG60).</p> <p>The range of ETP species that may be captured within the fishery is known from an examination of landings and discard data specific to the fishery as well as from a review of scientific literature including the past and most recent reports of the ICES Working Group on Marine Mammal Ecology (WGMME) and the Study Group on the Bycatch of Protected Species (SGBYC). The list of ETP species encountered in this fishery has been verified during discussions with DTU Aqua at the time of the site visit.</p>	

The scoring guide at SG 80 requires that *Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species*. The level of data that has been available to the assessment team at the time of the assessment has not been adequate to quantitatively estimate the fishery related mortality of all ETP species. In particular this relates to marine mammal bycatch for which there has been very little data available but also for common skate. It is expected that the additional data will be generated from within the fishery in the coming years through effective implementation of the Code of Conduct and that this will permit movement towards best practice (SG80) within two to three years. The assessment team understand that some data on ETP interactions by different UoCs has already become available through the operation of the voluntary logbook recording scheme, as per the requirements of the DFPO haddock, plaice, saithe and sole certifications (aspects of which the fishery under assessment must harmonise with). Availability of data supports the closing of this condition for the haddock certification however there are additional milestones which need to be met at the second annual surveillance audit (due in 2014) before the condition can be closed out and the score raised to 80. Accordingly, while it is acknowledged that data in relation to ETP interactions is now becoming available through the voluntary reporting scheme, scoring has been harmonised with the haddock assessment. This requires that the same condition will need to be applied on this fishery under 2.3.3 until such time as all annual milestones are considered to have been met.

References

- » ASCOBANS 2009. Conservation Plan for Harbour Porpoises (*Phocoena phocoena* L.) in the North Sea. MOP6/Doc.7-02 (AC)
- » OSPAR 2010. Background Document for Common skate *Dipturus batis*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf
- » OSPAR 2010. Background Document for Spiny dogfish *Squalus acanthias*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf

Set nets				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.3	Information monitoring Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> - 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. 	<p>Information is adequate to broadly understand the impact of the fishery on ETP species.</p> <p>Information is adequate to support measures to manage the impacts on ETP species</p> <p>Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.</p>	<p>Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts.</p> <p>Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.</p>	<p>Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a high degree of certainty.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.</p> <p><u>Accurate and verifiable information</u> is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.</p>

Score:	70 set nets
Justification set nets	
<p>Information is <u>sufficient</u> to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a <u>full strategy</u> to manage impacts (SG80).</p> <p>Information is available on spurdog landings in the setnet fishery by Danish vessels up until 2012. Information is also available on landings of skate for this gear type. Despite the fact that the data for common skate are likely to be inadequate as landings are not accurately identified to species level, the observed overall catch levels for skate are low and indicate that the fishery is very unlikely to present a significant threat to common skate. For spurdog, there has been no directed fishery for this species for a number of years and setnet landings up until 2012 indicate the likely level of bycatch of spurdog in other setnet fisheries. This data is useful in determining the level of threat that the setnet fishery presents. Additional data will be available within a short period from the ETP log that is maintained by Danish vessels that fall within the scope of this certificate and this will be useful for monitoring trends in catches of spurdog and skate as well as Harbour porpoise and seals. Scientific literature (Vinther & Larsen, 2004) points to a sustainable level of bycatch of harbour porpoise in the hake setnet fishery. Seal populations are known to be stable or increasing throughout the Skagerrak and North Sea. Although there are indications of shifts in densities between haul out or pupping sites overall population status for both species is reported to be stable. Seal population status is monitored by several nations with an interest in the North Sea and is reported on through the ICES Working Group on Marine Mammal Ecology (WGMME), while the effects of bycatch on populations is reported on through the ICES Study Group on Bycatch of Protected Species (SGBYC).</p> <p>Information is adequate to support <u>measures</u> to manage the impacts on ETP species. There is good information in relation to landings and rates of capture in relation to ETP species through a range of data sources as well as scientific literature for North Sea fisheries interactions with ETP species. Additional information is available in relation to scale of each UoC, spatial and temporal operation of fisheries and general understanding of the status of populations that are impacted. The level of information available supports scoring at SG60.</p> <p><u>Information</u> is sufficient to <u>qualitatively</u> estimate the fishery related mortality of ETP species (SG60).</p> <p>The range of ETP species that may be captured within the fishery is known from an examination of landings data specific to the fishery as well as from a review of scientific literature including the past and most recent reports of the ICES</p>	

Working Group on Marine Mammal Ecology (WGMME) and the Study Group on the Bycatch of Protected Species (SGBYC). The list of ETP species encountered in this fishery has been verified during discussions with DTU Aqua at the time of the site visit.

The scoring guide at SG 80 requires that *Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species*. The level of data that has been available to the assessment team at the time of the assessment has not been adequate to quantitatively estimate the fishery related mortality of all affected ETP species. In particular this relates to harbour porpoise and seal bycatch, for which there has been very little recent data available. It is expected that the additional data will be generated from within the fishery in the coming years through effective implementation of the Code of Conduct and that this will permit movement towards best practice (SG80) within two years.

The assessment team understand that some data on ETP interactions by different UoCs has already become available through the operation of the voluntary logbook recording scheme, as per the requirements of the DFPO haddock, plaice, saithe and sole certifications (aspects of which the fishery under assessment must harmonise with). Availability of data supports the closing of this condition for the haddock certification however there are additional milestones which need to be met at the second annual surveillance audit (due in 2014) before the condition can be closed out and the score raised to 80. Accordingly, while it is acknowledged that data in relation to ETP interactions is now becoming available through the voluntary reporting scheme, scoring has been harmonised with the haddock assessment. This requires that the same condition will need to be applied on this fishery under 2.3.3 until such time as all annual milestones are considered to have been met.

A single scoring element at SG80 has been met along with all elements at SG60. A score of 70 is assessed.

References

- » OSPAR 2010. Background Document for Common skate *Dipturus batis*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf
- » OSPAR 2010. Background Document for Spiny dogfish *Squalus acanthias*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf
- » ASCOBANS 2009. Conservation Plan for Harbour Porpoises (*Phocoena phocoena* L.) in the North Sea. MOP6/Doc.7-02 (AC)
- » Vinther, M. & Larsen, F. (2004). Updated estimates of harbour porpoise bycatch in the Danish North Sea bottom set gillnet fishery. *J. CETACEAN RES. MANAGE.* 6(1):19–24, 2004
- » Dalskov J. and Kindt-Larsen L. 2009. Fully Documented Fishery. DTU Aqua report no. 204
- » Kindt-Larsen, L. and Dalskov, J. 2010. Pilot study of marine mammal bycatch by use of an Electronic Monitoring System. DTU Aqua
- » JNCC. 2002. Atlas of Cetacean distribution in north-west European waters. Compiled and edited by Reid J.B, Evans G.H. and Northridge S.P.
- » OSPAR Commission, 2008. Case Reports for the OSPAR List of threatened and/or declining species and habitats

Long line				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.3	Information monitoring Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> - 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. 	<p>Information is adequate to broadly understand the impact of the fishery on ETP species.</p> <p>Information is adequate to support measures to manage the impacts on ETP species</p> <p>Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.</p>	<p>Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts.</p> <p>Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.</p>	<p>Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a high degree of certainty.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.</p> <p><u>Accurate and verifiable information</u> is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.</p>

Score:	70 Long line	
Justification		
<p>Information is <u>sufficient</u> to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a <u>full strategy</u> to manage impacts (SG80).</p> <p>The long line fishery is relatively new and there is only a short time series of catch data available which is deemed inadequate to assess the scale of interactions with ETP species. Though it is likely that spurdog are captured incidentally from time to time, these are returned to the water and despite uncertainty about post capture survival, the potential impact is probably low due to the low incidence of capture and small size of the UoC. General information in relation to longline fisheries is also useful for inferring likely threats to ETP species in this fishery and the low level of research into ETP longline interactions indicates that the risk of this fishery to ETP species is known to be low and relates to mainly to bird bycatch.</p> <p>Information is adequate to support <u>measures</u> to manage the impacts on ETP species. There is good information in relation to landings and rates of capture in relation to ETP species through a range of data sources as well as scientific literature for North Sea fisheries interactions with ETP species. Additional information is available in relation to scale of each UoC, spatial and temporal operation of fisheries and general understanding of the status of populations that are impacted. The level of information available supports scoring at SG60.</p> <p><u>Information</u> is sufficient to <u>qualitatively</u> estimate the fishery related mortality of ETP species SG60.</p> <p>Due in part to the relatively short history of this fishery, but also as a result of the overall low level of perceived risk to ETP which means that there has been no observer coverage of the fishery to date in Denmark, sufficient data are not available to allow fishery related mortality and the impact of fishing to be <u>quantitatively</u> estimated for ETP species. Because of this the second scoring element at SG80 cannot be awarded and a score of 70 corresponds.</p>		

References

- » Northridge, S.P., 1984 World review of interactions between marine mammals and fisheries. FAO Fish. Pap. (251):190 p.
- » OSPAR 2010. Background Document for Spiny dogfish *Squalus acanthias*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf
- » ASCOBANS 2009. Conservation Plan for Harbour Porpoises (*Phocoena phocoena* L.) in the North Sea. MOP6/Doc.7-02 (AC)

Demersal Trawl TR2 and TR1				
2.4	Habitat			
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.1	Status The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is <u>highly unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

Score:	TR2 75 TR1 75	
Justification		
<p>The fishing gear used in the TR2 fishery comprises relatively robust demersal trawl gear, with heavy steel trawl doors, clump weights and rugged ground gear that may rarely include rock hopper configured ground gear. In general, the gear is designed for fishing on mud, sand, and sandy mud seabed sediments that dominate in the areas where the fishery takes place. Seabeds are relatively homogenous throughout the area or may comprise a mosaic of sediments. No extensive e areas of hard seabed are fished routinely although isolated patches of rock and stones/gravel may be encountered. Mobile trawl gears are known to impact on seabed habitat structure and function and also associated communities of epifaunal and infaunal species.</p> <p>Evaluation of outcome indicator as per FAM v2.</p> <p>The MSC defines “highly unlikely” as being no more than 30% probability. Serious or irreversible harm is also clearly defined in the MSC methodology as being “gross change in habitat types or abundances. (which would) take much longer to recover than the dynamics in an unfished situation would imply (e.g. implying some sort of regime shift e.g. loss / extinction of habitat types).</p> <p>In order to answer these questions, key considerations include:</p> <ul style="list-style-type: none"> » the type of ground that the fishery takes place on » the presence of sensitive, vulnerable habitats, in particular including slow growing, habitat-forming species (i.e. reefs) » the impact of the fishing gear on these habitats, » the likely rate of recovery if left unfished. <p>To inform this question the assessment team have referred to a range of sources, such as habitat maps, published gear impact studies, known locations of vulnerable species, spatial information on the exact fishing location of certified fleets. For further details on the information sources used see 2.4.3.</p> <p>The area of the fishery:</p> <p>ICES (2007) provides a broad description of the bottom topography of the North Sea, broadly described as having a shallow (<50 m) southeastern part. The substrates here and in adjacent coastal regions are dominated by sands. These sands become generally coarser to the east and west, interspersed with patches of gravel and stones. Local concentrations of boulders are found in the shallow most southerly part. The Dogger bank separates the southern shallow, sand-dominated habitats from a much deeper (50–100 m) central part, running north along the British coast. The central northern part of the shelf gradually slopes down to 200m before reaching the shelf edge. A main feature is the Norwegian Trench running in the east along the Norwegian coast into the Skagerrak with depths up to 500 m. Further to the east, the Norwegian Trench ends abruptly, and the Kattegat is of similar depth as the main part of the North Sea. The deeper, more central regions are characterised by fine muds, as are the deep areas of the Norwegian Trench, while some of the slopes have rocky bottoms. Several underwater canyons extend further towards the coasts of Norway and Sweden.</p>		

By comparing information from the VMS vessel plots, with the bathymetry and sediment type charts of the North Sea, corroborated by qualitative understanding from trawler skippers, it is clear that almost all fishing effort by the UoC takes place in waters less than 200m deep, on mainly muddy and sandy sediments, within the eastern North Sea including the Norwegian Trench and into the Skagerrak. While there is some variance in intensity and spatial distribution of effort between seasons, the great majority of trawling effort has been shown to be concentrated into a relatively narrow corridor that extends along the southern edge of the Norwegian Trench. At its most easterly point, the trawl fishery occurs in the Skagerrak, off the north Jutland and it extends westwards and then north eastwards to latitude 61° N.

Sensitive / vulnerable habitats:

OSPAR (www.OSPAR.org) list a number of sensitive habitats in the northeast Atlantic, including the North Sea. A series of maps which clearly show the location and distribution of sensitive habitats in the OSPAR area are available on the OSPAR website (<http://www.searchnbn.net/hosted/ospar/ospar.html>). The assessment team have carried out a review of these maps, comparing locations of known sensitive / vulnerable habitats, with the location of fishing vessel activities (from VMS). The habitats examined included *Lophelia pertusa* reefs, *Sabellaria spinulosa* reefs, deep sea sponge aggregations, carbonate mounds, horse mussel (*Modiolus modiolus*) beds, seapens and burrowing megafaunal communities.

This review showed that there was negligible overlap between the location of the fishery under assessment and known locations of sensitive or vulnerable seabed habitats and the assessment team have therefore concluded that there is no evidence that the fishery is likely to have significant impact on any of these habitats (certainly on the scale implied by serious & irreversible), considering the location of the fishery and the level of available information with regard to sensitive and /or vulnerable seabed communities and habitats.

Impact of the fishing gear

The gear used in the demersal trawl mixed fishery typically comprises a single or twin rig trawl arrangement, whereby up to two trawls are towed in parallel behind the vessel. The net is kept open by steel otter boards that may weigh up to 1,000kg each. When fishing with twin rigs, a single 'clump' weight or roller, which may weigh up to 800kg, is deployed between the two nets and serves to keep the inner wing ends of the net close to the seabed. The ground rope typically carries 100 -200 mm diameter rubber rollers, while each net has a tickler chain (typically comprising 12mm steel chain) spanning between the wing ends. Codends may have chaffing gear fitted for protection on the underside.

Trawls gears used to fish for groundfish species such as hake can reasonably expected to have an impact on benthic habitats, as the gear must establish close contact with the seabed in order to work efficiently. The greatest physical impact, however, results from contact with the seabed that is made by trawl doors as well as the centre weight or roller; as these are pulled across the seabed they leave behind them a furrow which may be detected for some time afterwards using side scan sonar (Humborstad *et al*, 2004). Jennngs *et al* (2001); Trimmer *et al* (2005) and Hiddink *et al* (2006a) all refer to the alteration of the structure and function of seabed habitats and effects on benthic communities caused by trawling. By directly or indirectly removing and flattening any relief, the seabed may, over time, lose any pre-existing natural three dimensional structure. Benthic communities of larger, slow growing and long lived species are removed and replaced by less diverse communities of smaller, short lived and fast growing species. Hiddink *et al*. (2006a) suggest that negative impacts of trawling are greatest in those areas where seabed habitats are not subject to high levels of natural disturbance. Benthic macrofauna are most affected by trawling activity; whereas burrowing and other smaller seabed infauna are less vulnerable (Bergmann and Santbrink, 2000; Dinmore *et al*, 2004). Where trawling does not cause direct mortality to species or individual specimens, indirect consequences may arise whereby fauna is damaged or injured, making it more susceptible to being preyed upon by scavenging fauna (Kaiser and Spencer, 1994; Kenchington *et al* 2006). Repeated trawling of the seabed may also modify benthic production processes.

Rate of Recovery

The rate at which the seabed may recover from trawling impacts is difficult to estimate as most areas are fished more or less continually. Nevertheless, the available research highlights key patterns which influence the overall rate of recovery. Generally, communities dominated by long-lived, slow growing and late maturing faunal species that may also be characterised by irregular recruitment and poor potential for rapid re-colonisation through asexual reproduction can be expected to be less resilient to the effects of trawling disturbance. Such communities are more typical of hard seabeds such as cobble. Callaway *et al* (2007) suggests that recovery of benthic communities from trawling over hard seabeds probably takes in the region of 5 to 10 years. These are the types of habitats discussed above (sensitive and vulnerable), which data suggests are not significantly present in the area of the fishery under assessment. Other species and habitat types will of course be faster to recover and hence less vulnerable to impacts of trawling. 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).

In conclusion

It has been possible to show that the majority of trawl effort takes place over soft and finer seabed sediments such as mud and sandy mud such as occur in the deeper water sediments of the slope of the Norwegian Trench. These sediments are considered likely to host at least some sensitive habitats (and associated communities) within the spatial range of the fishery. However, the fishery occurs over a very limited area and a relatively small portion of the slope of the Norwegian trench is likely to be affected by the fishery. Other important areas for the fishery – such as the Skagerrak

- are unlikely to host significant sensitive, vulnerable or protected habitats and species as indicated by OSPAR and a review of available predictive habitat maps available through the Mapping European Seabed Habitats portal www.searchmesh.net. A number of Natura 2000 sites are proposed for Danish waters and initial indications are that there may be some overlap with these (and other, mainly NGO proposed) conservation areas. At the time of the assessment, proposals and associated management planning were not at a sufficiently advanced stage to have a direct bearing on the Habitats outcome status indicator for the fishery. The assessment team made use of plausible argument and interpretation of likely outcome status from general studies carried in parts of the North Sea and elsewhere. In particular, due to the potentially large number of vessels in the UoC, the assessment team considers that it is appropriate to take a precautionary approach to scoring.

The assessment team have determined, on the evidence made available to it – that there is no more than a 40% probability that the fishery may result in serious or irreversible harm (defined as “gross change in habitat types or abundances) which would take much longer to recover than the dynamics in an unfished situation would imply e.g. loss / extinction of habitat types. Moreover, the available evidence does not support the conclusion that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. Until such time as this evidence is made available, the assessment team is of the view that SG80 is only partially satisfied, thus triggering a condition, requiring appropriate action by the client to more definitively demonstrate the validity of such a conclusion.

The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

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- » OSPAR – see www.ospar.org
- »

2.4	Habitat Danish seine
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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.1	Status The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	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 <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

Score:	80
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Justification

The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. Data from the Danish Vessel Monitoring System (VMS) which shows the spatial location of Danish Seine fishing effort in the fishery has been provided to the assessment team. The fishery is spatially concentrated and data show that the fishery occurs principally within the Skagerrak. The most intensive activity is on the third quarter of the year and practically all Danish seine effort occurs within the Skagerrak.

Danish seine fishing is ideally suited to fishing smaller areas of relatively flat ground where there may be occasional obstructions or large amounts of static gears that would preclude much trawling activity. The approximate location of the Dogger Bank SCI is represented by the encircled area. There is considerable overlap between the fishery and the Dogger Bank.

A broad description of the bottom topography of the North Sea is provided above. A review of information on North Sea and Skagerrak habitat distribution and fishing effort distribution suggests that the majority of Danish seine fishing for plaice and other demersal species occurs over sandy sediments in the western Skagerrak, in water depths rarely exceeding 100 m. Broad scale habitat maps for the area indicate the possible presence of small areas of gravel, stones and reef within this area – which corresponds with the understanding that the technique is well suited for application over small areas of clear seabed, amongst obstructions.

Typical Danish seine fishing gear comprises a conical net-bag with two wings and long ropes attached to it. The foot-rope of the net is typically made of lightweight 12mm steel chain or occasionally wire rope with rubber discs up to 120mm in diameter. At the end of the wings, a rubber-covered steel wire on the seafloor, and a simple rope above it, extend further outwards to a vertical iron bar with a height of about 50 cm which keeps the wing upright. From this bar, the seine ropes lead to the vessel. Seine ropes are typically 20 to 34 mm internally weighted poly-ropes (the actual diameter used varies by vessel size and power. Each rope consists of somewhere between 12 and 18 rolls of 130 fathoms each. Danish seine fishing does not require the use of heavy ground weights or trawl doors to keep the net open. The gear is hauled back to the stationary vessel and fish are herded into the patch by the closing seine ropes and the net is only moved in the final moments of the fishing operation. As the technique relies on the relatively lightweight seine ropes to herd the fish, the technique does not leave behind the heavy trawl door or clump weight marks that are associated with trawling, on the seabed. Negative impacts of Danish seine net operations are associated with the re-suspension of sand and possibly other seabed sediments by the seine ropes as they move across the seabed. The re-suspension of sediments causes fish to respond by swimming away from the plume, into the path of the net. A potential seabed impact may result from encounters of the seine ropes with objects of seabed relief, such as rocks, debris, wreckage etc. As such encounters may lead to snagging of the gear and potential delay or disruption to the fishing procedure, as well as the possibility of sustaining substantial gear damage; seine net operations are generally reserved for areas of known seabed, with minimal relief. The success of Danish seine fishing operations also depends to a significant degree on the seine ropes herding demersal species into the path of the net. This process is essential and is made difficult where there is significant seabed relief. There are few studies of the impacts of Danish seine net fishing operations on seabed habitats. Nevertheless, Danish seines are considered to be mobile gears and share some characteristics of demersal trawls in terms of net construction and dimensions. Given that Danish seines are not towed across the seabed for extended durations (see above) it is considered that the potential impact of this fishing method on seabed habitats is considerably less than that for demersal trawls. Available information on impacts of mobile gears mainly focuses on demersal trawls and beam trawls. For the latter gear types, Jennings et al (2001); Trimmer et al (2005) and Hiddink et al (2006) all refer to the alteration of the structure and function of seabed habitats and effects on benthic communities caused by mobile gears. Trawl gears tend to reduce the seabed to a flat homogenous plain, by directly or indirectly removing and flattening any relief, the seabed may lose much or its entire three dimensional

structure. Benthic communities of larger slow growing and long lived species are removed and replaced by less diverse communities of smaller, short lived and fast growing species. Hiddink *et al.* (2006) suggest that negative impacts of trawling are greatest in those areas where seabed habitats are not subject to high levels of natural disturbance. Benthic macrofauna are most affected by trawling activity; whereas burrowing and other smaller seabed infauna are less vulnerable (Bergmann and Santbrink, 2001; Dinmore et al, 2004). Callaway et al (2007) suggests that recovery of benthic communities from trawling over hard seabeds probably takes in the region of 5 to 10 years. In sandy sediments, recovery is likely to be faster since the associated communities are accustomed to higher levels of natural disturbance. Danish seining for plaice (the main retained species) is concentrated on areas of sandy seabed. These habitats are known to have a higher level of natural disturbance than most soft sediment or deepwater reef habitat. These areas are therefore unlikely to be the location for sensitive seabed habitats. Moreover, the communities associated with these habitats are much more likely to be accustomed to natural disturbance and have higher recovery rates (Kaiser et al, 1998)

OSPAR list a number of sensitive habitats in the northeast Atlantic, including the North Sea. A series of maps showing the location and distribution of sensitive habitats in the OSPAR area are available on the OSPAR web portal. The assessment team have consulted these maps in the context of potential interaction with DFPO Danish seine fisheries for ground fish species. The habitats examined included *Lophelia pertusa* deep water coral reefs, carbonate mounds, deep sea sponge aggregations and seapens and burrowing megafaunal communities. The team have concluded that there is no evidence that the fishery is likely to have significant interactions with any of these habitats, considering that the fishery takes place mainly on sandy seabed environments and in waters that are generally less than 100m deep.

The team felt that the appropriate score in light of available information fulfilled the SG80. Danish seine net fishing has clear advantages in terms of seabed impacts and is generally accepted that Danish seining presents less of a threat to seabed habitats than fishing with demersal trawls or beam trawls. This is on account of the gear configuration and the manner in which it is fished, as well as the type of habitats where this method is utilised (generally less sensitive) and the fact that the fishery is limited in scale.

The assessment team have determined, on the evidence made available to it – that there is no more than a 30% probability that the fishery may result in serious or irreversible harm (defined as “gross change in habitat types or abundances) which would take much longer to recover than the dynamics in an unfished situation would imply e.g. loss / extinction of habitat types.

The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

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- » OSPAR – see www.ospar.org

2.4	Habitat set nets
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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.1	Status The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	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 <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

Score:	90	
Justification set nets		
<p>Gill and enmeshing nets used in the fishery are static and fixed to the seabed by anchors at each end of the net. Nets generally do not move unless strong cross currents are encountered which may cause gear to be dragged. Seabed impacts associated with setnet gear are therefore restricted to the damage that dragging of anchors and weights along short distances of seabed may cause. Setnets are most commonly used to fish on rough, uneven and hard grounds or over wrecks, in order to take advantage of areas that cannot be fished using mobile bottom gears. If gear gets dragged or if nets get lost they usually become rolled up into a ball or become entangle permanently on wrecks or other seabed obstructions from where it is difficult if not impossible to retrieve them. Furthermore nets which have become detached free from one anchor are likely to become wrapped around the remaining anchorage point in a tight ball. Anecdotal evidence indicates that gear loss is infrequent and usually results from interaction with mobile gears. Clearly there is significant economic incentive to avoid losing gear and to attempt to retrieve it using a variety of available methods where it does occur.</p> <p>Set net gear has potential to impact significantly on particularly sensitive habitats such as coldwater corals and to a lesser extent communities of deep sea sponges. Available information indicates that there are no such sensitive habitats within any of the areas where setnet gear is deployed. The extent of use of the gear type is minimal and there is no apparent overlap with sensitive communities.</p> <p><i>It is therefore considered highly unlikely that the use of setnet gear reduces habitat structure and function to a point where there would be serious or irreversible harm.</i> In this context, highly unlikely is considered to be equivalent to no more than 30% probability that the true effect of the fishery is within the range where there is risk of serious or irreversible harm.</p>		
References		
» NBN Gateway. 2010. Maps showing the distribution of habitats on the Initial OSPAR List of Threatened and/or Declining Species and Habitats http://data.nbn.org.uk/hosted/ospar/ospar.html » OSPAR Commission, 2008. Case Reports for the OSPAR List of threatened and/or declining species and habitats		

2.4	Habitat long line
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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.1	Status The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is <u>unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is <u>highly unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

Score:	90	
Justification long lines		
<p>Longlines consist of a main line, sometimes of considerable length e.g. up to 750m, to which smaller lines (or snoods) with baited hooks are fixed at regular intervals e.g. every 2.5m. The main line is set either horizontally on or near the bottom. The gear is held in place by relatively small anchors that are designed to prevent gear being dragged. For a number of reasons, longline fishing activity is regarded as low impact and there is only a small chance that the gear could significantly impact upon benthic habitats. Indeed it has been suggested that shifting from trawling gear to longlines could significantly reduce habitat impacts (Jenkins and Garrison, 2009).</p> <p>There is some evidence to support the assertion that there is no more than a 20% probability that the true effects of the use of this gear type is within the range where there is a risk of serious or irreversible harm. While the impact of the fishery on seabed habitats is believed to be low, based on knowledge of the gear characteristics, fishing operations and the type of ground that the fishery mainly takes place over, there is a shortage of evidence to confirm the specific level of impact of the gear used in this fishery. Accordingly it has not been possible to meet all of SG 100 and a score of 90 is considered appropriate.</p>		
References		
<ul style="list-style-type: none"> » Jenkins, L. and Garrison, K. . Gear Conversion as a Means to Reduce Bycatch and Habitat Impacts" Paper » presented at the annual meeting of the International Marine Conservation Congress, George Madison University, » Fairfax, Virginia, May 20, 2009 		

Demersal Trawl TR2 and TR1				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.2	Management strategy There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</p> <p>There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p> <p>There is some evidence that the partial strategy is being implemented successfully.</p>	<p>There is a <u>strategy</u> in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>

Score:	75	
Justification		
<p><i>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</i></p> <p>The MSC FAM v2 defines a partial strategy as one that represents a cohesive arrangement which may comprise one or more measures, an understanding of how they work together to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. There is no requirement for a partial strategy to have been specifically designed to manage the impact on the Component which is being considered.</p> <p>From the perspective of fisheries management, Article 2 of Council Regulation (EC) No 2371/2002 (31) provides that the CFP is to apply the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems. The CFP implements a range of restrictions on fleets and vessels that are expected to ensure the fishery does not pose a risk of serious or irreversible harm to seabed habitat types.</p> <p>Many other EU management measures are also relevant, such as those focused on environmental protection. EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora required Denmark to create a network of protected areas within which the most sensitive and /or vulnerable habitats and species are protected. At time of assessment, Denmark has designated a number of areas in the North Sea for the presence of Annex I seabed habitats (including Reef and Sandbanks which are slightly covered by seawater at all times) and Annex II species. These designations represent the first steps in the protection process and Denmark is moving into the next phase which will require consultation and the preparation and implementation of appropriate management plans and measures in order to protect qualifying interests.</p> <p>Marine spatial planning to deliver habitat protection in European waters is being developed under the European Marine Strategy to complement the habitat protection being implemented through the Habitats Directive. Implementation of all elements of the Habitats Directive will eventually lead to the creation of an ecologically coherent network of protected areas (the Natura 2000 network). The strategy includes a guideline that 20% of each habitat should be protected and that appropriate levels of management will be provided to ensure that the aim of achieving and maintaining 'favourable conservation status' is achieved. According to the Habitats Directive, the conservative status of a natural habitat will be taken as "favourable" when: - its natural range and areas it covers within that range are stable or increasing, and - the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future. Under Article 11, member states must undertake surveillance of the conservation status of the natural habitats and species referred to in the Directive, with particular regard to priority natural habitat types and priority species. The Habitats Directive also requires member states to report to the Commission on implementation every 6 years (article 17).</p>		

Other measures at national and fleet level have also contributed to a steady lessening of habitat impacts by Danish demersal trawl fisheries. One such example has been the significant decommissioning that has taken place in the Danish fleet. The Danish policy of individual transferable quotas (known as the FKA) was also implemented in January 2007, to further consolidate fleet numbers, and reduce the amount of vessels that engage in most sea fisheries. Under this system, national quotas are divided amongst the fleet; which may in turn then pool or trade fishing entitlements. The introduction of this system brought about a rapid and ongoing contraction of the fleet that brought about the decommissioning of 25% of vessels within 18 months. The trend of fewer vessels is also likely to continue as the fleet reorganises and adjusts to the new licensing regime. With the reduction in vessel numbers, it is reasonable to expect that the intensity and frequency of demersal trawling will decrease further in time, thereby reducing trawling pressure and impacts on seabed habitats.

European fisheries legislation also serves to protect seabed habitats from adverse fishing impacts in two further ways. In the first instance regulations set clear limits in terms of maximum fishing effort (KW days, as per the Cod recovery Plan), fishery removals (TAC's, national quotas), vessel size and power (KW) as well as overall fleet size. Through imposing restrictions, fishery regulations significantly limit the extent to which fishing may give rise to negative seabed impacts. Regulations are revised annually and the regulatory process is kept informed through fisheries control mechanisms and by wide ranging ongoing marine research programmes and focused studies.

It is reasonable to consider within the context of the FAM v2 definition that the measures detailed above constitute a partial strategy for protecting seabed habitats from serious or irreversible harm in the areas fished. It is also reasonable to surmise that the main elements of European fisheries and nature conservation legislation constitute a cohesive arrangement which will limit the potential for fishing to have negative impacts; while at the same time protecting vulnerable habitats. In both cases, ongoing research, consultation and monitoring can reasonably be expected to lead to management action should any measures cease to be effective.

There is objective basis for confidence that the partial strategy will work, however, this is NOT based on information directly about the fishery and or habitats involved.

The measures that make up the partial strategy to manage seabed impacts are considered likely to work. Fisheries regulations and limitations on fishing activity together with ongoing development and implementation of conservation site management plans in relation to SAC designations are considered likely to work based on plausible argument and a consideration of the positive effects that restrictions on fishing in marine protected areas have had in other parts of Europe. Specific knowledge in relation to the spatial distribution of the demersal trawl fisheries and the general seabed habitats where these occur, along with knowledge relating to the distribution and extent of OSPAR listed sensitive seabed habitats in the North Sea, adds further confidence that the measures are likely to work.

However, this scoring guidepost also requires that the partial strategy be based on information directly about the fishery and / or habitats involved. The assessment team are of the view that there is reasonable scope for greater fishery specific (i.e. local to the fleet) emphasis on management measures and partial strategy. , the second scoring guidepost is not met, thus triggering a condition.

There is some evidence that the partial strategy is being implemented successfully.

TAC's as well as Danish national quotas are rarely exceeded. The Danish North Sea trawling fleet is continuing to contract in response to the new rights based FKA management regime and periodic decommissioning. There is a reported general high level of compliance with fishery regulations by the Danish demersal trawling fleet (Danish Fisheries Inspectorate, pers. comms.). Discussions with the Danish Fisheries Directorate confirmed that management planning for Denmark's network of Natura 2000 sites is in progress and management proposals would be made available for public consultation during 2011. Accordingly the evidence suggests that ongoing progress is being made with respect to full implementation of all Articles of the Habitats Directive.

References

- » EU Council Regulation (EC) No 2371/2002 (31) the CFP and the precautionary approach
- » EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.2	Management strategy There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance. The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	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 some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved. There is some evidence that the partial strategy is being implemented successfully.	There is a <u>strategy</u> in place for managing the impact of the fishery on habitat types. The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work. There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.

Score:	80
Justification Danish seine	
<p><i>There is a <u>partial strategy</u> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</i></p> <p>The MSC FAM v2 defines a partial strategy as one that represents a cohesive arrangement which may comprise one or more measures, an understanding of how they work together to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. There is no requirement for a partial strategy to have been specifically designed to manage the impact on the Component which is being considered.</p> <p>The Danish seine UoC is relatively small in terms of vessel numbers and it is likely that effort from this gear type will further reduce in the future due to changing dynamics of the Danish fleet. The gear is associated with considerably less seabed impact than trawl gears on account of the fact that gear is not towed on the seabed for any significant distances and the gear does not rely on otter boards (trawl doors) to spread or open the net. Trawl door contact with the seabed accounts for the majority of physical damage to seabed habitats with demersal trawl gears. The 1st scoring guide management PI refers to the existence of measures or a partial strategy if necessary for managing impacts to the seabed resulting from the use of the gear type. Given the nature of Danish seine gear and the scale of its use and likely outcome, there is less of a requirement for management of its potential impacts than with demersal trawl gear.</p> <p>From the perspective of fisheries management, Article 2 of Council Regulation (EC) No 2371/2002 (31) provides that the CFP is to apply the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems. The CFP implements a range of restrictions on fleets and vessels that are expected to ensure the fishery does not pose a risk of serious or irreversible harm to seabed habitat types.</p> <p>Many other EU management measures are also relevant, such as those focused on environmental protection. EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora required Denmark to create a network of protected areas within which the most sensitive and /or vulnerable habitats and species are protected. At time of assessment, Denmark has designated a number of areas in the North Sea for the presence of Annex I seabed habitats (including Reef and Sandbanks which are slightly covered by seawater at all times) and Annex II species. These designations represent the first steps in the protection process and Denmark is moving into the next phase which will require consultation and the preparation and implementation of appropriate management plans and measures in order to protect qualifying interests.</p> <p>Marine spatial planning to deliver habitat protection in European waters is being developed under the European Marine Strategy to complement the habitat protection being implemented through the Habitats Directive. Implementation of all elements of the Habitats Directive will eventually lead to the creation of an ecologically coherent network of protected areas (the Natura 2000 network). The strategy includes a guideline that 20% of each habitat should be protected and that appropriate levels of management will be provided to ensure that the aim of achieving and maintaining 'favourable conservation status' is achieved. According to the Habitats Directive, the conservative status of a natural habitat will be taken as "favourable" when: - its natural range and areas it covers within that range are stable or increasing, and - the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future. Under Article 11, member states must undertake surveillance of the conservation status</p>	

of the natural habitats and species referred to in the Directive, with particular regard to priority natural habitat types and priority species. The Habitats Directive also requires member states to report to the Commission on implementation every 6 years (article 17).

Other measures at national and fleet level have also contributed to a steady lessening of habitat impacts by Danish demersal fisheries. One such example has been the significant decommissioning that has taken place in the Danish fleet. The Danish policy of individual transferable quotas (known as the FKA) was also implemented in January 2007, to further consolidate fleet numbers, and reduce the amount of vessels that engage in most sea fisheries. Under this system, national quotas are divided amongst the fleet; which may in turn then pool or trade fishing entitlements. The introduction of this system brought about a rapid and ongoing contraction of the fleet that brought about the decommissioning of 25% of vessels within 18 months. The trend of fewer vessels is also likely to continue as the fleet reorganises and adjusts to the new licensing regime. With the reduction in vessel numbers, it is reasonable to expect that the intensity and frequency of fishing related seabed interactions will decrease further in time, thereby reducing pressure and impacts on seabed habitats.

European fisheries legislation also serves to protect seabed habitats from adverse fishing impacts in two further ways. In the first instance regulations set clear limits in terms of maximum fishing effort (KW days, as per the Cod recovery Plan), fishery removals (TAC's, national quotas), vessel size and power (KW) as well as overall fleet size. Through imposing restrictions, fishery regulations significantly limit the extent to which fishing may give rise to negative seabed impacts. Regulations are revised annually and the regulatory process is kept informed through fisheries control mechanisms and by wide ranging ongoing marine research programmes and focused studies.

It is reasonable to consider within the context of the FAM v2 definition that the measures detailed above constitute at least a partial strategy for protecting seabed habitats from serious or irreversible harm in the areas fished. It is also reasonable to surmise that the main elements of European fisheries and nature conservation legislation constitute a cohesive arrangement which will limit the potential for fishing to have negative impacts in future years; while at the same time protecting vulnerable habitats. In both cases, ongoing research, consultation and monitoring can reasonably be expected to lead to management action should any measures cease to be effective.

There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved. The scale of the Danish seine fishery is relatively small and is concentrated in parts of the Skagerrak. The fishery also shows some temporal variation in intensity, with effort being considerably lower in the first and last quarters. Specific knowledge indicates that Danish seine fishing results in less seabed impact than does demersal otter trawling. There is reasonable knowledge in relation to the type and distribution of seabed habitats that are likely to be affected by Danish seine gears. Danish seine fishing requires relatively flat seabeds and is most suited to firm substrates such as sand and or muddy sand and gravel. It is not a favoured method for fishing on muddy or rocky seabed types (which may host more vulnerable or sensitive communities).

There is some evidence that the partial strategy is being implemented successfully.

Danish national and individual vessel quotas are rarely exceeded. The Danish North Sea fleet is continuing to contract in response to the rights based FKA (ITQ) management regime and further periodic incentivised decommissioning. There is a reported general high level of compliance with fishery regulations by all sectors of the Danish fleet (Danish Fisheries Inspectorate, pers. comms.). Discussions with the Danish Fisheries Directorate confirmed that management planning for Denmark's network of Natura 2000 sites is in progress and management proposals would be made available for public consultation during 2011. Accordingly the evidence suggests that ongoing progress is being made with respect to full implementation of all Articles of the Habitats Directive. The client has advised that the Natura 2000 process has advanced since the site visit, and fisheries closures as a result of adopted management plans have been implemented on boulder reefs (starting in coastal areas where Denmark has exclusive competencies to regulate, moving on to zones in the EEZ where EU consultation or legislation is necessary). The general 'rule of thumb' established is closure of all boulder and biogenic reefs with a buffer zone of 240 m for all towed gear. Designated sand banks will probably not be closed to trawling, as they are all in relatively shallow, high energy zones (thus not vulnerable to trawling impact).

References

- » EU Council Regulation (EC) No 2371/2002 (31) the CFP and the precautionary approach
- » EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

Set net				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.2	Management strategy There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</p> <p>There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p> <p>There is some evidence that the partial strategy is being implemented successfully.</p>	<p>There is a strategy in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>

Score:	85	
Justification set net		
<p><i>There is a <u>strategy</u> in place for managing the impact of the fishery on habitat types.</i> The MSC FAM v2 defines a strategy as one that represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how they work together to achieve an outcome and which should be designed to manage impacts on that component specifically. Given the relatively benign and static nature of setnet gear as well as the limited scale of its use it is considered that the measures in place are sufficient to be considered as a strategy that will limit impacts of the fishery and avoid serious or irreversible harm as defined by the FAM.</p> <p>The setnet Unit of Certification is relatively small in terms of vessel numbers. Although it is possible that effort from this gear type may increase in the future due to changing dynamics of the Danish fleet. The gear is associated with considerably less seabed impact than most other demersal commercial fishing gears on account of the fact that there is minimal contact with the seabed by any components of the gear that are capable of causing damage or having an impact. Anchors that are used to hold gear in position are generally less than 50kg and only limited numbers need to be deployed (2 per line).</p> <p>From the perspective of fisheries management, Article 2 of Council Regulation (EC) No 2371/2002 (31) provides that the CFP is to apply the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems. The CFP implements a range of restrictions on fleets and vessels that are expected to ensure the fishery does not pose a risk of serious or irreversible harm to seabed habitat types.</p> <p>Many other EU management measures are also relevant, such as those focused on environmental protection. EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora required Denmark to create a network of protected areas within which the most sensitive and /or vulnerable habitats and species are protected. At time of assessment, Denmark has designated a number of areas in the North Sea for the presence of Annex I seabed habitats (including Reef and Sandbanks which are slightly covered by seawater at all times) and Annex II species. These designations represent the first steps in the protection process and Denmark is moving into the next phase which will require consultation and the preparation and implementation of appropriate management plans and measures in order to protect qualifying interests.</p> <p>Marine spatial planning to deliver habitat protection in European waters is being developed under the European Marine Strategy to complement the habitat protection being implemented through the Habitats Directive. Implementation of all elements of the Habitats Directive will eventually lead to the creation of an ecologically coherent network of protected areas (the Natura 2000 network). The strategy includes a guideline that 20% of each habitat should be protected and that appropriate levels of management will be provided to ensure that the aim of achieving and maintaining 'favourable conservation status' is achieved. According to the Habitats Directive, the conservative status of a natural habitat will be</p>		

taken as "favourable" when: - its natural range and areas it covers within that range are stable or increasing, and - the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future. Under Article 11, member states must undertake surveillance of the conservation status of the natural habitats and species referred to in the Directive, with particular regard to priority natural habitat types and priority species. The Habitats Directive also requires member states to report to the Commission on implementation every 6 years (article 17).

Other measures at national and fleet level have also contributed to a steady lessening of habitat impacts by Danish demersal fisheries. One such example has been the significant decommissioning that has taken place in the Danish fleet. The Danish policy of individual transferable quotas (known as the FKA) was also implemented in January 2007, to further consolidate fleet numbers, and reduce the amount of vessels that engage in most sea fisheries. Under this system, national quotas are divided amongst the fleet; which may in turn then pool or trade fishing entitlements. The introduction of this system brought about a rapid and ongoing contraction of the fleet that brought about the decommissioning of 25% of vessels within 18 months. The trend of fewer vessels is also likely to continue as the fleet reorganises and adjusts to the new licensing regime. With the reduction in vessel numbers, it is reasonable to expect that the intensity and frequency of fishing related seabed interactions will decrease further in time, thereby reducing pressure and impacts on seabed habitats.

European fisheries legislation also serves to protect seabed habitats from adverse fishing impacts in two further ways. In the first instance regulations set clear limits in terms of maximum fishing effort (KW days, as per the Cod recovery Plan), fishery removals (TAC's, national quotas), vessel size and power (KW) as well as overall fleet size. Through imposing restrictions, fishery regulations significantly limit the extent to which fishing may give rise to negative seabed impacts. Regulations are revised annually and the regulatory process is kept informed through fisheries control mechanisms and by wide ranging ongoing marine research programmes and focused studies.

It is reasonable to consider within the context of the FAM v2 definition that the measures detailed above constitute at least a partial strategy for protecting seabed habitats from serious or irreversible harm in the areas fished. It is also reasonable to surmise that the main elements of European fisheries and nature conservation legislation constitute a cohesive arrangement which will limit the potential for fishing to have negative impacts in future years; while at the same time protecting vulnerable habitats. In both cases, ongoing research, consultation and monitoring can reasonably be expected to lead to management action should any measures cease to be effective.

There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved. The setnet fishery is relatively small and shows some temporal variation in intensity. Setnets are considered to be 'low-impact' gears. Anecdotal and more specific knowledge from general studies on fisheries and environmental interaction indicates that setnet fishing results in significantly less seabed impact than demersal otter trawling. There is reasonable knowledge in relation to the type and distribution of seabed habitats that are likely to be affected by setnet gear in this fishery. The strategy has not been tested however (SG100).

There is some evidence that the partial strategy is being implemented successfully.

TAC's, Danish national and individual vessel quotas are rarely exceeded. The Danish North Sea fleet is continuing to contract in response to the rights based FKA (ITQ) management regime and further periodic incentivised decommissioning. There is a reported general high level of compliance with fishery regulations by all sectors of the Danish fleet (Danish Fisheries Inspectorate, pers. comms.). Discussions with the Danish Fisheries Directorate confirmed that management planning for Denmark's network of Natura 2000 sites is in progress and management proposals would be made available for public consultation during 2011. Accordingly the evidence suggests that ongoing progress is being made with respect to full implementation of all Articles of the Habitats Directive.

References

- » EU Council Regulation (EC) No 2371/2002 (31) the CFP and the precautionary approach
- » EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.2	Management strategy There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</p> <p>There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p> <p>There is some evidence that the partial strategy is being implemented successfully.</p>	<p>There is a strategy in place for managing the impact of the fishery on habitat types.</p> <p>The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work.</p> <p>There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>

Score:	95	
Justification Long line		
<p><i>There is a <u>strategy</u> in place for managing the impact of the fishery on habitat types.</i> The MSC FAM v2 defines a strategy as one that represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how they work together to achieve an outcome and which should be designed to manage impacts on that component specifically. Given the relatively benign and static nature of longline gear as well as the limited scale of its use it is considered that the measures in place are sufficient to be considered as a strategy that will limit impacts of the fishery and avoid serious or irreversible harm as defined by the FAM.</p> <p>The longline Unit of Certification is very small in terms of vessel numbers (only two <20m vessels at time of the site visit), although it is likely that effort from this gear type may increase in the future due to changing dynamics of the Danish fleet. The gear is associated with considerably less seabed impact than any other commercial fishing gears on account of the fact that there is minimal contact with the seabed by any components of the gear that are capable of causing damage or having an impact. Anchors that are used to hold gear in position are generally less than 50kg and only limited numbers need to be deployed (2 per line).</p> <p>From the perspective of fisheries management, Article 2 of Council Regulation (EC) No 2371/2002 (31) provides that the CFP is to apply the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems. The CFP implements a range of restrictions on fleets and vessels that are expected to ensure the fishery does not pose a risk of serious or irreversible harm to seabed habitat types.</p> <p>Many other EU management measures are also relevant, such as those focused on environmental protection. EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora required Denmark to create a network of protected areas within which the most sensitive and /or vulnerable habitats and species are protected. At time of assessment, Denmark has designated a number of areas in the North Sea for the presence of Annex I seabed habitats (including Reef and Sandbanks which are slightly covered by seawater at all times) and Annex II species. These designations represent the first steps in the protection process and Denmark is moving into the next phase which will require consultation and the preparation and implementation of appropriate management plans and measures in order to protect qualifying interests.</p> <p>Marine spatial planning to deliver habitat protection in European waters is being developed under the European Marine Strategy to complement the habitat protection being implemented through the Habitats Directive. Implementation of all elements of the Habitats Directive will eventually lead to the creation of an ecologically coherent network of protected areas (the Natura 2000 network). The strategy includes a guideline that 20% of each habitat should be protected and that appropriate levels of management will be provided to ensure that the aim of achieving and maintaining 'favourable conservation status' is achieved. According to the Habitats Directive, the conservative status of a natural habitat will be taken as "favourable" when: - its natural range and areas it covers within that range are stable or increasing, and - the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future. Under Article 11, member states must undertake surveillance of the conservation status of the natural habitats and species referred to in the Directive, with particular regard to priority natural habitat types and</p>		

priority species. The Habitats Directive also requires member states to report to the Commission on implementation every 6 years (article 17).

Other measures at national and fleet level have also contributed to a steady lessening of habitat impacts by Danish demersal fisheries overall, although longline fisheries are relatively new. One such example has been the significant decommissioning that has taken place in the Danish fleet. The Danish policy of individual transferable quotas (known as the FKA) was also implemented in January 2007, to further consolidate fleet numbers, and reduce the amount of vessels that engage in most sea fisheries. Under this system, national quotas are divided amongst the fleet; which may in turn then pool or trade fishing entitlements. The introduction of this system brought about a rapid and ongoing contraction of the fleet that brought about the decommissioning of 25% of vessels within 18 months. The trend of fewer vessels is also likely to continue as the fleet reorganises and adjusts to the new licensing regime. With the reduction in vessel numbers, it is reasonable to expect that the intensity and frequency of fishing related seabed interactions will decrease further in time, thereby reducing pressure and impacts on seabed habitats.

European fisheries legislation also serves to protect seabed habitats from adverse fishing impacts in two further ways. In the first instance regulations set clear limits in terms of maximum fishing effort (KW days, as per the Cod recovery Plan), fishery removals (TAC's, national quotas), vessel size and power (KW) as well as overall fleet size. Through imposing restrictions, fishery regulations significantly limit the extent to which fishing may give rise to negative seabed impacts. Regulations are revised annually and the regulatory process is kept informed through fisheries control mechanisms and by wide ranging ongoing marine research programmes and focused studies.

It is reasonable to consider within the context of the FAM v2 definition that the measures detailed above constitute a strategy that will protect seabed habitats from serious or irreversible harm caused by the use of longline in the areas fished. It is also reasonable to surmise that the main elements of European fisheries and nature conservation legislation constitute a cohesive arrangement which will limit the potential for fishing to have negative impacts in future years; while at the same time protecting vulnerable habitats. In both cases, ongoing research, consultation and monitoring can reasonably be expected to lead to management action should any measures cease to be effective.

There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved. The scale of the longline fishery is very small and is limited to waters off the east Jutland coast. Specific knowledge indicates that longline fishing is highly unlikely to result in significant impacts to any seabed habitat types that are known to occur in the area of use. However, the strategy has not been specifically *tested* (as required at SG100).

There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective. TAC's, Danish national and individual vessel quotas are rarely exceeded. The Danish North Sea fleet is continuing to contract in response to the rights based FKA (ITQ) management regime and further periodic incentivised decommissioning. There is a reported general high level of compliance with fishery regulations by all sectors of the Danish fleet (Danish Fisheries Inspectorate, pers. comms.). Discussions with the Danish Fisheries Directorate confirmed that management planning for Denmark's network of Natura 2000 sites is in progress and management proposals would be made available for public consultation during 2011. Accordingly the evidence suggests that ongoing progress is being made with respect to full implementation of all Articles of the Habitats Directive. Longline gear types are favoured on relatively clean ground and rocky or rough ground where they may become entangled and cause damage is avoided (DFPO, pers comms.)

The fishery is limited to seabed areas where there is minimal possibility of negative habitat impacts and the management response is clearly adequate in the context of limiting the fisheries potential to negatively impact seabed habitats and communities.

References

- » EU Council Regulation (EC) No 2371/2002 (31) the CFP and the precautionary approach
- » EU Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.3	Information monitoring Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	<p>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.</p> <p>Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.</p>	<p>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.</p> <p>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).</p>	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Changes in habitat distributions over time are measured.</p> <p>The physical impacts of the gear on the habitat types have been quantified fully.</p>

Score:	All UoCs 85
Justification	
<p><i>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</i></p> <p>OSPAR collate data from a wide range of European institutions in relation to the distribution of 14 main vulnerable and sensitive marine habitats. Data are collated and used to generate maps of the location of the main habitat of concern, and maps are available of most areas in the Northeast Atlantic including the North Sea. Data are submitted to OSPAR on an ongoing basis by organisations within countries that are signatories to the Convention and who are researching their seabed environment on an ongoing basis.</p> <p>The Mapping European Seabed Habitats (MESH) project also collated a wide range of data for five member countries that participated in the project. The project has produced a web resource that can be used to build detailed seabed habitat maps for most European waters of the North East Atlantic. The information available to assist in managing the impacts of the fishery on seabed habitats team through this medium is considered relevant and has been taken into account in evaluating the fishery under this Performance Indicator.</p> <p>Also of relevance is The Digital Atlas of the North Sea. This document has collated the findings of many environmental surveys and studies in relation to the North Sea into a single useable source. In order to produce a habitat map showing North Sea sediments, the results of a broad range of studies were collated and a Broad scale seabed habitat map of the North Sea is available. The area of coverage includes all that within which the vessels under assessment routinely fish. The map is based on high quality and high resolution data and confirms that the DFPO vessels fish for hake and haddock trawls on mainly sandy and occasionally muddy sand areas.</p> <p>The MARGIS project integrates a range of data sets in relation to seabed sedimentology, biota, chemistry and other criteria for the North East Atlantic. Specific queries in relation to the sedimentological, chemical, bathymetric and biological profile of many areas of the North Sea can be made at http://gisweb2.awi.de/Website/margis/viewer.htm.</p> <p>Seabed habitat maps generated using these tools have been considered in the evaluation of the potential impacts of the trawl, Danish seine, set net and longline fisheries in relation to the habitat performance indicator. They have been found to be useful and adequate for the purpose of identifying the likely main habitats in the areas fished.</p> <p>For this Performance Indicator, FAMv2 defines “vulnerability” as the combination of the likelihood that the gear would encounter the habitat and the likelihood that the habitat would be altered if an encounter between the gear and the habitat did occur.</p> <p>The vulnerability of all main seabed habitat types potentially affected by the fishery is known at least in a general context. For example, it is known that once sandy sediments are disturbed and suspended in the water column such as may occur with trawling activity, they will tend to settle out of the water and onto the seabed much faster than will other finer sediments. In a similar manner, sandy sediments are often implicated in seabed ‘scour’ – a natural process whereby seabed sediments may be moved along the seabed by tidal current or wave action. Accordingly, associated</p>	

communities tend to be more adjusted to and tolerant of physical disturbance, while the recovery rate of typical faunal communities is characteristically higher on account of the greater natural variability associated with sandy substrates over muddy substrates. Given the extent of the habitats that are known or predicted to occur in the areas that the trawl fisheries takes place, the team considered it unlikely that the habitat would be permanently altered if an encounter between the gear and the habitat did occur. In arriving at this conclusion the team found available information to be adequate to support this conclusion. The team considered the main affected habitat type, associated seabed communities, levels of natural variability and the full range or extent of this habitat within the North Sea and Skagerrak and not just the part of the habitat that overlaps with the fishery (FAMv2 7.5.3).

Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

The impacts of trawling activity on the seabed and associated communities has been the focus of extensive research in the past and efforts to improve the understanding of the impacts of mobile fishing gears are ongoing in many parts of the world. This is especially the case within the European Union. A broad range of scientific studies have evaluated different levels of trawling activity on differing types of seabed, as measured by physical criteria including habitat extent and variability, seabed relief, sediment sorting and bottom damage or alteration.

Many studies have also examined the impacts of trawling using biological indicators such as species diversity, abundance, rates of recovery and other criteria. Sufficient data are available to allow the nature of the impacts of the DFPO fishery on habitat types to be identified. Jennings et al (2001); Trimmer et al (2005); Hiddink et al (2006a); Kaiser et al, (1998) and Callaway et al 2007 all discuss the effects of trawling on seabed habitats and benthic communities. Hiddink et al (2006) show that based on modelling, the biomass of benthic communities in habitats subject to high levels of natural disturbance was less affected by additional trawling disturbance than the community in naturally stable habitats. The effect of trawling was predicted to be smaller on muddy than on sand and gravel sediments, but this effect is relatively unimportant compared with the effect of natural disturbance. Other authors also point to the finding that trawling has significantly less impact on seabed habitats and communities in areas that are subject to high natural variability.

The fishery is heavily concentrated in the Skagerrak and along the southern edge of the Norwegian Trench, as confirmed by VMS fishing effort density plots that show where effort is concentrated by the demersal trawl fleet. Available VMS data are for all vessels <15m and this data is considered reliable in terms of showing the spatial extent, timing and location for the vast majority of fishing activity. Sufficient data has been available to the team to determine that there are few vulnerable habitats within the area where the fishery operates. Vulnerable habitats that are known from Danish offshore waters include some small areas of reef; however this fishery is not likely to interact with areas of reef to a significant degree based on knowledge of that habitats distribution and the location of fishing effort.

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).

VMS data are collected on an ongoing basis for the fishery and the distribution of effort can be monitored from this. Days at sea and vessel quotas are also monitored on an ongoing basis and this data is available for assessing the scale of risk to habitat on an ongoing basis.

Landings data are recorded by ICES statistical square and are recorded on electronic logbooks by the fleet. These data are available for 'fine-tuning' of habitat management initiatives should they prove to be necessary in the future.

European research into impacts of fishing gear on benthic communities and seabed habitats is ongoing and greater levels of research associated with marine protected area designations (such as Natura 2000) are being undertaken and will be required to continue into the future under the Habitats Directive and under commitments to OSPAR. Because of this it is reasonable to expect that our understanding of the impacts of mobile fishing gears will develop and be further refined in the future. This is also expected to assist in identifying increased risk to habitats in the future and will inform management of fisheries impacts to a significant degree in the future also.

All 3 scoring guideposts at SG 80 are met; and the first of SG100: therefore a score of 85 is awarded.

References

- » 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.
- » Trimmer, M., Petersen, J., Sivyer, D.B., Mills, C., Young, E., Parker, E.R., 2005. Impact of long-term benthic trawl disturbance on sediment sorting and biogeochemistry in the southern North Sea. Marine Ecology Progress Series 298, 79-94.
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2.5	Ecosystem
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All UoCs

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.5.1	Status The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	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 <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

Score:	All UoCs 90
Justification	
<p>The function and structure of the North Sea ecosystem is well known, as is the role of hake within this ecosystem. CEFAS recently published an ecosystem model of the North Sea (Mackinson and Daskalov, 2008) which documents the trophic level and predator-prey relationship between 68 different species, from cetacean to polychaete.</p> <p>Ecosystem models are tools that allow the effects of different management measures on the ecosystem to be understood, for example MPAs. Mackinson and Daskalov (2008) state that “<i>The model is best 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. It is not useful for short-term tactical question regarding fisheries management. It is complementary to existing approaches; helping managers and policy makers by giving them a view of the possible surprising and counter-intuitive effects of particular management and policy options</i>”.</p> <p>Having been at a consistently low stock biomass between 1986 and 2001/2 a hake recovery plan was agreed by the EU in 2004 (EC Reg. No. 811/2004). The aim of the plan was to increase the SSB to above 140 000 t with a fishing mortality (FMP) of 0.25. According to ICES Advice for 2013, the hake spawning biomass has been increasing since 1998 and is estimated to be record high in 2013. Fishing mortality has been decreasing in recent years, and is near FMSY. Clearly, of the stock has recovered and this is expected to contribute to preserving the function and role of the northern hake stock in the ecosystem of the North Sea and Skagerrak.</p> <p>Hake is recognised as a key predator and has a high trophic level of 4.91; compared to juvenile and adult cod trophic levels of 4.43 and 4.83 respectively; large piscivorous sharks at 4.93 and seals at 5. Accordingly, being a top predator itself, hake do not form a significant prey for other species, although adult fish are consumed by seals and toothed whales, while smaller fish and juveniles may become prey species for gadoids. Hake feed principally on other fish (<90% of diet). Juvenile hake feed extensively on sprat, sandeels and smaller clupeids. Small hake may also be cannibalistic, although larger hake do not appear to feed on small hake as they are normally present on separate grounds.</p> <p>Given its ecological role as a top level predator (the top level fish predator) in the North Sea, the removal of hake at current levels is highly unlikely to disrupt the key elements of the underlying ecosystem structure and function to a point where there would be serious or irreversible harm. While some published evidence to support this does exist, it is based on the North Sea ecosystem as a whole and not specific to the Norwegian Trench and Skagerrak area. It is therefore considered that the SG100 issue is not met in full and a score of 90 is awarded.</p>	
References	
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All UoCs				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.5.2	Management strategy There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	<p>There are measures in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</p>	<p>There is a partial strategy in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</p> <p>There is some evidence that the measures comprising the partial strategy are being implemented successfully.</p>	<p>There is a <u>strategy</u> that consists of a <u>plan</u>, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.</p> <p>There is evidence that the measures are being implemented successfully.</p>

Score:	All UoCs 90	
Justification		
<p>There is a <u>partial strategy</u> in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>Sustainable management of fisheries within the waters of the European Union are facilitated and effected under the framework of the Common Fisheries Policy. For the future, the CFP recognises the need to manage fisheries collectively on a multispecies basis as well as recognising the need to increasingly take into account ecosystem aspects and influences in formulating future fishery management policy and in developing management plans. Significant advances are being made at scientific level principally through ICES e.g. Working Group on Multispecies Assessment Methods (WGSAM), in order to support the development of multispecies assessment methodologies. Denmark's commitment to the CFP supports future developments with respect to fisheries management at European level and forms the basis of a partial strategy that is increasingly expected to take into account and restrain ecosystem impacts of the fishery in the future.</p> <p>While implementation of a full ecosystem approach to fisheries management is still some way off and in depth scientific debate is taking place at an international level as to the best ways to implement such a policy (Garcia & Cochrane, 2005; Plagányi, 2007), some measures are in place in the interim to identify and avoid or reduce ecosystem impacts of the fishery where possible. The Danish North Sea and Skagerrak mixed demersal fishery catches a variety of mainly quota species including haddock, saithe, cod, sole and hake. A full suite of management measures apply to quota species at fleet level including vessel licensing, quota allocation and effort limitation; while a second tier of technical control measures adds to the partial strategy to manage ecosystem impacts of the fishery. In addition, the EU promotes research into reducing ecosystem impacts of fishing and has funded a number of important research projects designed</p>		

to investigate fishing gear modifications in order to reduce ecosystem impacts (such as the RECOVERY and REDUCE projects).

Further provisions of European law designed to protect the environment and ecosystems, such as the Marine Strategy Framework Directive, Water Framework Directive and Habitats Directive (Council Directive 92/43/EEC; Council Directive 2000/60/EC (Water Framework Directive); Council Directive 2008/56/EC) are likely to play a growing role in limiting fishery related ecosystem impacts in the future. In particular, the Habitats Directive is likely to play a much greater role in protecting sensitive marine habitats, once clear conservation objectives and management regimes for Natura 2000 sites have been agreed and implemented. The Marine Strategy Framework Directive also aims to establish a global network of Marine Protected Areas by 2012.

The measures are considered likely to work based on prior experience, plausible argument and information directly from the fishery/ecosystems involved. The partial strategy generally takes into account European environmental policy and also reflects current international scientific thinking. It is also intended to be both adaptive to change and reactive. Based on this it is considered likely that the partial strategy will be successful in ensuring the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.

There is evidence that the measures comprising the partial strategy are being implemented successfully. Denmark has shown clear commitment to the CFP and has made significant advances in managing its national fisheries in accordance with the aspirations and objectives of the Common Fisheries Policy to create long term sustainability in European Fisheries. Denmark has implemented the provisions of the Habitats Directive and a series of management plans for marine Natura 2000 sites are due to enter into public consultation stage during 2011.

The assessment team were satisfied that all of the scoring guides at SG80 were met, along with two at SG 100. Accordingly a score of 90 was recorded.

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- » Council Directive 2008/56/EC (Marine Strategy Framework Directive)

2.5	Ecosystem
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All UoCs				
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.5.3	Information monitoring There is adequate knowledge of the impacts of the fishery on the ecosystem.	<p>Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.</p>	<p>Information is adequate to broadly understand the functions of the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail.</p> <p>The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>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.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>The impacts of the fishery on target, Bycatch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are <u>understood</u>.</p> <p>Sufficient information is available on the impacts of the fishery on the Components <u>and elements</u> to allow the main consequences for the ecosystem to be inferred.</p> <p>Information is sufficient to support the development of strategies to manage ecosystem impacts.</p>

Score:	All UoCs 90	
Justification		
<p>Information is adequate to <u>broadly understand</u> the key elements of the ecosystem. Key elements include the trophic structure of the North Sea/Skagerrak ecosystem such as key prey, predators and competitors; community composition, productivity patterns and characteristics of biodiversity. Greenstreet <i>et al.</i> 1997 describe seasonal variation in the consumption of food by fish in the North Sea and implications for food web dynamics.</p> <p>Main <u>interactions</u> between the fishery and these ecosystem elements can be inferred from existing information, and <u>have been investigated</u>. (Mackinson, 2001) describes the construction and calibration of an ecosystem model of the North Sea using the Ecopath with Ecosim approach. Models of this type readily lend themselves to answering simple, ecosystem wide questions about the dynamics and the response of the ecosystem to anthropogenic changes. Thus, they can help design policies aimed at implementing ecosystem management principles, and can provide testable insights into changes that have occurred in the ecosystem over time.</p> <p>The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are <u>known</u>. It is known that hake is a key top predator of clupeids and smaller demersal species in the North Sea. Other species of fish that are retained or bycaught in the fishery are mainly demersal species and as such comprise predators (haddock, saithe, lemon sole, cod) and to a much lesser degree scavengers (Nephrops). Bycatch species include</p>		

juvenile saithe, cod and haddock, the main functions for all of which are known. There is reasonable understanding with respect to the impact of the fishery on both ETP species and seabed habitats.

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. Sections 2.1.3, 2.2.3, 2.3.3 and 2.4.3 outline the array of data that are collected in relation to the fishery. The range of data is sufficient to allow the main impacts on these components to be inferred directly.

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). Data is routinely collected on an ongoing basis to allow for the detection of any change or increase in risk level to the main ecosystem components. Key data collected include landings data for all species, discard data from observer trips and reports, spatial data in relation to fishing effort (via EU logbooks and VMS) and data in relation to fishing effort.

References

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PRINCIPLE 3				
3	The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable			
3.1	Governance and Policy			
	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.1	<p>Legal and/or customary framework</p> <p>The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> - Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; - 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. 	<p>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.</p> <p>The management system incorporates or is subject by law to a <u>mechanism</u> for the resolution of legal disputes arising within the system.</p> <p>Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.</p> <p>The management system has a mechanism to <u>generally respect</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes which is <u>considered to be effective</u> in dealing with most issues and that is appropriate to the context of the fishery.</p> <p>The management system or fishery is attempting to comply in a timely fashion with binding judicial decisions arising from any legal challenges.</p> <p>The management system has a mechanism to <u>observe</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes that is appropriate to the context of the fishery and <u>has been tested and proven to be effective</u>.</p> <p>The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.</p> <p>The management system has a mechanism to <u>formally commit</u> to the legal rights created explicitly or established by custom on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>

Score:	85
Justification	
<p>SG 60: The management system is generally consistent with local, national or international laws</p> <p>The principle legislative instrument for fisheries management in the EU is the Common Fisheries Policy, CFP, which aims at achieving sustainable fisheries management across the EU. This clearly aims to achieve both P1 (stock management) and possibly to a lesser extent P2 (wider ecosystem impacts). For example, the regulation states</p>	

“conservation, management and exploitation of living aquatic resources Bearing in mindUNCLOS. The objective of the CFP should therefore be to provide for sustainable exploitation of living aquatic resources in the context of sustainable development, taking account of the environmental, economic and social aspects in a balanced manner.”

Beneath the umbrella of the CFP, there are many binding regulations covering all aspects of fisheries, which are amended and updated as required. For example, some of the key recent pieces of legislation include the new Control Regulation and requirement for Registration of Buyers.

The CFP is enacted into Danish law by the Danish Fisheries Act of 1999, which directly reflects the scope and objective of the CFP and as such aims at achieving sustainable fisheries in accordance to MSC P1 and P2.

The four SG60 scoring issues are met.

SG80 a: The management system incorporates a transparent mechanism for the resolution of legal disputes, considered effective...

The main mechanism for the resolution of legal disputes is the Danish judicial system. In event of a fisheries infringement the Danish Fisheries Directorate (Fiskeridirektoratet) pass details to the public prosecutor who will then decide the value of the fine. Fishermen, or industry representatives can appeal to the full judicial process. Within Denmark itself, the system can therefore be ‘*considered effective*’. Similarly, recent infraction proceedings taken by the Commission against several Member States- for example France for exceeding their portion of the EU TAC in several fisheries, demonstrate that the at EU level the mechanism can be ‘*considered effective*’. Difficulties in achieving resolution beyond the EU, however, have been seen. For example, the escalating high profile dispute between the EU and Faroe Islands relating to Western Mackerel catches, and recent failure to agree the 2010 Plaice quota with Norway. However “*within the context of this fishery*”, this scoring indicator can be considered to be met.

SG80 b and c: These are also met since the management system is able to comply with binding legal decisions and contains a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood.

SG100 a: The EU management system has not always been proven to be effective in resolving disputes so the scoring issue is not met.

SG100 b: The management system or fishery acts proactively to avoid legal disputes.....

Following the review of the CFP in 2002, much increased emphasis was placed on stakeholder engagement in the management process as a means of proactively avoiding disputes. Regional Advisory Councils (RAC) were created, including one for the North Sea that has a number of specific Working Groups, with active representation of both fishermen and environmental NGOs, and participation of regulators and managers with observer status. RAC nominees are explicitly included on advisory bodies such as ACFA.

Additionally in Denmark, both the Ministry and the Directorate act proactively with the industry to discuss management proposals, and address industry concerns. There are monthly meetings between the industry and the ministry (paragraph 5 & paragraph 6 committee), which have done much to foster proactive dialogue in recent years. The scoring issue is met.

SG100 c: The management system has a mechanism to formally commit to the legal rights

The EU CFP sets out a formal commitment to the legal and customary rights of people dependent on fishing, through a commitment to relative stability (meaning Member States are consistently allocated the same proportion of particular stocks):

“In view of the precarious economic state of the fishing industry and the dependence of certain coastal communities on fishing, it is necessary to ensure relative stability of fishing activities by the allocation of fishing opportunities among the Member States, based upon a predictable share of the stocks for each Member State.”

How the allocation is divided within member states is then laid out at national level in the National Strategy Plan (in accordance with EC no 1198/2006). The Danish national strategy plan for fisheries explicitly considers fishing communities and includes a number of socio-economic objectives, which can be achieved whilst remaining consistent with P1 & 2 (stock management & ecosystem) objectives. It is of note that these objectives also seek to be in accordance with the Lisbon Strategy for growth and employment: These include:

1. Maintenance of employment in fishing areas / avoid population decline
2. Facilitating new entrants to the fishing industry
3. Integrated / strategic development of ports – including rural or niche ports
4. Ensure local communities are vibrant and the quality of life is high.

The movement toward and ITQ system in Denmark is also based on the principle of historic rights (track record) although experience elsewhere suggests that in time this link with track record will decline, and fishing opportunity will become concentrated in fewer hands.

However, although the CFP has clearly stated aims, there is a consensus amongst many stakeholders, both within the fishing industry and environmental NGOs that the CFP has failed to achieve its objectives as described by P1 and P2, in many EU fisheries. It is estimated that 91% of stocks covered by the CFP will fail to reach MSY by 2015 (Froese and Proelss 2010). The scoring issue is not entirely met.

The SG80 scoring issues are met and one of the three SG100 scoring issues is met. Consequently, the score in this section is 85.

Denmark ratified the United Nations Convention on the Law of the Sea (UNCLOS) convention in 2004.

References

1. EC 2002. Council Regulation No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. Official Journal of the European Union L 358, 59-80.
2. Danish Fisheries Act 1999.
3. Froese and Proelss 2010. Rebuilding fish stock no later than 2015: will Europe meet the deadline? Fish and Fisheries 11:194-202
4. Ministry of Food Agriculture and Fisheries (2007). National Strategic Plan for development of the Danish Fisheries and Aquaculture Sector.
5. <http://www.nsrac.org/category/nsrac-working-groups/demersal-nsrac-working-groups/>

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.2	Consultation, roles and responsibilities 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.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>generally understood</u> . The management system includes consultation processes that <u>obtain relevant information</u> from the main affected parties, including local knowledge, to inform the management system.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>explicitly defined and well understood for key areas</u> of responsibility and interaction. The management system includes consultation processes that <u>regularly seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained. The consultation process <u>provides opportunity</u> for all interested and affected parties to be involved.	The management system includes consultation processes that <u>regularly seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information and <u>explains how it is used or not used</u> . The consultation process <u>provides opportunity and encouragement</u> for all interested and affected parties to be involved, and <u>facilitates</u> their effective engagement.

Score:	80
Justification	
<p><i>SG 80 a: Organisations / individuals in management process are explicitly defined and well understood for all areas of responsibility...</i></p> <p>Section 5 of this assessment report provides a description of the key roles and responsibility in the fishery management process. Consultations and roles within them, are well defined at both an EU level, through, for example, participation in the NSRAC, and at national and local levels via Danish Fisheries Directorate and similar.</p> <p>Briefly, these include:</p> <ol style="list-style-type: none"> 1. Management / administration: EU DG Mare, Danish Ministry of Food Agriculture and Fisheries, Danish Fisheries Directorate 2. Scientific Advice: ICES, EU's STECF & ACOM, DTU Aqua (Danish Technical University). 3. Control & Enforcement: EU Community Fisheries Control Agency (CFCA) , Danish Fisheries Directorate 4. Industry Representation: DFPO, Danish Fisherman's Association www.fiskeriforening.dk, and the United Federation of Danish Workers. 5. Industry / NGO / Scientific liaison: North Sea RAC and participation in the NSRAC demersal working group 6. Denmark / the North Sea region also has strong NGO representation, which, over recent years have played an important role in encouraging a more ecosystem-based approach to fisheries management. <p>Within Denmark, the move to an ITQ system has led to significant rationalisation of the fleet, and has also allowed individual owners and groups of owners to take responsibility for matching their quotas to their catching opportunities. The industry appears to understand and execute this responsibility well, and most involved in the management process for quotas appear satisfied that it is successful.</p>	

In each of the cases highlighted above there is clear and transparent explanation provided (most simply found on their respective websites) on the roles and responsibilities – both for those with statutory and non-statutory roles.

The scoring issue is met.

SG80 b: The management system includes consultation processes that regularly seek and accept relevant information, including local

knowledge and demonstrates consideration of the information obtained.

The best examples of this are, at EU level, the work of the North Sea RAC, the specialist working groups that exist within it and at Danish level, the work of the Paragraph 5 and Paragraph 6 Ministerial committees. The RAC is a formalised industry consultation process, which has contributed much in recent years to the development of multi-annual plans for a number of fisheries, including haddock in Area IV/IIIa, and the Western Hake stock of which the Danish Hake fishery forms a small part. There is clear evidence that the work of the RAC influences the Commission and Council of Ministers. These meetings are regular and provide an effective conduit for local knowledge into the management system. However, both in the case of EU consideration of RAC proposals and the work of the Danish ministerial committees, there is **not** always a clear explanation provided (minuted outputs) of how the information is used or not used. This is especially true of decisions taken by politicians at Fisheries Council.

The scoring issue is met.

SG80 c: The consultation process provides opportunity for all interested and affected parties to be involved.

Danish industry and NGOs have participated actively at EU levels, both in responding to consultations, and engaging more formally via the RACs, and EU advisory committees. Danish representatives of Europeche and the European Association of Producer Organisations, EAPO, have regularly represented the European catching sector on these committees.

A good recent example of this is the consultation process on the reform of the common fisheries policy (which itself closely mirrors the consultation process that preceded the drafting of the reformed CFP in 2002). The 2009 Green paper on the reform of the CFP expressly states that its purpose is “to trigger and encourage public debate and to elicit views on the future CFP. The Commission invites all interested parties to comment on the questions set out in this Green Paper”. Clear guidelines are provided on how, where and when to respond. The Danish Government and industry and other interested parties have actively taken up the opportunity to respond, as have the North Sea RAC. Contributions to this consultation process can be viewed at : http://ec.europa.eu/fisheries/reform/consultation/received/index_en.htm

SG 100: The degree to which the consultation process facilitates engagement for all is less clear. Although there was active facilitation to get industry and key vocal stakeholders to contribute to the reform consultation, it is generally less clear how other maritime and marine organisations are brought into more routine fisheries management consultation. For example the degree to which marine recreation, aquaculture, aggregate extraction, NGOs and offshore industries are actively facilitated – perhaps as part of an ICZM or marine spatial planning forum is not obvious. Therefore the first SG100 scoring issue is not met.

The public consultation process, the formation of the RACs and the work of the Danish Ministry have contributed to huge improvements in proactive, facilitated engagement, but due to these slight short-comings (when compared to the theoretical ideal), the second SG100 scoring issue is not met.

A score of 80 is provided since all of the SG80 scoring issues are met but not of the SG100 scoring issues are met.

References

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2. COM (2009)163 final. GREEN PAPER. Reform of the Common Fisheries Policy
3. http://ec.europa.eu/fisheries/reform/consultation/received/index_en.htm

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.3	Long term objectives The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.	Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>implicit</u> within management policy.	<u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>explicit</u> within management policy.	<u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>explicit</u> within and <u>required by</u> management policy.

Score:	100	
Justification		
<p><i>SG100: Clear long-term objectives are explicit within and required by management policy.</i></p> <p>At the governance and policy level, clear over-arching long term objectives are set out in the EU common fisheries policy. The reform of the CFP in 2002 heralded the explicit adoption of “a precautionary approach to protect and conserve living aquatic resources, and to minimise the impact of fishing activities on marine eco-systems, and to contribute to efficient fishing activities within an economically viable and competitive fisheries industry, providing a fair standard of living for those who depend on fishing activities”. These long term objectives are clear and explicitly defined and entirely consistent with MSC P&Cs.</p> <p>The 2002 reform of the CFP also embraced a more long-term approach to fisheries management, involving the establishment of multi-annual recovery plans for stocks outside safe biological limits and of multi-annual management plans for other stocks. It aimed to progressively implement an eco-system-based approach to fisheries management.</p> <p>Article 15 of Council Regulation EC 1198/2006 on the European Fisheries Fund, requires that all member states:</p> <p>“Shall adopt, following appropriate consultation..... a national strategic plan covering the fisheries sector (which)sets out the priorities, objectives, the estimated public financial resources (in accordance with the CFP)for:</p> <p>(a) adjustment of fishing effort / capacity with regard to the evolution of fisheries resources, promotion of environmentally-friendly fishing methods and sustainable development of fishing activities;</p> <p>(e) the sustainable development of fisheries areas,</p> <p>(g) preserving human resources in the fisheries sector, through upgrading professional skills, securing sustainable employment and enhancing the position and role of women;</p> <p>(h) protection and enhancement of the aquatic environment related to the fisheries sector”.</p> <p>The Danish Ministry of Food Agriculture and Fisheries have complied with the requirements of the above regulation in ‘the National Strategic Plan for the development of the Danish Fisheries and aquaculture sector 2007 – 2013’. This clearly sets out national long term objectives under the vision: “To create the framework for the maximum possible long-term yield from the Danish fisheries and aquaculture sector, where the resources are utilised taking into account the goal of sustainability and regional development”.</p> <p>The branch objectives, below this vision are fully compliant with both the objectives of the CFP and the MSC P& Cs.</p> <p>A recovery plan for Northern Hake, of which North Sea landings are a component, was successfully put in place in 2004, as discussed against Principle 1. The Commission subsequently put forward proposals for a long term management plan in 2009 with a first objective to “<i>maintain the biomass of the hake stock at a level that allows its sustainable exploitation on the basis of a target fishing mortality rate that will allow the stock to produce the maximum sustainable yield</i>”. The plan has within it provision to be reviewed every three years.</p> <p>The SG100 scoring issue is met and a score of 100 is provided.</p>		

References

1. COUNCIL REGULATION No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. Official Journal of the European Union L 358, 59-80.
2. COUNCIL REGULATION (EC) No 1198/2006. On the European Fisheries Fund
3. COUNCIL REGULATION (EC) No 811/2004 of 21.4.2004 establishing measures for the recovery of the Northern hake stock
4. COUNCIL REGULATION (EC) 2009/0039 establishing a long-term plan for the northern stock of hake and the fisheries exploiting that stock SEC(2009)300

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.4	Incentives for sustainable fishing The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.	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 negative 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 <u>explicitly considers incentives in a regular review of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices.</u>

Score:	90
Justification	
<p><i>SG80: Management system provides for incentives and seeks to ensure that negative incentives do not arise.</i></p> <p>Since the 2002 revision of the CFP, subsidies that contribute to unsustainable fishing have stopped. There is no support to increase capacity, or to compensate for low catches.</p> <p>There are some minor forms of subsidy which could be identified for this fishery, however, in the opinion of the assessment team these do not contribute to unsustainable fishing and are consistent with MSC principles 1 and 2. These are:</p> <ol style="list-style-type: none"> 1. The industry does not pay directly for management or science, which could be construed as a subsidy. 2. Similarly, costs of attending advisory bodies such as the RAC or Commission advisory committees are met by EU funds 3. Much of the funding for the MSC assessment process within Denmark has been made available via the European Fisheries Fund, which could be constituted as a subsidy relative to competitor fisheries elsewhere. However, the majority of European assessments have an element of public subsidy, be it from National or Regional Governments, or the EFF. 4. A preferential tax system is applied to diesel across all EU primary production sectors, which could be considered a subsidy relative to other economic sectors, but this is difficult to argue for fisheries as a whole as European countries apply a far higher level of taxation on fuel than found elsewhere, and the recent rapid escalation in oil prices has reduced the impact of this price differential for 'red' diesel. <p>The main mechanism for providing incentives via funding to the industry in Denmark is the European Fisheries Fund, EFF. The EFF was reformed in 2006, after some criticism that it was contributing to overcapacity, and the problems arising from this. Council Regulation EC 1198/2006 on the European Fisheries Fund has tightened funding restrictions to provide targeted support for improving safety and working practices, improving catch handling and quality, to encourage the adoption of low impact fishing methods and for development of shore based infrastructure to complement this. The regulation allows EFF funding to be available to reduce fishing capacity targeting stocks that are the subject of recovery or long term management plans. The Northern Hake plan itself confirms that this fishery is eligible for EFF funding.</p> <p>No detrimental subsidies, which contribute to unsustainable fishing practices have been identified for this fishery.</p> <p>At national level, the management system provides economic and social incentives for sustainable fishing. These include:</p> <ol style="list-style-type: none"> 1. Penalties for infringements / non-compliance 2. the rights based "Vessel Quota Share" system (in Danish "FKA") adopted in 2007, which has encouraged vessel owners to consolidate their catching and fishing opportunities, and done much to reduce overcapacity. The ability to pool vessel quotas has reduced quota shortage and related discards previously not uncommon in the mixed demersal fisheries in the North Sea and Skagerrak. 	

3. The Days at Sea scheme operated under the Cod Recovery Plan provides some extra fishing effort to vessels adopting more selective fishing gears. The recent, very low, take up of Cod Recovery Effort by the Danish fleet, discussed in the main body of the report, confirm how successful this consolidation has been, especially if compared to equivalent uptake within other EU Member States.

SG100:

However, *the management system does not explicitly consider incentives in a regular review.*

The most recent review of the CFP does address the question of incentives much more explicitly in particular in the form of 'results based management' and increased industry responsibility. In the consultation process, the Danish industry and ministry and taking a lead role in advocating a more results based approach to management by changing from a system of landing quotas to catch quotas to ensure that all fish caught is counted against the quota – as opposed to just those fish landed. The debate has now moved further into the mainstream, and is clearly influencing the thinking of the EU Commission. Writing off everything that is caught on the boat against the quota will in theory reduce the motivation to discard small fish and induce an incentive to fish selectively. The Danish industry is one of a number to initiate pilot studies looking at the potential using CCTV to monitor all catches (and discards) in return for an increased quota, and if successful, should also provide very good information on other issues such as bird or cetacean bycatch.

In addition to this, regulation 1198/2006 requires Member States to produce Strategic Plans, an element of which will be to review incentives for sustainable fishing. Reviews of these plans are required by the legislation to be started no later than 31st December 2011.

Due to the fact that the Danish Ministry is undertaking pioneering work in this area, the fact that the latest CFP reform goes further in addressing the question of incentives, and that the effectiveness of the EFF is to be kept under review, a further 10 points is awarded – however as there is **no** regular review which explicitly addresses incentives, SG 100 is not fully met.

A score of 90 is provided since the SG80 scoring issue is met and one component of the SG100 scoring issue is met.

References

1. COUNCIL REGULATION (EC) No 1198/2006. On the European Fisheries Fund
2. COMMISSION REGULATION (EC) No 498/2007. Laying down detailed rules for the implementation of Council Regulation (EC) No1198/2006 on the European Fisheries Fund
3. COM(2009)163 final. GREEN PAPER. Reform of the Common Fisheries Policy
4. Dalskov, J & Kindt-Larsen, L. (2009) Final report on Fully Documented Fishery. National Institute for Aquatic Resources Technical University of Denmark.
5. Ministry of Food, Agriculture and Fisheries, Denmark (2009). Paving the way for a New Common Fisheries Policy (including a joint statement by Danish, German and UK Fisheries Ministers).

3.2	Fishery- specific management system
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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.1	Fishery-specific objectives The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.	<u>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.</u>	<u>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.</u>	<u>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.</u>

Score:	80
Justification	
<p>SG80: Short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principle 1, are explicit within the fishery's management system. These include long term objectives for exploiting the stock at MSY, under sustainable economic, environmental and social conditions.</p> <p>The scoring issue is met.</p> <p>SG100:</p> <p>In addition the regulation explicitly states that there should be a progressive implementation of an ecosystem based approach to fisheries management. Long term objectives in terms of stock management are expressed in terms of target fishing mortality to achieve a stock status able to support maximum sustainable yield. The shorter term objectives to achieve these are in the form of setting TACs in line with the fishing mortality identified in the management plan, and supporting tools such as the plaice box, minimum landing sizes and mesh size regulations.</p> <p>A management plan for Hake was put in place in 2009. This has two objectives, both relating to the Hake stock, rather than wider eco-system issues. Whilst the objectives referred to above for target stock management are well defined and measurable, the objectives relating to P2 (e.g. minimising environmental impact, adoption of an ecosystem based approach) are not well defined or measurable. Scored purely on P1, the score here would be 100. However, the lack of well-defined P2 Objectives in the fisheries management system, relying instead on objectives enshrined in other legislation, for example, Natura 2000, provides an overall score of 80.</p> <p>A score of 80 is provided since the SG80 scoring issue is met and the SG100 scoring is not met.</p>	
References	
» COUNCIL REGULATION (EC) 2009/0039 establishing a long-term plan for the northern stock of hake and the fisheries exploiting that stock SEC(2009)300	

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.2	Decision-making processes The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives.	<p>There are <u>informal</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>Decision-making processes respond to <u>serious issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take <u>some</u> account of the wider implications of decisions.</p>	<p>There are <u>established</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>Decision-making processes respond to <u>serious and other important issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>Decision-making processes use the precautionary approach and are based on best available information.</p> <p><u>Explanations</u> are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>	<p>Decision-making processes respond to <u>all issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p><u>Formal reporting</u> to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>

Score:	80	
Justification		
<p><i>SG80a: There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</i></p> <p>The DG Mare of the European Commission lies at the heart of the decision making process and make proposals based on inputs from a wide consultative structure, which includes scientific advice from ICES, scientific review from STECF, industry / stakeholder review from ACFA, and direct industry input from the North Sea Regional Advisory council, as well as specific RAC Working Groups. In addition proposals, are, where relevant viewed by other Commission Directorates, including (of particular relevance to P2 considerations – DG Environment). Above all, the Commission has responsibility to ensure that proposals comply with the objectives laid out in the common fisheries policy. This same decision-making ‘machinery’ is brought to bear on fishery specific management decisions, such as the setting of TACs, technical conservation measures such as minimum, mesh size and most importantly, the determination of multi-annual plans for some critical or stocks (including harvest control rules and reference points).</p> <p>The final arbiter in the decision-making process is the Council of European Union – made up of elected representatives of member states (in the case of fishery decisions this is the fisheries ministers of each member state). It is at this level that criticism can be leveled that the political process does not ‘<i>result in measures and strategies to achieve specific fisheries objectives</i>’, when TACs or similar measures have been agreed at a political level that greatly exceed those advised. However, it is almost impossible now for Ministers to ignore firm scientific advice, and other measures are in place that limit the potential to increase quotas by more than a fixed percentage.</p> <p>The scoring issue is met.</p> <p><i>SG80 b: Decision-making processes respond to serious and other important issues</i></p> <p>The ICES working group structure, and the consultative structure built into the decision-making process (STECF / ACFA / RAC /DG environment etc) does mean that serious and other important issues are considered. Certainly latest scientific advice, and industry and social implications play key roles in shaping decisions. However, this perhaps stops</p>		

short of being all issues. In particular some of the P2 criteria, including habitats and ETP species receive less consideration in a timely, adaptive and transparent manner. However, the scoring is met since there is no explicit consideration here of separate principles.

SG80 c: Decision-making processes use the precautionary approach and are based on best available information.

Preliminary advice from ICES is that the haddock management plan uses the precautionary approach. Information provided to, and used by ICES is the best available. The agreement with Norway makes it hard for Fisheries Council to ignore this approach, and raise TACs above that recommend by the precautionary approach.

Explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

The system for transparent explanation of decision-making and resulting actions meets the fourth SG80 scoring issues but falls short of being 'formal reporting to all interested stakeholders' (as required in SG100) in a way which describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. It is possible to see details of ICES working group reports, and recommendations of STECF and ACFA (although these are less 'accessible'). It is also possible to see the outputs of the commissions' deliberations (Communications / regulations); however it is difficult for all stakeholders to derive clear explanation of the decisions that take place at the commission during the process. There is little 'non technical' reporting to the public or industry – other than generic descriptions of the regulatory bodies and processes. Furthermore, it is the Council of Ministers, at Fisheries Council, that ultimately have the ability to make decisions about management of the fishery, and very little transparent explanation is available at this level , not meeting the first SG100 scoring issue. Since the fishery meets the SG80 scoring issues and none of the SG100 scoring issues, a score of 80 is provided.

References

1. COMMISSION DECISION No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. Official Journal of the European Union L 358, 59-80.
2. COMMISSION DECISION (2004/864/EC). Amending Commission Decision 1999/478/EC of renewing the Advisory Committee on Fisheries and Aquaculture
3. COMMISSION DECISION (2005/629/EC). Establishing a Scientific, Technical and Economic Committee for Fisheries
4. http://europa.eu/institutions/decision-making/index_en.htm

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.3	Compliance and enforcement Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.	Monitoring, control and surveillance <u>mechanisms</u> exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective. Sanctions to deal with non-compliance exist and there is some evidence that they are applied. Fishers are <u>generally</u> <u>thought</u> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	A monitoring, control and surveillance <u>system</u> has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, <u>are</u> <u>consistently applied</u> and thought to provide effective deterrence. <u>Some evidence exists</u> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery. There is no evidence of systematic non-compliance.	A <u>comprehensive</u> monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, <u>are</u> <u>consistently applied</u> and <u>demonstrably</u> provide effective deterrence. There is a <u>high degree of confidence</u> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.

Score:	95	
Justification		
<p><i>SG 100a: 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.</i></p> <p>It is the responsibility of EU member states to enforce rules agreed under the CFP. An EU Community Fisheries Control Agency (CFCA) was established in 2007 to strengthen and coordinate controls across all national enforcement authorities to bring about improved uniformity and effectiveness of enforcement. This is further reinforced by the new EU control regulation which came into force on 1st January 2010, and aims to foster a new culture of compliance (1224/2009).</p> <p>In Denmark the authority responsible for MCS both at sea and on shore is the "Fiskeridirektoratet" (Directorate of Fisheries) under the Ministry of Food, Agriculture, and Fisheries. Inspections are carried out in accordance with a risk-based control strategy which commenced in 2007, which includes focus areas and campaigns (following the FAO Sampling Strategy).</p> <p>In 2009 the Fiskeridirektoratet carried out 4,300 inspections of various types, most commonly through shore based checks. Although 8.6% of these checks uncovered some sort of problem, the vast majority of these were of a minor, technical nature. The target level of at sea inspections for the Danish Directorate of the North Sea fleet (including vessels covered by this assessment is 124 inspections for gill net / long line vessels, 35 inspections for Danish Seine vessels and 120 inspections for trawl vessels.</p> <p>Although there remain some infringements in the Danish fishery, across the entire national fleet infringements do appear to be less of a problem than in other EU fleets (3% of Danish vessels in 2006 as opposed to anything up to 37% of vessels in other EU member states), with offences mostly relating to logbook infringements. The positive effects of this strategy include a reduction in the number of infringements in recent years and a constructive dialogue with the fishing industry on MCS issues. An increasing number of vessels, including 6 gillnetters in 2011, have opted to carry on board CCTV, for both discard and ETP bycatch monitoring.</p>		

This latter move may assist the Fiskerdirektoratet in dealing with cetacean bycatch and related issues. The contract between the Ministry and the Fiskerdirektoratet has 15 enforcement targets, none of which relate to ETP species. The main thrust of compliance checks relate to the 50% or so of Danish landings that contain at least some element of Cod, possibly at the expense of other areas or fisheries.

In addition to this all DFPO member vessels are required to abide by their own code of conduct, covering a wide range of compliance issues, with specific provisions relating to reporting of lost gear and catches of ETP species. This code of conduct is relatively new, and the results of these provisions to date are unknown. The enforcement system makes strategic and coordinated use of logbooks (increasingly e-logbooks), sales notes, vessels monitoring systems, designated ports, landing inspections, advance hailing of landing (in particular when landing cod), reporting tolerance limits, inspections throughout the retail and supply chain (as a result of revised buyers and sellers registration requirements in the reformed CFP). Recent improvements including the new EU IUU and Control regulations and the NEAFC Port State control rules also increase comprehensive nature of the system. This can be considered comprehensive and COM(2008) 670 demonstrates that this is consistently effective.

The first SG100 scoring issue is met.

SG100 b: Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.

In Denmark, non-compliance is dealt with through the Danish criminal justice systems, and using agreed and tested procedures. In event of an infringement being detected by the Fisheries Directorate, details of the infringement are passed to the public prosecutor, who determines the appropriate fine / sanction. This process also enables the fisher to prepare a defence against the charge and provides full right of appeal. The fisheries Directorate themselves do not therefore have unilateral power to impose sanctions – thereby ensuring the system of deterrent remains transparent, independent and consistently applied.

Within the DFPO mechanisms exist to apply sanctions to vessels that break their Code of Conduct, including the loss of MSC accreditation for fish that they land from accredited fisheries.

The second SG100 scoring issue is met.

SG100 c: 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.

Although the system appears robust and effective, as detailed above, this stops short of being *high confidence* for a number of reasons – the relatively low observer / inspections coverage, the focus of inspections (both at sea and on landing) on cod (as opposed to other species), unclear how the Danish high grading ban is enforced at sea. For example it is notable that the landings size / weight profile of vessels taking part in the Danish pilot study using video cameras onboard suggests that high grading is likely to still occur elsewhere in the fleet. Furthermore it is recognised that there is still a low level of discard sampling. However, it is recognised that the Danish Ministry is actively pushing for a solution in this areas and the DFPO Code of Conduct instruct members holding MSC certificates to avoid high grading and report systematically on observations of importance to the effective management of the fishery.

This scoring issue is not entirely met but the relevant third SG80 scoring issue is met.

SG 80 d: There is no evidence of systematic non-compliance so the fourth SG80 scoring issue is met.

A score of 95 is provided since the SG80 scoring issues are met and two the three scoring issues are met at the SG100 level.

References

1. COUNCIL REGULATION (EC) No 1224/2009. Establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005,
2. (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No
3. 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006
4. COMMISSION REGULATION (EC) No 1010/2009. Laying down detailed rules for the implementation of Council Regulation (EC)
5. No 1005/2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing
6. COM(2008) 670. COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT. Reports from Member States on behaviours which seriously infringed the rules of the Common Fisheries Policy in 2006

7. Dalskov, J & Kindt-Larsen, L. (2009) Final report on Fully Documented Fishery. National Institute for Aquatic Resources Technical University of Denmark.
8. Fiskeridirektoratet. Fiskerikontrol 2008: Inspektioner, Observationer og Kampagner , Overtrædelser

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.4	Research plan The fishery has a research plan that addresses the information needs of management.	<u>Research</u> is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2. Research results are <u>available</u> to interested parties.	A <u>research plan</u> provides the management system with a strategic approach to research and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Research results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion.	A <u>comprehensive research plan</u> provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Research <u>plan</u> and results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion and are <u>widely and publicly available</u> .

Score:	80	
Justification		
<p><i>SG80a: 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.</i></p> <p>ICES strategically establishes study groups based on information requirements identified by national delegates, including through industrial representations. Members of various ICES Working Groups focused on such elements as climate change, plankton, multi-species fisheries (ecosystem), etc. All review research, identify research requirements and undertake appropriate work. There is good communication between Working Groups (via ACOM), and between researchers through their specialist interests.</p> <p>Research / investigation is undertaken in relation to specific requirements, which generally come from the recommendations of the Stock Assessment Working Group. Members of the ICES community keep abreast of developments within the scientific community of relevance to the fishery under consideration. This ICES community is wider than Europe and includes relevant research elsewhere. Research contracts are left to other organisations, including Universities, (e.g. through the EC) to supplement scientific understanding relevant to the fishery and related ecosystem. In Denmark, DTU Aqua plays a key role in the work of ICES, and is the formal representative of Denmark on ICES working groups and, as such, contributes significant resources and expertise to relevant research.</p> <p>For example, a number of key ICES working / study group have particular bearing on the fishery under assessment. These include (but are not limited to):</p> <ol style="list-style-type: none"> 1. WGWDMS - Working Group on Widely Distributed and Migratory Stocks 2. WGRES - Working Group for Regional Ecosystem Description 3. REGNS - Regional Ecosystem Study Group for the North Sea <p>_This scoring issue is met.</p> <p>SG100 a: Though there is no "<u>comprehensive</u>" <u>research plan</u> that provides the management system with a coherent and strategic approach to research across P1, P2 and P3, a large number of national projects are looking at issues across all 3 principles. It can therefore be concluded that there is a strategic approach that delivers reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Furthermore, input by the catching sector to assist with development of this plan does not appear to be "proactive".</p> <p>This scoring issue is not met.</p> <p><i>SG80 b: Research results are disseminated to all interested parties in a timely fashion.</i></p> <p>The annual reports of ICES working groups and study groups are publically available on the ICES website. In addition they are disseminated to interested parties in a timely fashion – in particular they are disseminated to decision-makers, in time for annual fishery allocation negotiations. Fishing industry representatives are also able to discuss the reports with scientists, as well as provide input prior to their publication. However, this stops short of being widely and publically available, as the results are not presented in an accessible form (easy to find), to enable all interested parties (including</p>		

public / consumers) to quickly interpret the findings – without significant prior knowledge or expertise. The second SG80 scoring issue is met but the second SG100 scoring issue is not met.

A score of 80 is provided since the SG80 scoring issues are met and none of the SG100 scoring issues are met.

References

- » <http://www.aqua.dtu.dk/english.aspx>
- » Searchable hub for all ICES expert groups: <http://www.ices.dk/workinggroups/WorkingGroups.aspx>

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.5	Monitoring and management performance evaluation There is a system for monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.	The fishery has in place mechanisms to evaluate <u>some</u> parts of the management system and is subject to <u>occasional internal</u> review.	The fishery has in place mechanisms to evaluate <u>key</u> parts of the management system and is subject to <u>regular internal</u> and <u>occasional external</u> review.	The fishery has in place mechanisms to evaluate <u>all</u> parts of the management system and is subject to <u>regular internal</u> and <u>external</u> review.

Score:	90	
Justification		
<p><i>SG100: The fishery has in place mechanisms to evaluate key parts of the management system and is subject to regular internal and occasional external review.</i></p> <p>There is a comprehensive system of routine monitoring of information relevant for management decision-making and stock assessment purposes. The monitoring programme in place principally focuses on landings from the fishery, i.e. quota uptake, and associated discards at sea. Due to the systems described in 3.2.3 this monitoring now forms a substantially more accurate reflection of actual fishing mortality. Additional monitoring is also in place to provide sufficient information to support stock assessment purposes (for example length / weight monitoring).</p> <p>High quality, well-documented procedures exist to reduce harvest in light of monitoring results. These can be quickly implemented (near real-time recording of catch levels and quota uptake – and annual review of stock status). The CFP system allows the Commission to make a proposal to the Council for an immediate (in-year) reduction in quota. Additionally there is a well established system to of management evaluations. For example, there have been a number of directly relevant evaluations of the management system. These include:</p> <ol style="list-style-type: none"> 1. Review of the CFP (2002 & 2008 -) 2. Annual Report on Fishing Fleet Capacity – Denmark 3. The ICES Working Groups (referred to in 3.2.4) also effectively serve as routine evaluations of management performance, by comparing fishery performance to pre-determined targets. <p>The Hake management plan has provision for periodic review every third year. In addition, ICES was asked by the European Commission in 2010 asked to provide updated advice on the targets within the management plan, this in response to an earlier review of the stock assessment methodology. The plan also requires Member States to report annually on the success of control measures within the fishery, and requires ACFA to meet at least once a year to discuss and evaluate these annual reports/.</p> <p>The majority of the evaluations undertaken are 'internal' either within ICES or the EC. However, ICES work brings together a wide range of national scientists, in so doing so builds external perspectives into the assessments, as well as provide a much greater degree of confidence in the catch and discard figures used in the assessments. This work is periodically externally reviewed. However, this stops short of regular external review, therefore the 100 SG is not met. However, as the evaluations appear comprehensive and go further than just 'key' evaluations, a further 10 points is awarded.</p> <p>The SG100 scoring issue is partially met and a score of 90 is provided.</p>		

References

1. ICES stock report 2010 volume 9 9.3.2.1 Advising on measures within the Hake recovery plan
2. COUNCIL REGULATION (EC) 2009/0039 establishing a long-term plan for the northern stock of hake and the fisheries exploiting that stock SEC(2009)300

Appendix 4 – Peer review reports

Peer Reviewer A

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Certification Body Response
<u>Justification:</u> This is a very detailed and thorough review and I believe that the assessment team has arrived at an appropriate conclusion regarding this fishery.		Noted.

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes	Certification Body Response
<u>Justification:</u> Yes, the conditions specified are clear and concise and will put the fishery in a good position for achieving the SG80 outcome within the timeframe specified.		Noted.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes	Certification Body Response
<u>Justification:</u> The client action plan appears to be very brief. I am interpreting it to imply that they will carry out all actions as specified under the suggested actions raised under each condition. It would be better, though, if these actions could be spelled out explicitly in the client action section.		The client has been asked to provide a detailed action plan that explicitly addresses the conditions along the lines indicated.

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.	Certification Body Response
1.1.1	Yes	Yes	NA	SSB seems headed in a positive direction.	No further response required.
1.1.2	Yes	Yes	Yes	Perspective on the stock has changed making the available biological reference points obsolete. Reference points should be recalculated.	No further response required.
1.1.3	NA	NA	NA	Stock appears to have fully recovered.	No further response required.
1.2.1	Yes	Yes	NA	Harvest strategy has been fully explored and seems to be working.	No further response required.
1.2.2	Yes	Yes	Yes	Again, control rules seem well defined if currently obsolete. Control rules might be redefined under new paradigm.	No further response required.
1.2.3	Yes	Yes	NA	Monitoring seems consistent with management needs.	No further response 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.	Certification Body Response
1.2.4	Yes	Yes	NA	The assessment seems more appropriate than previous assessments. Still, caution might be exercised in the face of a new procedure being applied. If the findings were in the opposite direction I'm sure that much greater scrutiny would be applied.	No further response required.
2.1.1	Yes	Yes	Yes	Some liason with management entities to address nephrops bycatch seems appropriate.	No further response required.
2.1.2	Yes	Yes	Yes	Some liason with management entities to address anglerfish bycatch seems appropriate.	Agreed.
2.1.3	Yes	Yes	NA	Sufficient information available.	Agreed.
2.2.1	Yes	Yes	NA	Information sufficient to suggest no harm.	Agreed.
2.2.2	Yes	Yes	NA	Bycatch management seems adequate.	Agreed.

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.	Certification Body Response
2.2.3	Yes	Yes	Yes	Scores seem to differ between Ap. 3 (85) and Conditions Table (75), which may be due to the consideration of the longline fishery... which might be removed from the certification. Just noting the inconsistency.	This has been checked and amended where necessary
2.3.1	Yes	Yes	Yes	Scores seem to differ between Ap. 3 (85) and Conditions Table (75). Not sure why this is so here. Yes, Code of Conduct data should be verified and verifiable.	This has been checked and amended where necessary
2.3.2	Yes	Yes	Yes	Bycatch monitoring for harbor porpoise should be strengthened.	Agreed.
2.3.3	Yes	Yes	Yes	Implement fully terms of Code of Conduct.	Agreed.
2.4.1	Yes	Yes	Yes	Implement on-board recording and spatial plan.	Agreed.
2.4.2	Yes	Yes	NA	Habitat protection strategy seems adequate.	Agreed.

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.	Certification Body Response
2.4.3	Yes	Yes	NA	Habitat monitoring adequate to detect harmful changes.	Agreed.
2.5.1	Yes	Yes	NA	Ecosystem function seems to be well understood and top predator hake harvest levels appear reasonable.	Agreed.
2.5.2	Yes	Yes	NA	Strategies to protect the ecosystem seem to be in place and functional.	Agreed.
2.5.3	Yes	Yes	NA	Systems for monitoring ecosystem risks seem adequate.	Agreed.
3.1.1	Yes	Yes	NA	Management seems consistent with how one does these things.	Agreed.
3.1.2	Yes	Yes	NA	Responsibilities are well defined and documented.	Agreed.
3.1.3	Yes	Yes	NA	Long-term objectives are clear.	Agreed.

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.	Certification Body Response
3.1.4	Yes	Yes	NA	Positive incentives for sustainable fishing are in place.	Agreed.
3.2.1	Yes	Yes	NA	Fishery-specific objectives are clearly specified.	Agreed.
3.2.2	Yes	Yes	NA	Decision-making processes necessary to achieve objectives are in place.	Agreed.
3.2.3	Yes	Yes	NA	Monitoring for compliance and effective enforcement seem to be in place and time tested.	Agreed.
3.2.4	Yes	Yes	NA	A research plan is available.	Agreed.
3.2.5	Yes	Yes	NA	The system has in place a wide variety of mechanisms for evaluating the performance of management actions.	Agreed.

Any Other Comments

Comments	Certification Body Response
A very detailed and thorough analysis. I enjoyed reading through this review.	Noted.

Peer Reviewer B

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Certification Body Response
<u>Justification:</u> <p>The report was comprehensive and consistent with MSC Principles and Criteria. Weaknesses were identified and recommendations were made to rectify them. Stakeholder consultations were made and incorporated. Overall conclusion to certify stock is appropriate based on evidence presented in report.</p>		Noted.

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes	Certification Body Response
<u>Justification:</u> <p>Condition 1 (PI 1.1.2) and 2 (PI 1.2.2) would be resolved by updating report to include the 2014 benchmark and subsequent assessment that provided biological reference points. Realistic four years plans are proposed to resolve the status and management of retained species in conditions 3 (PI 2.1.1) and 4 (PI 2.1.2). Increased onboard observer coverage and compulsory reporting of ETP by-catch should resolve issues for set nets outlined in condition 5 (PI 2.2.3) and 6 (PI 2.3.1). Conditions 7 (PI 2.3.2) and 8 (PI 2.3.3) relate to uncertainty in management and information on ETP species. The solution proposed is to record and report all catches of ETN species. However this may highlight the ETP problem as opposed to resolve it. Nevertheless the problem must be clearly identified first and this is an appropriate response over next two years. Condition 9 (PI 2.4.1 and PI 2.4.2) relates to status and management of habitat. A four year plan is proposed to increase onboard observer coverage. As an observer program can never cover more than a few percent of entire fishery I would also suggest the analysis of VMS data to identify encounters with sensitive habitats. However, if such encounters cannot be avoided or reduced then closed areas must be considered.</p>		No further response required.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes	Certification Body Response
<u>Justification:</u> <p>See above section.</p>		No further response 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.	Certification Body Response
1.1.1	Yes	Yes	NA	The certifier gave a score of 90 for this PI. This is correct as it is highly likely that the stock is above the point where recruitment would be impaired (SG80) however previous target reference points (SG100) are invalid as the assessment methodology was changed to a length based model in 2010.	No further response required.
1.1.2	Yes	Yes	Yes	The certifier gave a score of 75 for this PI. This is correct as target reference points exist (SG60) however they are invalid since 2010.	No further response required.
1.1.3	NA	NA	NA	Stock is not depleted (PI 1.1.1)	No further response required.
1.2.1	Yes	Yes	NA	The certifier gave a score of 90 for this PI. This is correct as the harvest strategy is in place and is achieving its objectives (SG80) however the objectives cannot be reflected in the target reference points (SG100).	No further response 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.	Certification Body Response
1.2.2	Yes	Yes	Yes	The certifier gave a score of 75 for this PI. This is correct as the harvest control rules are in place and consistent with harvest strategy (SG60) however they cannot be shown to control the exploitation rate relative to limit reference points (SG80).	No further response required.
1.2.3	Yes	Yes	NA	The certifier gave a score of 80 for this PI. This is correct as sufficient information is collected to support the harvest strategy and is monitored regularly (SG80). There is also information on all other fishery removals from the stock (i.e. Discards). However the information is not comprehensive or monitored with high enough regularity or accuracy to merit SG100.	No further response required.
1.2.4	Yes	Yes	NA	The certifier gave a score of 90 for this PI. This is correct as the 2010 SS3 length based assessment is appropriate for the stock and the harvest control rule. It also takes uncertainty into account and is	No further response 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.	Certification Body Response
				subject to peer review. However, the assessment does not evaluate stock status relative to reference points in a probabalistic way (SG100).	
2.1.1	Yes	Yes	Yes	The certifier gave demersal trawl (TR2) a score of 75 which is correct as retained species cannot be shown to be within biological limits. However, there are management measures in place to ensure that recovery is not impaired. Demersal trawl (TR1), Danish Seine and Set nets were scored 85 as there is a high degree of certainty that species retained using these gears are within biological limits. SG100 is not merited as target reference points are invalid (SG100).	No further response required.
2.1.2	Yes	Yes	Yes (TR1 And TR2)	Demersal trawls (TR1 and TR2) were scored 75 as there are effective management measures in place (e.g. technical gear restrictions) however there was no evidence that such measures achieve objectives (SG80). Danish	No further response 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.	Certification Body Response
				Seine and set nets scored 80 and 85 respectively as there is a partial strategy in place that has some objective basis. SG100 was not merited for these gears as there is insufficient confidence that the strategy will work.	
2.1.3	Yes	Yes	NA	Demersal trawls (TR1 and TR2) and Danish Seines were scored 80. This is correct as there is qualitative and quantitative information available for retained species that is sufficient for assessment and to support the partial management strategy. Also any increase in risk to retained species should be detected by available information. Set nets were scored 90 as they catch mostly hake and cod which have a large quantity of high quality data associated.	No further response required.
2.2.1	Yes	Yes	NA	All gears (Demersal trawls, Danish seines and set nets) were scored 80. This is correct as the main by-catch species (Nephrops, cod, plaice and dab) are likely to be	No further response 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.	Certification Body Response
				within safe biological limits. Also measures such as Norwegian discard ban and EU High grading ban will not hinder stock recovery.	
2.2.2	Yes	Yes	NA	Demersal trawl (TR2) was scored 80. This is correct as there are partial management strategies in place for this gear (selectivity devices) which are expected to maintain by-catch species within safe biological limits. Demersal trawl (TR1) and Danish Seine scored 95 while set nets scored 85 as there is confidence that the strategies (cod management plan, highgrading and discard bans) applied to these gears will achieve objectives to mitigate by-catch.	No further response required.
2.2.3	Yes	Yes	NA	Demersal trawls (TR1 and TR2) and Danish Seines were scored 85. This is correct as there is qualitative and quantitative information available from vessels and on-board observers for by-catch species that is sufficient for assessment and	No further response 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.	Certification Body Response
				partial management strategy. Also any increase in risk to by-catch species should be detected by available information. Set nets scored 75. This is correct as there is uncertainty regarding bycatch in this gear.	
2.3.1	Yes	No	Yes (Set nets)	Demersal trawls (TR1 and TR2) and Danish Seines were scored 80. This is correct as the status of ETP species caught by these gears are known and likely to be within protection requirements. Also the direct and indirect effects are unlikely to create unacceptable impacts. Set nets were scored 75. This score is incorrect given that in 2008 ICES were unable to provide a complete by-catch estimate of harbour porpoise by set nets. Conditions raised may or may not show problematic bycatch and this will not be known until observer coverage is increased.	We agree that ICES has been unable to provide a complete bycatch estimate for Harbour porpoise, and it has not been possible to state whether the fishery is meeting international requirements for the protection of Harbour porpoise in the North Sea. Though the Danish Plan for the conservation of Harbour porpoise (Anon., 2005) considers that the total by-catch of harbour porpoises for all fisheries in the North Sea is unsustainable, it is likely that the current Harbour porpoise bycatch rates are highly likely to be much lower than this (due to decommissioning and a large reduction in effort). The score of 75 reflects this uncertainty, and is consistent with other North Sea set net fisheries' scores.

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.	Certification Body Response
2.3.2	Yes	Yes	Yes	All gears (Demersal trawls, Danish seines and set nets) were scored 75. This is correct as there are by-catch mitigation measures in place that are likely to protect ETP species. SG80 was not merited as objective evidence is forthcoming.	No further response required.
2.3.3	Yes	Yes	Yes	All gears (Demersal trawls, Danish seines and set nets) were scored 70. This is correct as there is qualitative and quantitative information available from vessels and on-board observers for ETP species. However this information is insufficient to support a full strategy to manage impacts on ETP species.	No further response required.
2.4.1	Yes	Yes	Yes (TR1 and TR2)	Demersal trawls (TR1 and TR2) were scored 75. The trawl fishery is conducted in shallows waters of the Skagerrak where it is unlikely to cause serious or irreversible harm to habitat (SG60). Rationale for SG75 score is based on VMS data. Danish seines scored 80 as ropes have some seabed interactions but are	No further response 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.	Certification Body Response
				highly unlikely to cause serious or irreversible harm (SG80). Set nets scored 90 as there is some evidence that the habitat will not suffer irreversible harm.	
2.4.2	Yes	Yes	Yes	Demersal trawls (TR1 and TR2) were scored 75. The demersal trawl fishery operates a partial strategy to minimise the impact on seabed habitats and use of VMS data to protect sensitive seabed habitats. Danish seines and set nets were scored 80 and 85 respectively as there is some objective basis for believing that partial strategy will achieve objectives.	No further response required.
2.4.3	Yes	Yes	NA	Demersal trawls (TR1 and TR2) and Danish seines scored 80 while set nets scored 85. These are correct as the information on seabed habitat is available at a scale relevant to the fishery and is adequate for	No further response 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.	Certification Body Response
				qualitative assessment of impact. Also monitoring is sufficient to detect any increase in habitat risk.	
2.5.1	Yes	Yes	NA	All gears (Demersal trawls, Danish seines and set nets) were scored 90. This is correct as there is some evidence that the fishery using these gears is highly unlikely cause serious or irreversible harm to ecosystem.	No further response required.
2.5.2	Yes	Yes	NA	All gears (Demersal trawls, Danish seines and set nets) were scored 90. This is correct as there is a management plan in place with some evidence that it is implemented and will achieve objectives. There are a number of conventions and European directives in place (e.g. OSPAR, ASCOBANS etc.) that aim to protect and conserve the ecosystem. In addition the DFPO have implemented a code of conduct for all MSC certified vessels.	No further response 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.	Certification Body Response
2.5.3	Yes	Yes	NA	All gears (Demersal trawls, Danish seines and set nets) were scored 90. This is correct as the quality of the information available is such that fishery impacts on ecosystem have been investigated and the main ecosystem functions of fishery components are known. Also information is sufficient to infer potential impacts on ecosystem of changes to fishery components. Finally information is monitored regularly so that changes to risk level can be detected.	No further response required.
3.1.1	Yes	Yes	NA	The certifier gave a score of 85 for this PI. This is correct as there are effective national (1999 Danish Fisheries Act) and international (EU CFP) legal systems which can deliver management outcomes consistent with MSC principles. Also the management systems have transparent mechanisms for resolution of legal disputes.	No further response 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.	Certification Body Response
3.1.2	Yes	Yes	NA	The certifier gave a score of 80 for this PI. This is correct as the management system is explicitly defined and well understood by involved individuals and organisations (Danish Agrifish, DFPO, RAC etc.). The management system also incorporates relevant information (ICES) and the consultation process provides an opportunity for all parties to become involved.	No further response required.
3.1.3	Yes	Yes	NA	The certifier gave a score of 100 for this PI. This is correct as clear long term objectives are required by EU CFP. These objectives are consistent with MSC principles and incorporate the precautionary approach. The DFPO code of conduct also includes long term objectives that are consistent with MSC principles.	No further response required.
3.1.4	Yes	No	NA	The certifier gave a score of 90 for this PI. This is incorrect as the incentives for discarding and	The main focus of this PI is whether economic and social incentives exist for sustainable fishing

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.	Certification Body Response
				highgrading still exist. It is hoped that the 'Landings Obligation' will address these problems, however it is unclear how this will be achieved in practice. The move to individual vessel quotas in 2007 by DFPO is a welcome development and may merit SG80.	and it assesses the degree that subsidies contribute to unsustainable fishing. The assessment team maintains that the fishery meets the first clause of the SG100 scoring issue in that at the national level the vessel quota share system with its associated ability to pool vessel quotas is a significant step toward reducing discards in this fishery. We also note the days-at-sea scheme under the Cod Recovery Plan provide incentives to move toward more selective fishing gear. The second part of the SG100 clause is not met, since there is no review of management policy that explicitly considers incentives on a regular basis. This performance indicator deals with higher level governance issues not specific to the fishery under assessment. In this context, the score is appropriate. We conclude the appropriate score is 90.
3.2.1	Yes	Yes	NA	The certifier gave a score of 80 for this PI. This is correct as the fishery has explicit short and long term objectives that are consistent with MSC principles.	No further response 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.	Certification Body Response
3.2.2	Yes	Yes	NA	The certifier gave a score of 80 for this PI. This is correct as the decision making processes of CFP achieve fishery specific objectives and are responsive to serious and other important issues (STECF). Also the precautionary approach is incorporated into decision making process and are based on best information. Finally, fishery performance and management actions are available on request.	No further response required.
3.2.3	Yes	Yes	NA	The certifier gave a score of 95 for this PI. This is correct as there is a high degree of control and enforcement in the Danish fisheries sector. Fisheries are monitored closely to ensure that there is compliance with management. Sanctions are applied where necessary and have been shown to be effective (DFPO Code of Conduct).	No further response required.
3.2.4	Yes	Yes	NA	The certifier gave a score of 80 for this PI. This is correct as the	No further response 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.	Certification Body Response
				research plan for this fishery provides management with information that is consistent with MSC principles. Results from research plan are also delivered to all interested organisations and individuals.	
3.2.5	Yes	Yes	NA	The certifier gave a score of 90 for this PI. This is correct as key components of the management system are evaluated internally and externally (ICES, STECF).	No further response required.

Any Other Comments

Comments	Certification Body Response
This stock had a benchmark in February 2014 (ICES WKSOUTH). The benefit of this benchmark was that a full analytical assessment was carried out at	No further response required.

WGBIE in May 2014 and SSB, fishing mortality and recruitment were estimated. Reference points (F_{MSY} , MSY , $B_{trigger}$, B_{lim} and B_{pa}) were also proposed by the WG. The incorporation of these developments into the report would improve the scoring in Principle 1.

Appendix 5 – Stakeholder Input received prior to PCDR

a. Written submissions from stakeholders received during consultation opportunities on the announcement of full assessment, proposed assessment team membership, proposed peer reviewers, proposal on the use or modification of the FAM and use of the RBF.

None.

b. All written and a detailed summary of verbal submissions received during site visits pertaining to issues of concern material to the outcome of the assessment³ regarding the specific assessment.

None.

c. Explicit responses from the assessment team to submissions described in **a.** and **b.** above.

None

Appendix 6 – Amendments made to the PCDR following the 30 day consultation period

Details to be added at FR (Final Report) stage