Food Certification International Ltd

Findhorn House
Dochfour Business Centre
Dochgarroch
Inverness IV3 8GY
United Kingdom

T: +44(0)1463 223 039
F: +44(0)1463 246 380

Specialist assurance for
the fisheries and aquaculture sectors

www.foodcertint.com

MSC SUSTAINABLE FISHERIES CERTIFICATION

Danish and Swedish Nephrops Fisheries (Swedish)

Public Comment Draft Report

May 2014

Prepared For: **Fiskeri AB Ginneton/Gothenberg Fish Auction**

Prepared By: **Food Certification International Ltd**

CERTIFIED SUSTAINABLE SEAFOOD MSC www.msc.org

Public Comment Draft Report

May 2014

Authors: Rod Cappell, Julian Addison, Lucia Revenga, Veronica Sund

Certification Body:

Food Certification International Ltd

Address:

Findhorn House

Dochfour Business Centre

Dochgarroch

Inverness IV3 8GY

Scotland, UK

Name: Fisheries Department

Tel: +44(0) 1463 223 039

Email: fisheries@foodcertint.com

Web: www.foodcertint.com

Client:

Fiskeri AB Ginneton/Gothenberg Fish Auction

Address:

Camparus AB, Rodergatan 7

SE-456 50 Smögen

Sweden

Name: Bengt Gunnarson

Tel: +46 705 36 55 01

Email: bengt.gunnarsson@telia.com

Contents

1. Executive Summary 1
2. Authorship and Peer Reviewers 3
2.1 Assessment Team 3
2.1.1 Peer Reviewers 4
2.1.2 RBF Training 5
3. Description of the Fishery 6
3.1 Unit(s) of Certification and scope of certification sought 6
3.1.1 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF) 7
3.2 Overview of the fishery 8
3.2.1 Fiskeri AB Ginneton/Gothenberg Fish Auction 8
3.2.2 Species and Fishing Practice 8
3.3 Principle One: Target Species Background 13
3.3.1 Nephrops fishery resources and life history 13
3.3.2 Status of stocks 14
3.3.3 History of fishing and management 24
3.4 Principle Two: Ecosystem Background 25
3.4.1 Retained catch 29
3.4.2 Bycatch 38
3.5 Principle Three: Management System Background 53
4. Evaluation Procedure 57
4.1 Harmonised Fishery Assessment 57
4.1.1 Harmonisation Details 57
4.2 Previous assessments 57
4.3 Assessment Methodologies 57
4.3.1 Assessment Tree 57
4.4 Evaluation Processes and Techniques 58
4.4.1 Site Visits 58
4.4.2 Consultations 59
4.4.3 Evaluation Techniques 60
5. Traceability 62
5.1 Eligibility Date 62
5.2 Traceability within the Fishery 62
5.2.1 Description of Tracking, Tracing and Segregation Systems within the Fishery and Management systems in place relating to Traceability 62
5.2.2 Evaluation of Risk of Vessels Fishing Outside of UoC 62
5.2.3 Risk of Substitution of Mixing Certified / Non-Certified Catch prior to point of landing 63
5.2.4 At-Sea Processing 63
5.2.5 Trans-Shipment 63

5.2.6 Robustness of management systems relating to traceability 63
5.3 Eligibility to Enter Further Chains of Custody 63
5.3.1 Eligible points of landing 63
5.3.2 Parties eligible to use the fishery certificate 63
5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody 63
6. Evaluation Results 64
6.1 Principle Level Scores 64
6.2 Summary of Scores 64
6.3 Summary of Conditions 65
6.3.1 Recommendations 65
6.4 Determination, Formal Conclusion and Agreement 65
7. References 66

Appendix 1. Scoring & Rationale 72
Appendix 1a – MSC Principles & Criteria 72
Appendix 1.1 Performance Indicator Scores and Rationale 75
Appendix 1.2 Risk Based Framework (RBF) Outputs 336
Appendix 1.3 Conditions 337
Condition 1 337
Condition 2 338
Condition 3: For UoC 1, 2, 3 and 4. 339
Appendix 2. Peer Review Reports 341
Peer Reviewer 1 341
Peer Reviewer 2 362
Appendix 3. Stakeholder submissions 374

Glossary

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
Bpa	Precautionary reference point for spawning stock biomass
Blim	Limit biomass reference point, below which recruitment is expected to be impaired.
CFP	EU Common Fisheries Policy
CR	Council Regulation
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened and protected species
EU	European Union
F	Fishing Mortality
Flim	Limit reference point for fishing mortality that is expected to drive the stock to the biomass limit
Fpa	Precautionary reference point of fishing mortality expected to maintain the SSB at the precautionary reference point
FAM	MSC's Fisheries Assessment Methodology
FAO	United Nations Food and Agriculture Organisation
HCR	Harvest Control Rule
ICES	International Council for the Exploration of the Sea
ITQ	Individual Transferable Quota
MCS	Monitoring, Control and Surveillance
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
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
SI	Scoring Issue (MSC)
SONAR	Sound navigation and ranging
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
UK	United Kingdom
UoC	Unit of Certification
UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessel Monitoring System
VPA	Virtual Population Analysis
WWF	World Wide Fund For Nature
WGRED	ICES Working Group on Ecosystem Description

1. Executive Summary

» This report provides details of the MSC assessment process for the Danish and Swedish Nephrops Fisheries (Swedish) fishery for Fiskeri AB Ginneton/Gothenberg Fish Auction. The assessment process began in May, 2013 and was concluded (to be determined at a later date).

» 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 1.1** of this report.

» The **Target Eligibility Date** for this assessment is 31 December, 2013.

The assessment team for this fishery assessment comprised of Rod Cappell, who acted as team leader and primary Principle 3 specialist; Julian Addison who was primarily responsible for evaluation of Principle 1, Lucia Revenga who was primarily responsible for evaluation of Principle 2 and Veronica Sund who was the Local Expert.

Client strengths

» The fishery benefits from comprehensive assessment, management and enforcement systems.

Client weaknesses

» The introduction of the Seltra trawl has achieved its objective of reducing the cod catch, but significant quantities of other non-target species are caught and some of these are not adequately managed.

» The management of the impact of trawling on habitats is limited and some spatial restrictions have been removed for selective gears where they related to cod avoidance rather than habitat.

Determination

On completion of the assessment and scoring process, the assessment team concluded that Swedish vessels targeting Nephrops with demersal trawl using the Swedish grid, and the Seltra trawl in both the Skagerrak and Kattegat and Swedish vessels targeting Nephrops with creel in the Skagerrak and Kattegat achieved the required standard and should be certified by the MSC.

Rationale

» There are a number of areas which reflect positively on the fishery:

› The fishery is assessed as a single functional unit and this, in contrast to many other Nephrops fisheries, is consistent with the setting of quota for the fishery.

› There is a comprehensive management system for the fishery with effective enforcement.

Conditions & Recommendations

» However, a number of criteria that contribute to the overall assessment score scored less than the unconditional pass mark, and therefore trigger a binding condition to be placed on the fishery, which must be addressed in a specified timeframe (within the 5 year lifespan of the certificate). A full explanation of these conditions is provided in **Section 1.3** of the report, but in brief, the areas covered by these conditions are:

› The definition of limit reference points for the Nephrops fishery in IIIa.

› Well-defined harvest control rules taking into account the main uncertainties

› Improved gear selectivity and/or management of some retained and by-catch species

› Better mapping and managing of the fishery in relation to sensitive habitats

For interested readers, the report also provides background to the target species and fishery covered by the assessment, the wider impacts of the fishery and the management regime, supported by full

details of the assessment team, a full list of references used and details of the stakeholder consultation process.

FCI Ltd confirms that this fishery is within scope.

2. Authorship and Peer Reviewers

2.1 Assessment Team

All team members listed below have completed all requisite training and signed all relevant forms for assessment team membership on this fishery.

Assessment team leader: Rod Cappell

Primarily responsible for assessment under Principle 3

Rod Cappell is Director with Poseidon based in Northern Ireland and has over 18 years of experience in the maritime sector. Rod holds degrees in marine biology, marine resource development and a post-graduate qualification in environmental economics.

Recent UK work includes a review of the Green Paper and CFP reform proposals for the Scottish Government's Inquiry into Future Fisheries Management and exploring economic approaches to reform of the English inshore sector for Defra under the SAIF programme. He is currently holding workshops around Northern Ireland exploring the management of inshore crab fisheries. Rod has also worked on a variety of European fisheries projects this year including project managing a review of effort management in a number of Member States and contributing to Regulatory Impact Assessments of numerous EC policies, including CFP reform.

Rod's MSC experience has included a variety of UK and European fisheries at pre-assessment and main assessment level. He has recently completed the certification process for a Dutch fishing company targeting North Sea plaice and is currently lead auditor for a nationwide assessment of key Dutch fisheries. Rod is working on a large assessment of Bay of Bengal pelagic fisheries based on the MSC standard where fisheries improvement plans will be developed and. He is also contributing to a global overview of environmental gains achieved by MSC fisheries for the Marine Stewardship Council.

Expert team member: Julian Addison

Primarily responsible for assessment under Principle 1

Dr Julian Addison is an independent fisheries consultant with 30 years' experience of stock assessment and provision of management advice on shellfish fisheries, and a background of scientific research on shellfish biology and population dynamics and inshore fisheries. Until December 2010 he worked at the Centre for Environment, Fisheries and Aquaculture Science (Cefas) in Lowestoft, England where he was Senior Shellfish Advisor to Government policy makers, which involved working closely with marine managers, legislators and stakeholders, Government Statutory Nature Conservation Organisations and environmental NGOs. He has also worked as a visiting scientist at DFO in Halifax, Nova Scotia and at NMFS in Woods Hole, Massachusetts where he experienced shellfish management approaches in North America. For four years he was a member of the Scientific Committee and the UK delegation to the International Whaling Commission providing scientific advice to the UK Commissioner. He has worked extensively with ICES and was Chair of the Working Group on the Biology and Life History of Crabs, a member of the Working Group on Crangon Fisheries and Life History and a member of the Steering Group on Ecosystems Function. He has undertaken MSC full assessments for the Newfoundland and Labrador snow crab fishery, the Ireland and Northern Ireland bottom grown mussel fisheries, and both the Estonia and Faroe Islands Barents Sea cold water prawn fisheries. He is also currently undertaking various MSC pre-assessments and has carried out peer reviews of MSC assessments in both Europe and North America of lobster, cold water prawn, razorfish, cockle and scallop fisheries. Other recent work includes a review of the stock assessment model for blue crabs in Chesapeake Bay, USA, and an assessment of three Alaskan crab fisheries under the FAO-based Responsible Fisheries Management scheme.

Expert team member: Lucia Revenga

Primarily responsible for assessment under Principle 2

Lucia Revenga is a marine scientist, specialized in Fisheries Biology. She holds degrees in both Marine Sciences and Environmental Sciences from the University of Cadiz in Spain.

Between 2005 - 2010 she worked with TRAGSA for the Spanish General Marine Secretariat, the Spanish Institute of Oceanography and the Canary Islands Marine Sciences Institute, conducting research and writing reports concerning the biology and stock status of different species, studying and analysing the catch composition and population of the stocks, the species biology (sex and maturity), as well as reporting all the information concerning retained species. She has worked with different species (bluefin tuna, skipjack tuna, albacore, mackerel, sardine, eel, scarlet shrimp, prawn, Norway lobster, sole, halibut, hake, seabream), on board fishing vessels using different fishing gears (bottom trawlers, tuna traps and artisanal fleet) in Atlantic waters (NAFO area and Moroccan and Spanish waters). She has worked closely with different stakeholders, including fishermen, shipowners, institutional partners and the scientific community. She has also taken part in oceanographic surveys focused on the search of vulnerable marine ecosystems, sampling benthic habitats of deep water canyons.

Since 2011 she has been working for IFAPA (Institute for Research and Training in Fisheries) as a Fisheries biology teacher for skippers, and has also conducted research on local fishery activities trying to increase community awareness of the conservation of coastal ecosystems and encouraging sustainable fishing practices. Previously she has worked as a teacher and specialist in environmental issues related to the ISO-14000 and ISO-9000 norms.

Expert advisor: Veronica Sund

As a Marine Biologist at SIK The Swedish Institute for Food and Biotechnology I have worked with Life Cycle Assessments (LCAs) of seafood, including fisheries, for 4 years. Other work tasks include presentations at International conferences in the field as well as environmental educations for companies.

I have experience from MSC assessments from the surveillance of 'Astrid fiske' herring fishery (2011) from which I have good understanding of the MSC principles and Criteria for Sustainable Fishing, MSC Fisheries Certification Methodology and MSC Chain of Custody Standard and Methodology. I have also participated in MSC workshops and a workshop on traceability of eco-labelled seafood.

I am a member of the Swedish eco-label KRAV's fishery expert committee, where I assessed 10-15 fisheries in 2010 and 2011 (ongoing work in 2012). Stock evaluations are a central part of the work, primarily on Norwegian and Swedish fisheries. The KRAV work has contributed to my knowledge and skills regarding the local conditions in these fisheries. I am experienced in interpreting scientific fishery assessments and advice, as well as assessing fishery managements. I have good understanding of the management systems used in fisheries in the Northeast Atlantic region.

I studied Marine Ecology at Gothenburg University (2005-2008). My bachelor thesis was an environmental assessment of two seafood products from fisheries producing two inter-exchangeable products from cod and Alaska pollock. The thesis included an LCA and an evaluation of the ecosystem impacts of the fisheries, regarding state of target species stocks, by-catch and discard situation (http://www.sik.se/archive/pdf-filer-katalog/SR799.pdf).

2.1.1 Peer Reviewers

Peer reviewers used for this report were Andy Hough and Oliver Tully. A summary CV for each is available in the **Assessment downloads** section of the fishery's entry on the MSC website.

Justification to be added here (by FCI) as to why these particular peer reviewers were appointed - to be framed in terms of their specific areas of expertise relevant to this particular fishery and why they

will be in a position to provide expert reviews to ensure the scores and rationales given by the assessment team have taken account of all the available information and can be scientifically justified.

2.1.2 RBF Training

RBF was not used for this fishery assessment.

3. Description of the Fishery

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

Food Certification International Ltd confirm that the fishery is within scope of the MSC certification sought for the assessment as defined.

Prior to providing a description of the fishery it is important to be clear about the precise extent of potential 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 clear definition is useful for both clients and assessors to categorically state what was included in the assessment, and what was 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 unit of certification for the fishery under consideration is as set out below.

The fishery assessed for MSC certification is defined as 8 Units of Certification, the following six for the Swedish vessels under assessment:

UoC 1

Species:	*Nephrops norvegicus*
Stock:	ICES division IIIa Danish/Swedish Nephrops
Geographical area:	Skagerrak
Harvest method:	Demersal Trawl using an open topped Swedish grid.
Client Group:	Member vessels of the Fiskeri AB Ginneton that have signed up the Code of Conduct – see the list of vessels (page 15) at www.certifieratfiske.se where this list will be announced and updated.
Other Eligible Fishers:	Swedish and Danish registered vessel covered by the certification sharing agreement

UoC 2

Species:	*Nephrops norvegicus*
Stock:	ICES division IIIa Danish/Swedish Nephrops
Geographical area:	Kattegat
Harvest method:	Demersal Trawl using an open topped Swedish grid.
Client Group:	Member vessels of the Fiskeri AB Ginneton that have signed up the Code of Conduct – see the list of vessels (page 15) at www.certifieratfiske.se where this list will be announced and updated.
Other Eligible Fishers:	Swedish and Danish registered vessel covered by the certification sharing agreement

UoC 3

Species:	*Nephrops norvegicus*
Stock:	ICES division IIIa Danish/Swedish Nephrops
Geographical area:	Skagerrak
Harvest method:	Demersal SELTRA trawl
Client Group:	Member vessels of the Fiskeri AB Ginneton that have signed up the Code of Conduct – see the list of vessels (page 15) at www.certifieratfiske.se where this list will be announced and updated.
Other Eligible Fishers:	Swedish and Danish registered vessel covered by the certification sharing agreement

UoC 4

Species:	*Nephrops norvegicus*
Stock:	ICES division IIIa Danish/Swedish Nephrops
Geographical area:	Kattegat
Harvest method:	Demersal SELTRA trawl
Client Group:	Member vessels of the Fiskeri AB Ginneton that have signed up the Code of Conduct – see the list of vessels (page 15) at www.certifieratfiske.se where this list will be announced and updated.
Other Eligible Fishers:	Swedish and Danish registered vessel covered by the certification sharing agreement

UoC 5

Species:	*Nephrops norvegicus*
Stock:	ICES division IIIa Danish/Swedish Nephrops
Geographical area:	Skagerrak
Harvest method:	Creel
Client Group:	Member vessels of the Fiskeri AB Ginneton that have signed up the Code of Conduct – see the list of vessels (page 15) at www.certifieratfiske.se where this list will be announced and updated.
Other Eligible Fishers:	Swedish and Danish registered vessel covered by the certification sharing agreement

UoC 6

Species:	*Nephrops norvegicus*
Stock:	ICES division IIIa Danish/Swedish Nephrops
Geographical area:	Kattegat
Harvest method:	Creel
Client Group:	Member vessels of the Fiskeri AB Ginneton that have signed up the Code of Conduct – see the list of vessels (page 15) at www.certifieratfiske.se where this list will be announced and updated.
Other Eligible Fishers:	Swedish and Danish registered vessel covered by the certification sharing agreement

Please note that whilst the Unit of Certification details the full extent of what is being assessed, it is the full and complete Public Certification Report that precisely defines the exact nature of certification for this fishery.

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

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

The Norway lobster (*Nephrops norvegicus*) is native to the Skagerrak and Kattegat and therefore requirements in relation to ISBF do not apply to this assessment.

3.2 Overview of the fishery

3.2.1 Fiskeri AB Ginneton/Gothenberg Fish Auction

The client for this assessment is a Swedish-owned fishing company, Ginneton. An up to date list of the vessels included in the UoC can be found at www.certifieratfiske.se and include all Swedish-registered vessels targeting Nephrops.

History of the Fishery

Vessels exploit a stock management unit, which is restricted to ICES sub area IIIa – Kattegat & Skagerrak. In recent years the TAC, which governs total landings by all fisheries has been set at 5,200 tonnes per annum, and recorded landings have not exceeded the agreed TAC in over a decade. Further details are provided in section 3.3.3.

Four nations land *Nephrops* from IIIa. In 2010, the Danish fleet landed 3,721 tonnes (73%), the Swedish fleet landed 1,249 tonnes (24%), the Norwegian fleet landed 124 tonnes (2%) and German fleet landed 29 tonnes (<1%).

Area Under Evaluation

This assessment covers Swedish vessels catching *Nephrops* in the Skagerrak and Kattegat (ICES area IIIa.

3.2.2 Species and Fishing Practice

Species type/s

The target species for the fishery under certification is *Nephrops norvegicus*. As indicated initially, this report does not intend to provide a scientifically comprehensive description of the species. Interested readers should refer to sources that have been useful in compiling the following summary description of the species.

These include:

http://www.fao.org/fishery/species/2647/en

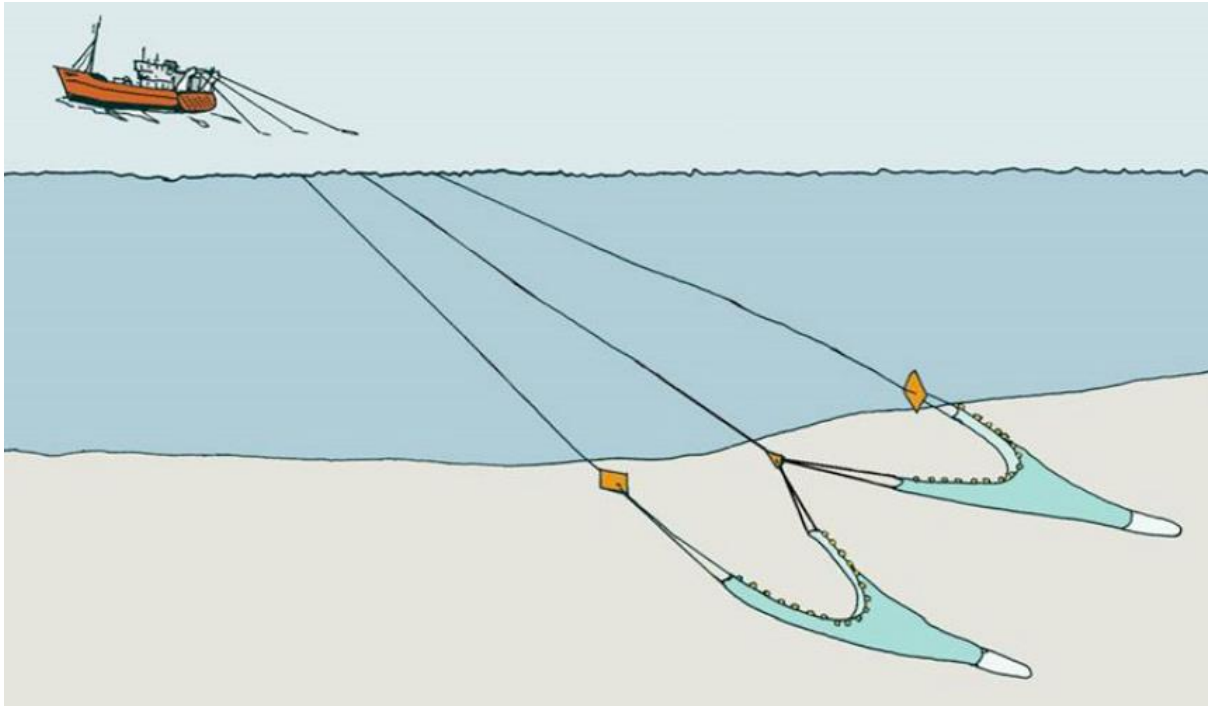
http://www.marinespecies.org/aphia.php?p=taxdetails&id=107254

http://www.marlin.ac.uk/speciesfullreview.php?speciesID=3892

Fishing Practices

The Nephrops fishery is targeted by demersal trawl. The demersal or bottom otter trawl (single, twin and pair) is a towed fishing gear designed and rigged to have bottom contact during fishing, towed by trawl vessels. These are mostly in excess of 12m and therefore requiring a Vessel Monitoring System (VMS) to be fitted. A demersal trawl (Fig 1) is a cone-shaped net consisting of a body, closed by a Cod End knot, and with lateral wings extending forward from the opening. The two towing warps lead from the vessel to the otter boards that act 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, which 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.

Figure 1 Diagram of demersal (otter) trawl)



As of 2013 the trawls must be fitted with a selectivity device; the Seltra trawl and the Swedish grid are the two devices specified in the UoCs under assessment (UoCs 1 and 2 use the Swedish grid, while UoCs 3 and 4 use the Seltra trawl). The Swedish grid is by far the most common device used by the Swedish fleet.

Directed fishing for Nephrops requires:

- Mandatory grid with 35 mm slot width.
- The mesh size of the cone part of the trawl and the extension piece shall be 70 mm square mesh.
- The total length of the cone and extension piece must be at least 8m.

Mixed fishing in bottom trawls and purse seines requires:

- The basic rule is that the mesh size should be at least 120 mm diagonal mesh (diamond mesh). The mesh size applies to cone and extension piece however at least 8 meters.
- *Exceptions* (SELTRA TRAWL): 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 meters long and placed at 4 meters 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.

Gear regulations in Sweden are set to be updated in February 2014, which may include a modified grid design that seeks to further reduce bycatch and catches of small Nephrops.

Figure 2 Example of a Swedish Nephrops trawler, Vera C GG210

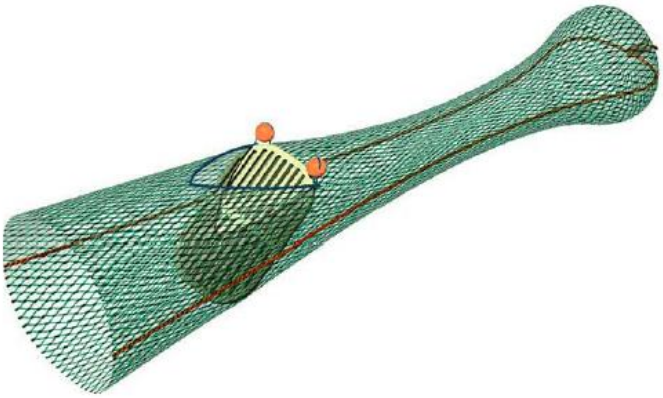
(Source: www.gifeco.se)

Figure 3 Swedish grid within a Nephrops trawl

(Source: R Cappell)

The use of grids to improve trawl selection depends little on the behavioural reactions of species, but instead relies more on physical filtering the catch (e.g. Robertson and Shanks 1997). The grid generally works by allowing those animals small enough to pass through a row of vertical bars to move into the codend, while those that are too large are guided to their escape. Consequently, large fish are expelled from the trawl, whereas the smallest fish can still be retained. When compared with a standard 70 mm diamond-mesh trawl, trials with the grid showed a reduction in the catch of commercially sized fish (whiting, haddock and cod) by 80–100% and under- sized fish by 30–65% (by weight) (Ulmestrand and Valentinsson 2003).

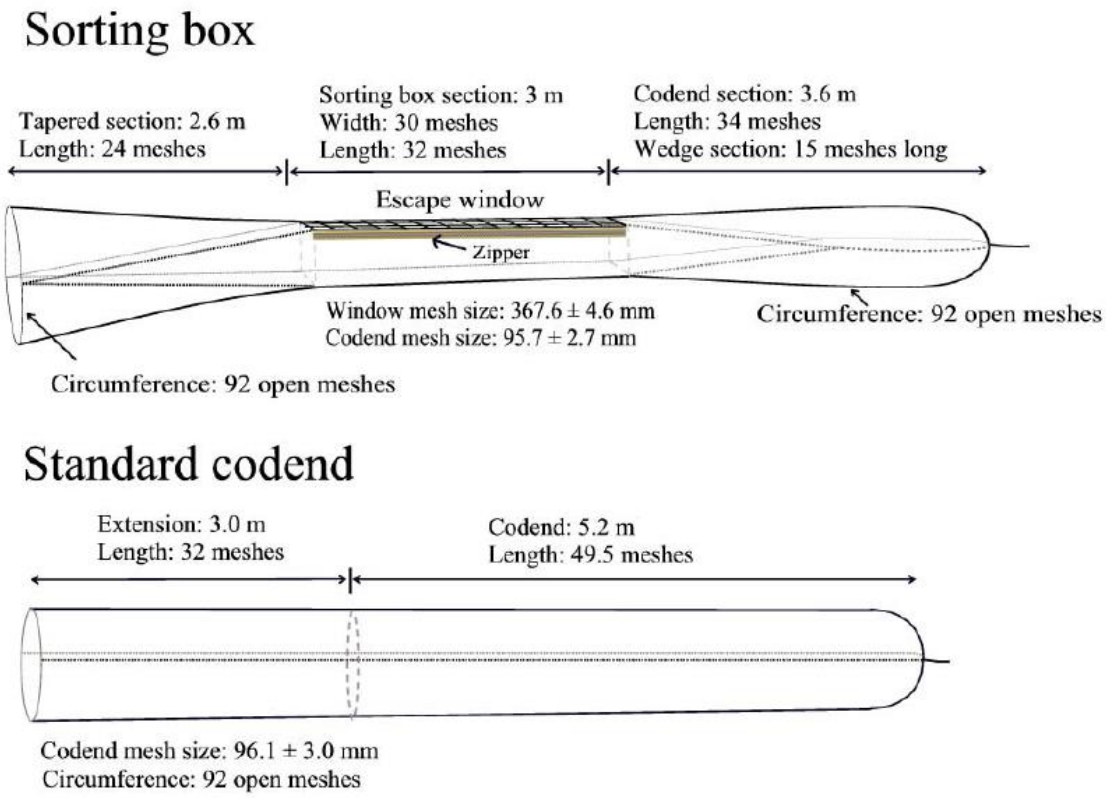
Figure 4: Diagram of grid trawling gear



Source: Catchpole and Revill

The seltra gear includes a square mesh panel that facilitates the escape of roundfish, such as cod, whiting and haddock. The inclusion of a square-mesh panel in the net alters the physical conditions within the trawl in a way that encourages an escape response from several fish species. Observations indicate that fish respond actively to a sudden change in water flow and light conditions, as experienced by fish when they pass from diamond to square-mesh sections of netting (Arkley 1990).

Figure 5: Diagram of Seltra trawl



(Source: DTU Aqua, 2010)

Nephrops is also targeted using creels (pots) (UoCs 5 and 6). Long strings (fleets) of baited pots are laid on the seabed with a marker buoy at surface to enable location when hauling after one or two days in situ on the seabed. This is a 'passive' gear that has comparatively little impact on the seabed.

Figure 6 Nephrops creel in situ

(Source: www.nephrops.eu)

3.3 Principle One: Target Species Background

Principle 1 of the Marine Stewardship Council standard states that:

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

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

In the following section the key factors which are relevant to Principle 1 are outlined. The primary sources of information on this section are:

- ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13.
- ICES. 2012b. Report of the Study Group on *Nephrops* Surveys (SGNEPS), 6–8 March 2012, Acona, Italy. ICES CM 2012/SSGESST: 19. 36 pp.

3.3.1 Nephrops fishery resources and life history

Taxonomy and geographic range

The Norway lobster *Nephrops norvegicus* (Linnaeus, 1758), also known as scampi, langoustine or Dublin Bay prawn, is a decapod crustacean of the family *Nephropidae*. The species is distributed throughout the northeast Atlantic from Iceland and the north western coast of Norway in the north to the Atlantic coast of Morocco, and is also found in the western and central Mediterranean, but is absent from the Baltic Sea (Holthuis, 1980). There are important commercial fisheries for Nephrops across its geographical range.

Biology and life histories:

Nephrops are found primarily in muddy sediments in which they build complex burrow systems. They are found in depths from 20 m to 800m and so can be found in isolated sea lochs on the west coast of Scotland but also on the edge of the continental slope. Commercially exploited populations of Nephrops often occur in discrete geographical areas characterised by muddy sediments, and these separated populations may therefore exhibit significant variations in population dynamics. Tagging studies do not show any significant migration of adult Nephrops (Chapman and Rice 1971), although movements between populations could take place through passive dispersal of larvae by oceanic currents during the planktonic larva phase which lasts between 4 and 8 weeks, and this potential interchange of larvae between populations was one explanation for the lack of genetic differences observed in populations off Iceland (Pampoulie et al., 2011.). However the study also showed no genetic differences between the Icelandic samples and those from Scotland. Other genetics studies using a range of techniques showed significant genetic differentiation between populations of Nephrops but without a clear geographical pattern (Maltagliati et al., 1998; Stamatis et al., 2004, 2006). There is a current research project investigating potential genetic differentiation in the Skagerrak and Kattegat but the results have not yet been published.

Whilst incubating their eggs, the females rarely come out of the burrows, and so are not vulnerable to trawling (Chapman, 1979).

The incubating females remain in their burrows throughout the winter and emerge in spring and summer to moult and mate. However, the incubating females will emerge from their burrows in response to bait and so can be captured in creel fisheries.

In relation to the fisheries for Nephrops, the key behavioural characteristic is the pattern of emergence from the burrows (Bell, Redant and Tuck, 2006). Emergence behaviour is influenced by light intensity,

season, sex and reproductive status of individual Nephrops, and tide strength (Chapman and Howard, 1979). In addition juvenile Nephrops tend to remain in the burrows most of the time. One of the key components of standard fisheries stock assessment models, the size and sex composition of the target species caught in trawls, is strongly dependent for Nephrops on the time of day, the season and the state of the tide, and can vary from stock to stock. For example, some fisheries occur throughout the year and consist of both males and females, whereas other fisheries are based primarily on male dominated winter fishing. The fishery in the Skagerrak and Kattegat occurs all year round.

Nephrops are omnivorous feeding primarily on crustaceans, molluscs and to a lesser extent polychaetes and echinoderms (Parslow-Williams *et al*., 2002). They emerge from their burrows to eat, but may also act as a suspension feeder (Lars-Ove et al., 1993). Growth (and fecundity) are known to vary geographically and have been shown to be negatively correlated with burrow density (Tuck *et al.*, 1997). Thus, growth rate appears to be density-dependent, and is also thought to be related to food availability. Nephrops may act as a prey species for various groundfish species such as cod, but it cannot be considered to be a key low trophic level (LTL) species against the MSC criteria.

Nephrops stock dynamics may be influenced by the distribution of suitable habitat, fishing, predation and oxygen depletion. The patchiness and varied density of Nephrops populations have been mainly correlated with the heterogeneous nature of the sediment and the production of pelagic larvae, whose dispersal is dependent on sea currents (Hill, 1990). There have been suggestions that Nephrops abundance is inversely correlated with abundance of cod, but there is no clear evidence that Nephrops stock dynamics in the Skagerrak and Kattegat are driven by changes in cod abundance. Stock dynamics can also be influenced by severe oxygen depletion, which forces Nephrops out of their burrows and increases both fishing and natural mortality. Severe oxygen deficiency appeared to have a strong impact on Nephrops in the Kattegat in 1988 (Bagge et al., 1990).

3.3.2 Status of stocks

Introduction

Stock assessment of the Nephrops fisheries in the Skagerrak and Kattegat (Sub-Area or Division IIIa) is undertaken under the auspices of the International Council for the Exploration of the Sea (ICES) Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). The Working Group also undertakes assessment of Nephrops fisheries in the various functional units within the North Sea (ICES Sub-Area IV). Data collection and assessment of Nephrops stocks are based around Functional Units (FUs) which are geographical areas defined by groupings of ICES statistical rectangles and which correspond to discrete areas of muddy sediment in which the highest densities of Nephrops are found. There are currently 34 FUs for Nephrops, although new FUs may be added to this list as minor landings from areas outside the FUs increase to become important commercially exploitable populations. However Nephrops management including the setting of TACs is undertaken at a wider geographical scale, for the North Sea (ICES Sub-Area IV) as a whole comprising 9 FUs, and for ICES Sub-Area IIIa comprising FUs 3 and 4. In addition the (now superseded) ICES Nephrops Working Group previously grouped FUs into smaller “Management Areas” to provide information for more localised management, but this practice was discontinued in 2008 because it served no practical purpose.

WGNSSK members come from a wide range of countries and have expertise on species other than Nephrops and thus the stock assessment of Nephrops in Sub-Area IIIa is essentially fully peer–reviewed during the course of the WGNSSK annual meeting. Additional peer review of the WG report then occurs through a group of independent experts (ICES Review Group). The assessment methodology will also be “benchmarked” through a Benchmark Workshop every three to five years.

The aim of benchmarking is to reach a consensus agreement on an assessment methodology that is to be used in future assessments and to be laid down in a stock annex. The process is reviewed by independent experts and is open to stakeholders and includes all aspects of the assessment process: ecosystem and fisheries data, stock distribution, the assessment model, forecast method and reference points. Although it is a single species assessment, the benchmarking aims to integrate ecosystem information into the assessment. ICES Expert Groups will themselves develop new assessment approaches, but benchmark workshops are intended to formalize the process by which changes in methodology are agreed in order to assure quality, consistency and documentation. The previous

benchmark meeting for Nephrops assessments occurred in 2009 (ICES, 2009), and another is scheduled for North Sea stocks in 2013.

The annual stock assessments then form the basis of ICES fisheries advice formulated through the ICES Advice Drafting Group and approved by the Advisory Committee on Management (ACOM). ICES stock assessments and the management advice that emanate from those assessments are made freely available through publication on the ICES website of the Working Group reports and the ICES Advice Books.

In many previous MSC assessments for Nephrops, the fisheries had problems with achieving certification because the geographical scale at which TACs were allocated was very much larger than the scale at which the stock assessments were undertaken. This mismatch could lead to uneven exploitation patterns across the various FUs resulting potentially in over-exploitation within an individual FU even though annual TACS had not been exceeded. ICES now undertakes the stock assessment for *Nephrops* in Division IIIa as a single stock (ICES, 2012a). In previous assessments the populations in the two functional units, Skagerrak (FU3) and Kattegat (FU4), were assessed separately because of differences in size compositions observed in the 1980s and 1990s. It is now thought that these differences were generated primarily by differences in fishing operations rather than stock characteristics, and because the distribution is continuous across the Skagerrak and Kattegat and recruits are exchanged between the two FUs, there is no longer sufficient reason to assess the FUs separately. As a TAC is allocated for Division IIIa, the management unit coincides with the spatial scale at which the stock is assessed.

Data available and stock assessment methodology

For the Nephrops fishery in the Skagerrak and Kattegat (Division IIIa) long term data are available on overall landings, fishing effort from log books and size distributions of both landings and discards allowing the evaluation of long term trends in key stock indicators. Biological data including growth parameters (Ulmestrand and Eggert, 2001), size at maturity, discard mortality (Wileman et al., 1999) and assumptions about natural mortality rates for males and females are used as input parameters for analytical assessments, although there is considerable uncertainty in particular surrounding estimates of growth rates and discard survival (ICES, 2012b).

The key uncertainty underlying traditional stock assessments based on fisheries data is that adult Nephrops exhibit diurnal, seasonal and sex-related variations in emergence behaviour (Chapman and Howard, 1979) and so conventional fisheries data may provide a poor indicator of stock status. Pioneered in Scotland in the early 1990s, a fishery-independent method of estimating Nephrops stock abundance has been developed using underwater TV surveys of Nephrops burrow complexes. As the method counts burrows and not adult Nephrops, this approach is not reliant on Nephrops emerging from their burrows and so can be undertaken at any time. The method involves towing a TV camera mounted on a dredge over Nephrops grounds as defined by patches of muddy sediment and counting the number of Nephrops burrow complexes within a known area. All Nephrops burrow openings identified in view of the camera are allocated to a burrow complex, and the numbers of burrow complexes that cross a defined line on the TV screen are counted. Assuming a 1:1 rate of occupancy, the average population density can be estimated which is then raised to the known area of suitable sediment to give a measure of population size. However, population density will be overestimated if the counts include all burrow complexes that extend beyond the edges of the field of view (the edge effect). Regular surveys have been conducted for many of the main *Nephrops* fisheries around Britain and Ireland (ICES, 2010b) providing long-term abundance indices, and have recently been instigated in the Skagerrak and Kattegat.

The TV burrow count surveys provide a fishery-independent estimate of stock biomass, but there are a number of inherent uncertainties in the methodology. These uncertainties include recognition of burrows created by Nephrops rather than other burrowing animals, burrow occupancy, burrow and animal size, variation between counters, “edge effects”, survey design (randomised fixed grid or random stratified sampling) and the level of sampling effort required to obtain a precise measure of burrow density. These uncertainties in the methodology have been investigated in depth through a series of ICES workshops and Study Groups (e.g. Addison and Bell, 2000; ICES, 2007: 2008; 2009a, b; 2010b; 2012b) and peer reviewed publications (e.g. Campbell et al., 2009; Morello et al., 2007). Whilst there are undoubtedly a number of uncertainties in this methodology, all forms of stock surveys have inherent uncertainties and in contrast to many methods of estimating abundance, it is possible to systematically

investigate biases in Nephrops TV surveys (Campbell et al., 2009). Standard TV survey methodology is now agreed under the auspices of the ICES Study Group on Nephrops Surveys (SGNEPS).

The TV survey provides an estimate of stock biomass. Data on total catches defined as landings including dead and surviving discards, along with an assumption of a discard survival rate of 25% permits a calculation of total removals from the fishery. The ratio of total removals to stock biomass provides an estimate of observed harvest ratio.

Reference points / biological limits

In previous years Nephrops stock assessments have been based on an evaluation of trends in stock indicators, both fishery-dependent and the fishery-independent estimate of stock biomass from TV surveys, but there have been no explicitly defined reference points against which to assess the status of stocks. As there are no age-based analytical assessments for Nephrops, it is difficult to estimate MSY and associated appropriate reference points. Techniques for estimating proxies for Fmsy for Nephrops were considered in detail at the ICES WGNSSK meeting in 2010 (ICES, 2010a). Three candidates for Fmsy were considered: $F_{0.1}$, $F_{35\%SPR}$ and Fmax. $F_{0.1}$ represents the fishing mortality rate at which the marginal yield-per-recruit is only 10% of the marginal yield-per-recruit on the unexploited stock, $F_{35\%SPR}$ represents the fishing mortality rate that corresponds to 35% of the unfished spawning stock biomass per recruit and Fmax is the fishing mortality rate that maximises yield-per-recruit. The Working Group selected preliminary stock-specific Fmsy proxies according to the perception of stock resilience, factors affecting recruitment, population density, knowledge of biological parameters, and the nature of the fishery including the relative exploitation of the sexes and the historical harvest rate vs. stock status (Table 1).

Table 1 Decision-making framework for selection of stock-specific Fmsy proxies

		Burrow density (average burrows m^{-2})		
		Low	Medium	High
		< 0.3	0.3–0.8	>0.8
Observed harvest rate or landings compared to stock status (historical performance)	$>F_{max}$	$F_{35\%SPR}$	F_{max}	F_{max}
	F_{max}–$F_{0.1}$	$F_{0.1}$	$F_{35\%SPR}$	F_{max}
	$< F_{0.1}$	$F_{0.1}$	$F_{0.1}$	$F_{35\%SPR}$
	Unknown	$F_{0.1}$	$F_{35\%SPR}$	$F_{35\%SPR}$
Stock size estimates	Variable	$F_{0.1}$	$F_{0.1}$	$F_{35\%SPR}$
	Stable	$F_{0.1}$	$F_{35\%SPR}$	F_{max}
Knowledge of biological parameters	Poor	$F_{0.1}$	$F_{0.1}$	$F_{35\%SPR}$
	Good	$F_{35\%SPR}$	$F_{35\%SPR}$	F_{max}
Fishery history	Stable spatially and temporally	$F_{35\%SPR}$	$F_{35\%SPR}$	F_{max}
	Sporadic	$F_{0.1}$	$F_{0.1}$	$F_{35\%SPR}$
	Developing	$F_{0.1}$	$F_{35\%SPR}$	$F_{35\%SPR}$

(Source: ICES, 2010a)

Having developed a decision-making framework for selecting stock-specific Fmsy proxies, the next stage is to calculate values for those proxies for the stock using data from the fishery on size at length in a cohort analysis approach using either an age structured model or a length structured model. As the exploitation rates in many stocks vary significantly between the sexes because of differences in emergence patterns, the Fmsy proxies were determined for males, females and combined sexes. The use of a yield-per-recruit cohort model then allows the calculation of harvest ratios which are equivalent to the various potential proxies for Fmsy. The cohort model predicts the population size of animals >17mm CL at the Fmsy proxy, which is compared with projected landings to provide a “target” harvest rate. The projected landings are the projected catch at size using the Fmsy proxy value of F and applying the appropriate selectivity dependent on mesh size used in the fishery.

The model assumes that 25% of discards survive and are not therefore counted as “removals”, i.e. the same assumption is used in the calculation of harvest ratio as that calculated from observed landings and biomass estimates from the TV survey.

The calculated harvest ratio reference point can then be used in conjunction with the biomass estimate from the TV surveys in two ways. Firstly, comparison of the observed harvest ratio with the harvest ratio reference point allows an evaluation of stock status against a defined reference point. Secondly, the harvest ratio reference point can be used with the stock biomass estimate to set a TAC for the fishery next year.

The current assessment approach is an improvement on previous standard assessment methodologies for three reasons. Firstly, the use of a harvest ratio as a reference point is more widely understood instead of an exploitation rate or F-value, and the observed value of the harvest ratio can be estimated simply from the landings data and biomass estimate from the TV survey and then directly compared with the reference value calculated from the yield-per-recruit model. Secondly, the reference harvest ratio is calculated based on the population of Nephrops of 17 mm CL and above, which allows a direct comparison with the TV survey, which also provides a biomass estimate of Nephrops of the same size range. This overcomes a previous criticism of the assessment approach (ICES, 2007) that the TV survey was measuring abundance of smaller Nephrops that were not seen in trawl catches and therefore the fishery dependent and fishery-independent estimates of biomass were not calculating the same metric. Thirdly this approach has the benefit that it can be applied to a biomass estimate from a single year's TV survey, without requiring a time series of biomass estimates. Previously, Nephrops assessments had focussed on long-term trends in a series of stock indicators.

ICES WGNSSK notes that the methodology of calculating a harvest ratio reference point equivalent to a proxy Fmsy is still under development and the methodology will be reviewed at the ICES WKNEPH 2013 Benchmark Workshop on Nephrops Stocks, attended by both ICES Expert Group members and invited outside experts.

No biomass based reference point such as MSY Btrigger has been estimated for this stock because there is no time trend of biomass estimates from the TV survey.

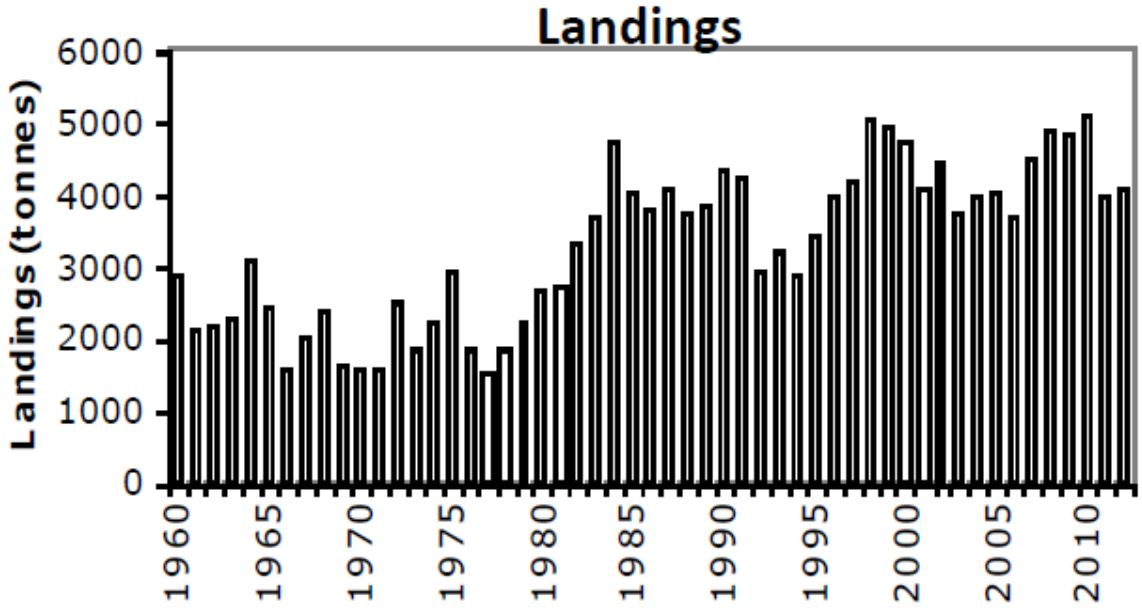
Stock status – results of stock assessment for Nephrops in Division IIIa

Fisheries data

The total landings of Nephrops for Division IIIa have remained relatively stable for the last thirty years. Landings were the highest on record in 2010, but have since returned to long-term average levels (Figure 7). In recent years around 60% of the landings come from FU3. The Skagerrak (FU3) is exploited primarily by Denmark (72%) and Sweden (25%) with a small number of landings in Norway. Around 10% of total landings in the Skagerrak come from the creel fishery (accounting for 30% of Swedish landings). Denmark and Sweden are responsible for 77% and 22% respectively of the landings of Nephrops in the Kattegat, with Germany comprising the remaining 1%.

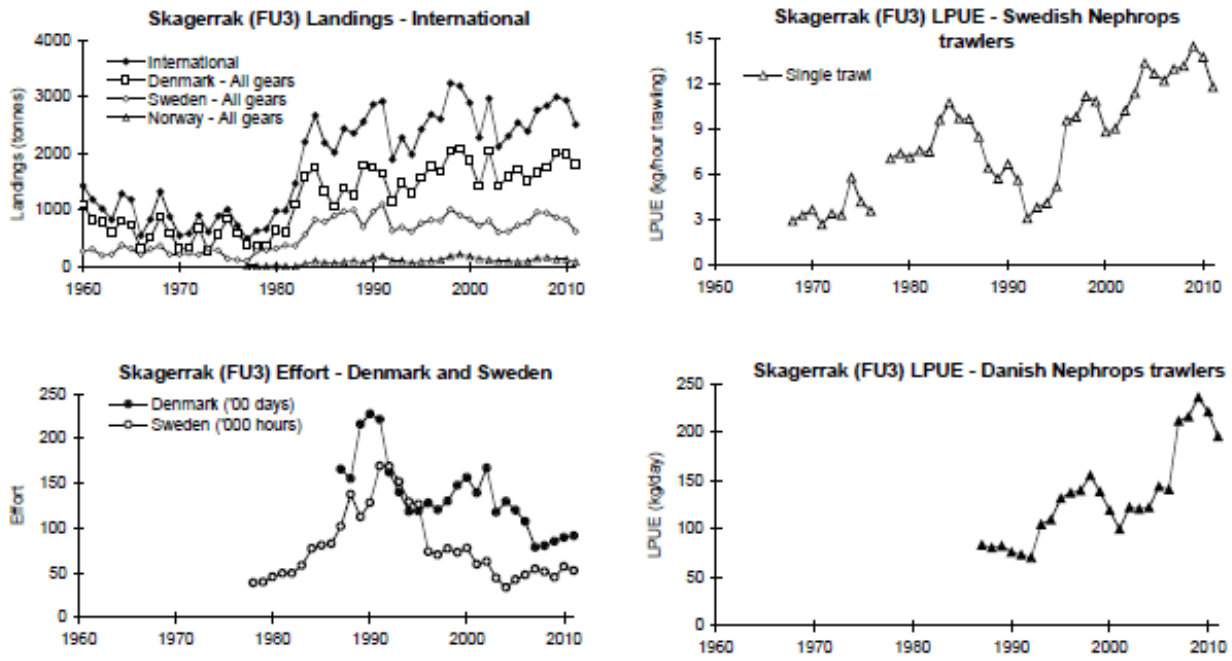
Trends in fishing effort and landings per unit effort (LPUE) based on logbook returns show similar trends in both the Swedish and Danish fleets and in both Skagerrak and the Kattegat. Fishing effort has declined in recent years partially due to effort restrictions within the cod recovery programme, and LPUE in the Nephrops fishery has increased significantly in recent years (Figure 8 and 9).

Figure 7 total landings of Nephrops in Division IIIa (Skagerrak and Kattegat)



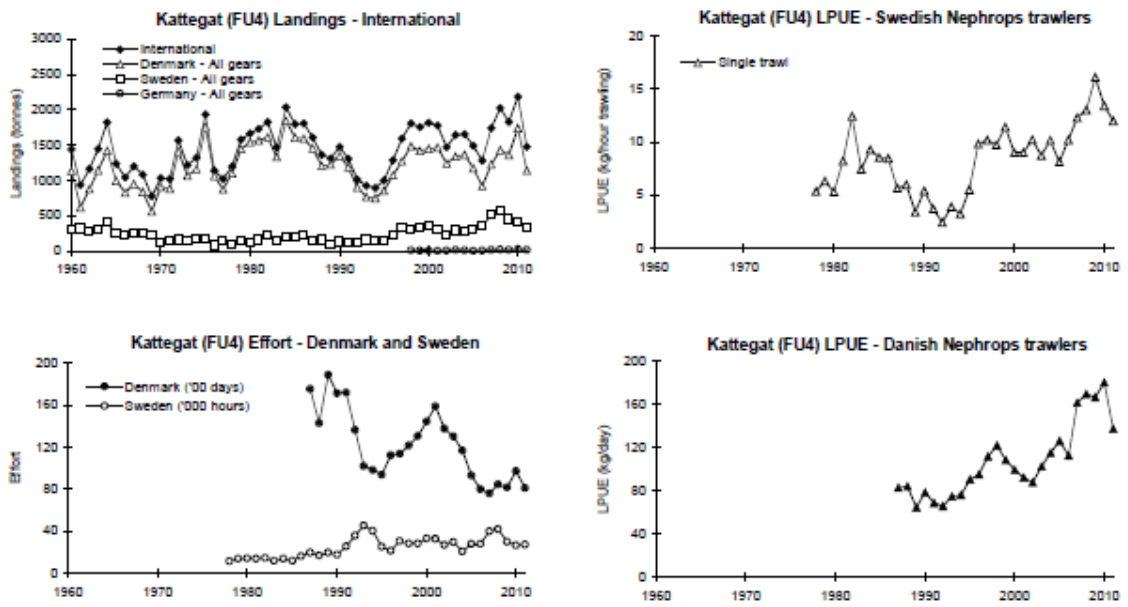
(Source: ICES, 2013)

Figure 8 Landings, fishing effort and LPUE for Swedish and Danish trawlers in the Skagerrak and Kattegat (FU3)



(Source: ICES, 2010a)

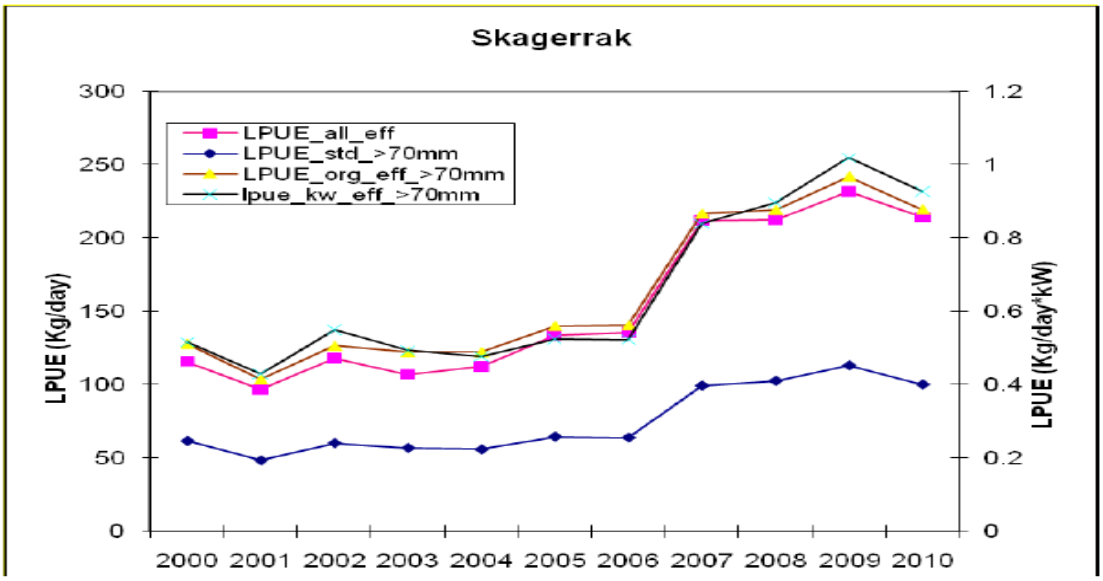
Figure 9 Landings fishing effort and LPUE for Swedish and Danish trawlers in the Kattegat (FU4)



(Source: ICES 2010a)

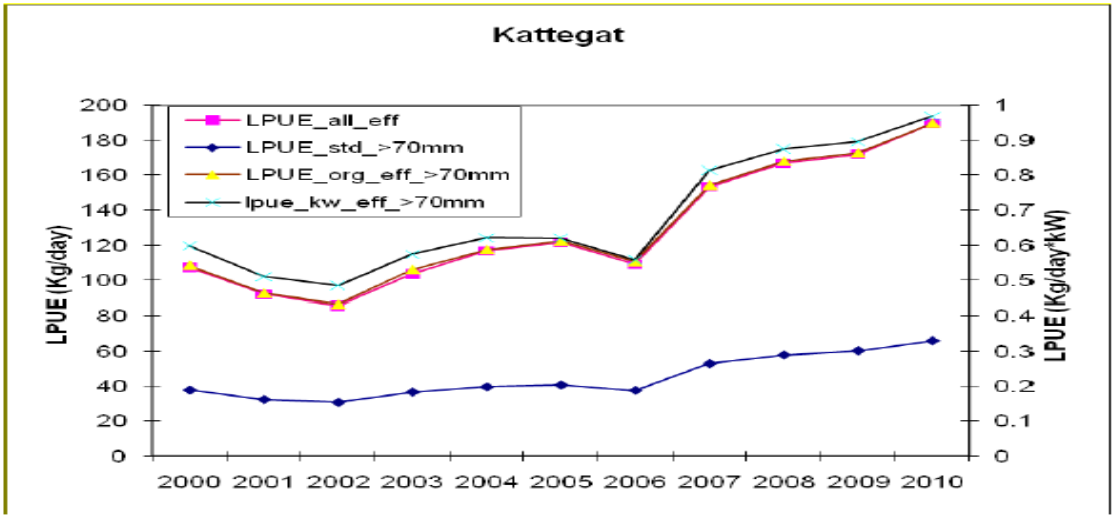
Danish log book data has been standardised for various factors including vessel size using a GLM, but the overall trend in standardised LPUE for both the Skagerrak (Figure 10) and the Kattegat (Figure 11) is very similar to the unstandardised data. Size distributions of both the landings and discards are available for both the Danish and Swedish fleets in both the Skagerrak and the Kattegat. In earlier years, samples were collected from selected fishermen, but all data are now collected by on-board observers. Mean size of all size categories has fluctuated without trend in both the Skagerrak and Kattegat (Figures 12 and 13).

Figure 10 Standardised LPUE data for the Danish fleet in the Skagerrak (FU3)



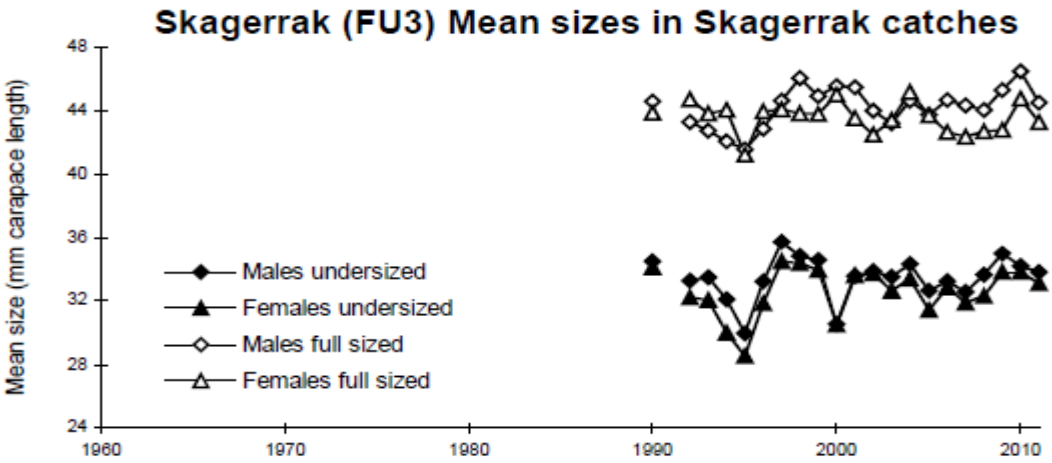
(Source: ICES, 2010a)

Figure 11 Standardised LPUE data for the Danish fleet in the Kattegat (FU4)



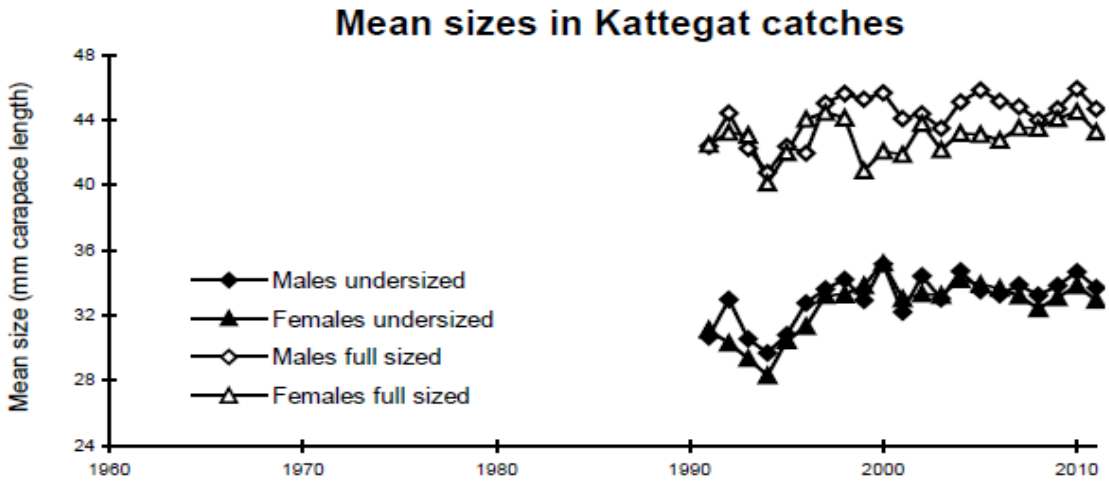
(Source ICES, 2010a)

Figure 12 Mean size of landings and discards of Nephrops in the Skagerrak



(Source: ICES, 2010a)

Figure 13 Mean size of landings and discards of Nephrops in the Kattegat



(Source: ICES, 2010a)

TV survey estimates of biomass

The first TV survey to cover all of the major fishing grounds in both the Skagerrak and Kattegat took place in 2011 (Figure 14). The survey design is a fixed grid with random station selection. Burrow count estimates of population density are raised to provide an estimate of population abundance using the VMS data from the Swedish and Danish fishery (Figure 15).

The survey coefficient of variation (CV) for the Skagerrak and Kattegat TV survey was estimated at 5.9% well below the level of <20% recommended by SGNEPS (ICES, 2012b).

For Nephrops in the Skagerrak and Kattegat, the largest source of perceived bias is the edge effect, primarily due to the relative large sizes of burrow complexes. The cumulative bias correction factor was estimated to be 1.1 for the Division IIIa survey, equivalent to the TV survey overestimating abundance by 10%.

Estimates of stock biomass from the TV surveys combined with estimated total removals from the fishery (assuming discard survival rate of 25%) in 2011 and 2012 provided observed harvest ratios of 5.0% and 8.2% respectively. Estimates of absolute abundance from the TV survey suggested a 30% decrease in abundance from 2011 to 2012.

Harvest ratio estimates and stock status vs. reference points

For the Nephrops stock in Division IIIa the harvest ratios which are equivalent to the various Fmsy proxies were calculated from average length frequency data from the fishery from 2008 to 2010 (Table 2). The estimated burrow density for this stock is defined as medium (0.3-0.8 burrows m^{-2}), and as the observed harvest ratio in 2011 was between $F_{0.1}$ and Fmax, then $F_{35\%SPR}$ can be selected as a proxy for Fmsy. However because of the very high discard proportions observed in this fishery, $F_{35\%SPR}$ is unusually higher than Fmax, and so Fmax is chosen as a conservative proxy for Fmsy. The estimated value of the harvest ratio at Fmax for the combined sexes in this fishery is 7.9% (Table 2), which can be used as a target reference point in this fishery.

Table 2 Harvest ratios for Fmsy proxies based on average length frequency data from 2008 to 2010.

	Male	Female	Combined
F_{max}	6.8 %	10.0 %	7.9 %
$F_{0.1}$	4.9 %	7.6 %	5.6 %
$F_{35\%SPR}$	8.1 %	12.9 %	10.5 %

(Source: ICES, 2010a)

The observed harvest ratios from the TV surveys in 2011 and 2012 were 5.0% and 8.2% respectively. The observed harvest ratio was therefore well below the target reference point in 2011, but due to the observed decline in abundance in 2012, the observed harvest ratio was slightly above the target reference point in 2012. This observed harvest ratio is still considerably lower than the less conservative reference point of 10.9% based on using $F_{35\%SPR}$ as a proxy for Fmsy. It should be emphasised that the calculated reference points based on the various Fmsy proxies are preliminary estimates based on a novel approach and may well be refined in due course after further analysis.

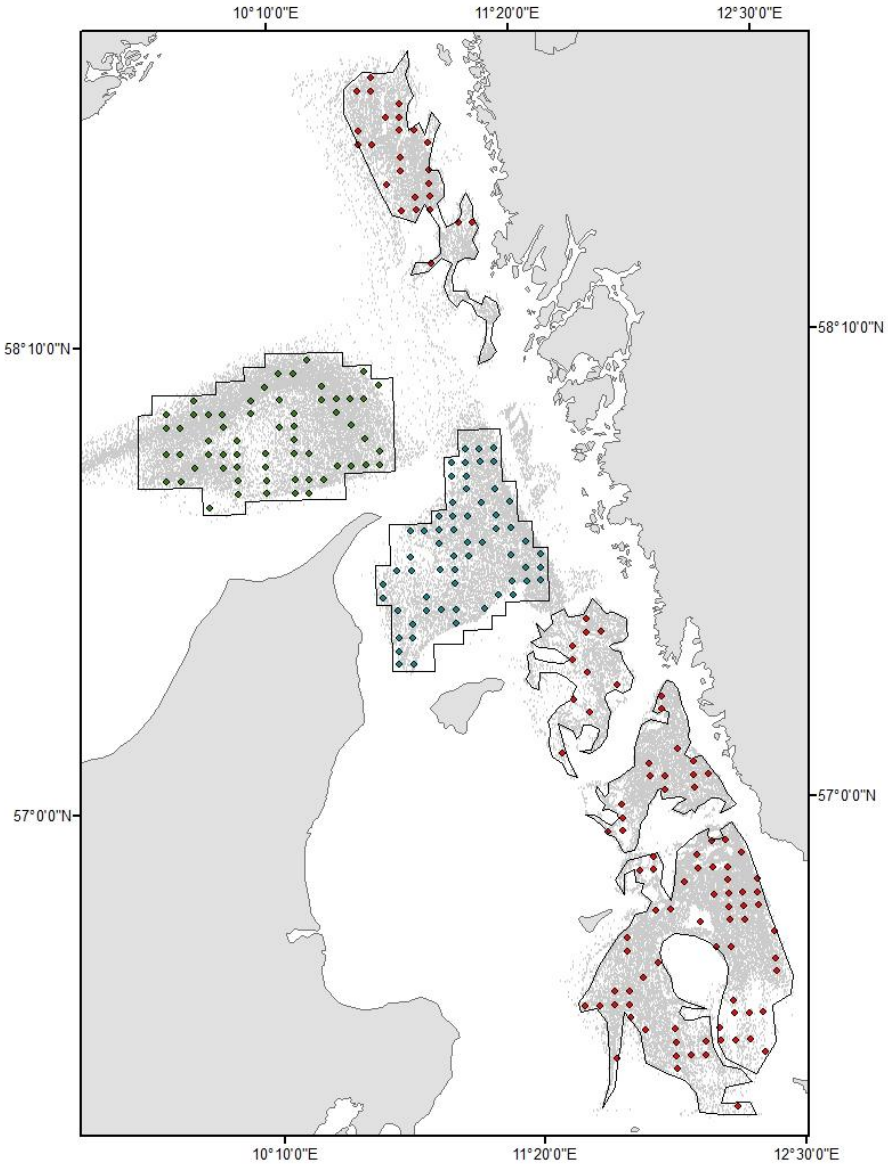
There is no biomass related reference point, such as MSY Btrigger, defined for this stock. In other Nephrops stocks for which there is a long time series of biomass estimates from TV surveys, it is possible to define a proxy for MSYBtrigger using either the lowest point in the time series of biomass estimates or the point at which the stock showed signs of stress. As only two years of the full TV surveys are available currently, it is not possible to provide a proxy for MSYBtrigger.

Summary of stock status

Landings have remained relatively stable over the last 30 years, fishing effort has declined over the last 10 years and LPUE shows an increasing trend in recent years. Mean sizes of both landings and discards are fluctuating without trend, from all of which can be concluded that there are no signs of over-exploitation in the Nephrops fishery. There are high numbers of discards observed but this is primarily due to a mismatch of the minimum landing size and the mesh size. Whilst more gear selectivity work is required to provide ways of reducing the high discard rate, the continuing levels of high discards suggest that recruitment levels are stable.

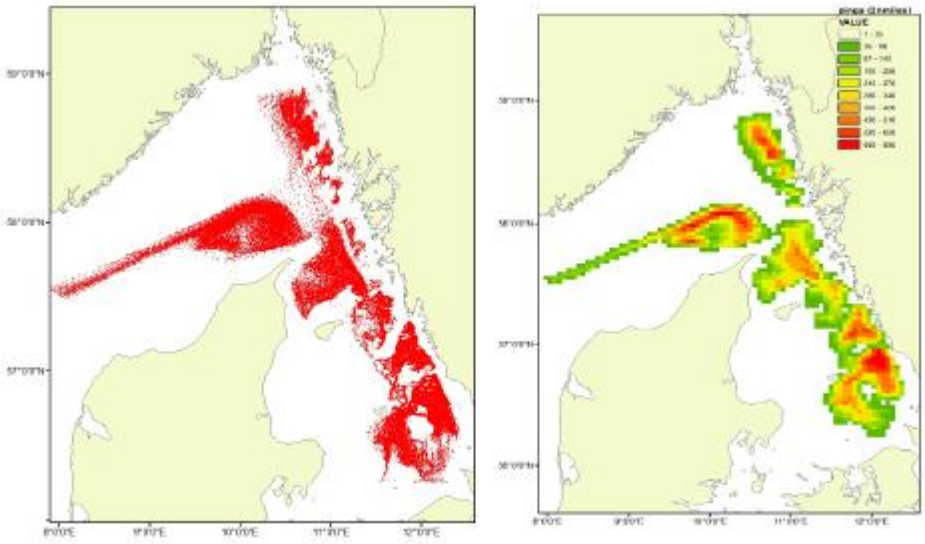
The estimated harvest ratios of 5.0% in 2011 and 8.2 % in 2012 suggest that the stock is being exploited sustainably. The observed harvest ratio for 2012 is slightly above the harvest ratio reference point but WGNSSK used a conservative proxy for Fmsy, and the estimated harvest ratios for the various Fmsy proxies are preliminary estimates, which may be refined.

Figure 14 Distribution of underwater TV survey stations in the Skagerrak and Kattegat in 2011



(Source: TBC)

Figure 15 VMS data for the Danish and Swedish Nephrops fleets - VMS pings and density of VMS pings



(Source: ICES, 2010a)

Management advice based on current stock assessment

Management advice for this stock based on the ICES MSY approach would imply a harvest ratio of 7.9%, which would result in landings of no more than 5019 tonnes in 2014 (Table 3). Assuming that the discard rates do not change from the average of the last three years and that discard survival is 25%, this implies a total catch of no more than 8895 tonnes. (A harvest rate equivalent to that observed in 2012 would result in a slightly higher TAC.) The management advice also includes catch limits based on the scenario of a future ban on discards, which applying a harvest ratio of 7.9% to all catches including discards that have survived up to now, results in catches of no more than 7578 tonnes. It should be noted however that there is some uncertainty surrounding the methodology underlying these calculations.

Table 3. Total catches and landings for 2014 based on various harvest ratio scenarios including the MSY approach and the observed harvest ratio in 2012. * Weights given in tonnes. ** Discard rate is assumed to be 65.4% of catches and discard survival is assumed to be 25%.

Basis	Total catches*	Landings	Dead discards**	Surviving discards**	Harvest rate
	L+DD+SD	L	DD	SD	for L+DD
	5629	3176	1918	535	5
	6756	3812	2302	642	6
MSY approach	8895	5019	3031	845	7.9
F_{2013}	9232	5209	3146	877	8.2
	10133	5717	3453	963	9
	11821	6670	4028	1123	10.5

(Source: ICES Advice Book 2013 6.4.14)

3.3.3 History of fishing and management

In recent years the Nephrops fishery has been strongly influenced by management of cod stocks, which has significantly restricted effort in the Nephrops fishery. Landings of Nephrops in Division IIIa have remained relatively stable since 1987, and only rarely have landings exceeded the agreed TAC (Table 4). ICES advice on management of the Nephrops fishery has previously been variations on maintaining the *status quo*, either through a *status quo* TAC, or maintaining fishing effort at current levels, or maintaining landings at recent average levels (Table 4). It has only been through the advent of the MSY approach that TACs have been set using direct estimates of stock biomass from TV surveys in conjunction with target reference points.

Table 4 Landings of Nephrops in Division IIIa in comparison with the agreed TAC and ICES advice from 1987 to present.

Year	ICES advice	Predicted landings / catch corresp. to advice	Agreed TAC	ICES landings
1987				4.0
1988				3.7
1989				3.9
1990				4.3
1991				4.2
1992		~4.0	3.5	2.9
1993		~4.3	3.5	3.2
1994		2.9	3.5	2.9
1995		2.9	4.8	3.4
1996	*Status quo* TAC	2.9	4.8	4.0
1997	*Status quo* TAC	2.9	4.8	4.2
1998		4.0	4.8	5.1
1999		4.0	4.8	4.9
2000		3.8	5.0	4.7
2001		3.8	4.5	4.1
2002	Catches to be maintained at the 2000 level	4.7	4.5	4.4
2003	Catches to be maintained at the 2000 level	4.7	4.5	3.8
2004	Catches to be maintained at the 2000 level	4.7	4.7	4.0
2005	Catches to be maintained at the 2000 level	4.7	5.2	4.0
2006	No increase in effort	-	5.2	3.7
2007	No increase in effort	-	5.2	4.5
2008	No increase in effort	-	5.2	4.9
2009	Current effort appears to be sustainable	< 5.2	5.2	4.8
2010	Current effort appears to be sustainable	< 5.2	5.2	5.1
2011	Recent average landings (2007–2009) [1)]	< 4.7	5.2	4.0
2012	MSY approach	< 6.0	6.0	4.4
2013	MSY approach[1)]	< 5.2	5.2	
2014	MSY approach without discard ban (landings)	< 5.019		
	MSY approach with discard ban (catches)	< 7.578		

Weights in thousand tonnes.
[1)] In 2011, biennial advice was given for both 2012 and 2013. In 2012, new advice was drafted for 2013 because new information was available.

(Source ICES Advice Book 2013 6.4.14)

3.4 Principle Two: Ecosystem Background

Principle 2 of the Marine Stewardship Council standard states that:

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

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.

Note: Assessment of the Swedish Nephrops fisheries was conducted in conjunction with assessment of the 'Danish demersal trawl' fishery for Nephrops in the Skagerrak and Kattegat. Below we therefore make reference to all trawl UoCs (Swedish UoCs 1 to 4, Danish UoCs 7 & 8) and the Swedish UoCs relating to creel (UoC 5 and 6).

Catch composition

The following tables show total catch composition and proportions for the different gears and areas under this assessment. All data (hereafter called STECF 2012 data) are downloaded from http://stecf.jrc.ec.europa.eu/data-reports, 2013 App 02-2 landings discard rates.xls

The different data for the different gears were selected by using:

- Swedish data in Region II, area 3b1 (for Skagerrak) or area 3a (for Kattegat), gear type TR2 and specon cpart11 for the Swedish grid.
- Danish data in Region II, area 3b1 (for Skagerrak) or area 3a (for Kattegat), gear type TR2, and specon cpart 13c for the seltra gear (in the Kattegat). In the Skagerrak data from the previous gear were used, named as specon "none".

Table 5 2012 catch composition of the Skagerrak Swedish grid fishery

Data from STECF website. Landings (tonnes), discards (tonnes), discard ratio per species and proportions of each species in the total catch are shown.

STECF 2012 data. Swedish grid. Skagerrak Sea.							
FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	443,845	99,16	574,824	56,43	1018,669	90,47
DAB	Dab	0,088	0,02	34,945	99,75	35,033	3,11
PLE	Plaice	0,801	0,18	19,514	96,06	20,315	1,80
COD	**Cod**	0,054	0,01	10,733	99,50	10,787	0,96
FLX	Flounder	0,115	0,03	10,381	98,90	10,496	0,93
WIT	Witch	0,071	0,02	9,586	99,26	9,657	0,86
WHG	Whiting	0,931	0,21	6,864	88,06	7,795	0,69
HKE	Hake	0,086	0,02	4,105	97,95	4,191	0,37
SRX	Rays, stingrays and mantas	0,005	0,00	2,338	99,79	2,343	0,21
HAD	Haddock	0,042	0,01	2,04	97,98	2,082	0,18
LEM	Lemon sole	0,077	0,02	1,805	95,91	1,882	0,17
SOL	Sole	0,491	0,11	0,262	34,79	0,753	0,07
PRA	Prawn	0,427	0,10			0,427	0,04
TUR	Turbot	0,244	0,05	0,159	39,45	0,403	0,04

STECF 2012 data. Swedish grid. Skagerrak Sea.							
FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
POK	Saithe	0,007	0,00	0,357	98,08	0,364	0,03
ANF	Anglerfish	0,019	0,00	0,21	91,70	0,229	0,02
MAC	Mackerel	0,069	0,02	0,077	52,74	0,146	0,01
CRE	Edible crab	0,114	0,03			0,114	0,01
LIN	Ling	0,003	0,00	0,104	97,20	0,107	0,01
LUM	Lumpfish	0,07	0,02			0,07	0,01
POL	Pollack	0,031	0,0069			0,031	0,003
HAL	Atlantic halibut	0,02	0,0045			0,02	0,002
CAT	Catfish	0,012	0,0027			0,012	0,001
SCE	Great Atlantic scallop	0,001	0,0002			0,001	0,00009
TOTAL		**447,623**	100	**678,304**	**N/A**	**1125,927**	**100**

(Source: STECF website)

Table 6 2012 catch composition of Kattegat Swedish grid fishery

Data from STECF website. Landings (tonnes), discards (tonnes), discard ratio per species and proportions of each species in the total catch are shown.

STECF 2012 data. Swedish grid. KATTEGAT SEA							
FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	274,393	99,03	227,089	45,28	501,482	63,05
DAB	Dab	0,032	0,01	178,588	99,98	178,62	22,46
WHG	Whiting	0,124	0,04	35,233	99,65	35,357	4,45
FLX	Flounder	0,275	0,10	24,256	98,88	24,531	3,08
PLE	*Plaice*	1,018	0,37	19,273	94,98	20,291	2,55
COD	Cod	0,126	0,05	12,069	98,97	12,195	1,53
LEM	Lemon sole	0,061	0,02	6,469	99,07	6,53	0,82
HKE	Hake	0,05	0,02	6,073	99,18	6,123	0,77
SOL	Sole	0,397	0,14	4,623	92,09	5,02	0,63
WIT	Witch	0,15	0,05	3,973	96,36	4,123	0,52
HER	Herring	0,043	0,02	0,405	90,40	0,448	0,06
CAT	Cat	0,3	0,11			0,3	0,04
TUR	Turbot	0,081	0,03	0,193	70,44	0,274	0,03
CRE	Edible crab	0,03	0,01			0,03	0,004
TOTAL		**277,08**	100	**518,244**	**N/A**	**795,324**	**100**

(Source: STECF website)

Table 7 2012 catch composition of Skagerrak Seltra trawl fishery

Data from STECF website. Landings (tonnes), discards (tonnes), discard ratio per species and proportions of each species in the total catch are shown.

2012 data. Danish SELTRA gear. SKAGERRAK SEA.							
FAO Code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	1494,456	21,06	911,495	37,9	2405,951	22,7852
COD	Cod	1020,995	14,39	1120,815	52,3	2141,81	**20,2837**
HAD	Haddock	815,534	11,49	507,914	38,4	1323,448	**12,5335**
POK	Saithe	1238,848	17,46	40,235	3,1	1279,083	**12,1134**
PLE	Plaice	839,763	11,83	120,455	12,5	960,218	**9,0936**
WIT	Witch	749,98	10,57	165,687	18,1	915,667	**8,6717**
HKE	Hake	199,323	2,81	76,786	27,8	276,109	2,6148
DAB	Dab	131,291	1,85	95,918	42,2	227,209	2,1517
ANF	Anglerfish	199,331	2,81	0,439	0,2	199,77	1,8919
PLA	American Plaice	0,036	0,00	178,869	**99,97**	178,905	**1,6943**
LEM	Lemon sole	153,372	2,16	14,262	8,5	167,634	1,5876
WHG	Whiting	21,896	0,31	99,586	82	121,482	1,1505
RAJ	Rays and skates	11,869	0,17	82,93	87,5	94,799	0,8978
LIN	Ling	51,48	0,73	3,125	5,7	54,605	0,5171
SOL	Sole	52,02	0,73	0,252	0,5	52,272	0,4950
POL	Pollack	51,416	0,72	0,111	0,2	51,527	0,4880
TUR	Turbot	26,122	0,37	0,401	1,5	26,523	0,2512
DGS	Squalus acanthias	11,49	0,16	6,037	34,4	17,527	0,1660
HER	Herring	0,104	0,00	12,049	**99,1**	12,153	**0,1151**
CRE	Edible crab	3,515	0,05	7,661	68,5	11,176	0,1058
FLX	Flounder	2,596	0,04	7,433	74,1	10,029	0,0950
LUM	Lumpfish	3,864	0,05	5,065	56,7	8,929	0,0846
HAL	Atlantic halibut	6,499	0,09	0	0	6,499	0,0615
CAT	Catfish	4,963	0,07	0,701	12,4	5,664	0,0536
CMO	Rabbitfish	0,018	0,00	4,241	**99,6**	4,259	**0,0403**
MAC	Atlantic mackerel	3,404	0,05	0,557	14,1	3,961	0,0375
RED	Atlantic redfish	0,587	0,01	0	0	0,587	0,0056
RNG	Roundnose grenadier	0,235	0,00	0,263	52,8	0,498	0,0047
USK	Tusk	0,477	0,01	0	0	0,477	0,0045
JAX	Jack and horse mackerels	0,209	0,00	0,035	14,3	0,244	0,0023
BLI	Blue ling	0,145	0,00	0	0	0,145	0,0014
SFV	Norway redfish	0,076	0,00	0	0	0,076	0,0007
GAG	Tope shark	0,045	0,00	0	0	0,045	0,0004
TOTAL		**7095,959**	**100**	**3463,322**	**N/A**	**10559,281**	**100**

(Source: STECF website)

Table 8 2012 catch composition of Kattegat Seltra trawl fishery

Data from STECF website. Landings (tonnes), discards (tonnes), discard ratio per species and proportions of each species in the total catch are shown.

STECF 2012 data. Danish SELTRA gear. KATTEGAT SEA							
FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	1350,869	74,92	1972,222	59,3	3323,091	46,93257
DAB	Dab	31,667	1,76	1434,748	97,8	1466,415	20,71042
HER	Herring	10,299	0,57	1025,905	99	1036,204	14,63448
PLE	Plaice	136,954	7,60	313,589	69,6	450,543	6,36309
COD	Cod	49,001	2,72	104,15	68	153,151	2,16298
CRE	Edible crab	1,607	0,09	128,953	98,8	130,56	1,84392
WHG	Whiting	4,901	0,27	123,61	96,2	128,511	1,81498
FLX	Flounder	46,58	2,58	80,309	63,3	126,889	1,79207
SOL	Sole	102,579	5,69	2,209	0,02	104,788	1,47994
LEM	Lemon sole	10,49	0,58	21,543	67,3	32,033	0,45241
HKE	Hake	6,885	0,38	23,073	77	29,958	0,42310
TUR	Turbot	12,759	0,71	6,62	34,2	19,379	0,27369
SPR	Sprat	14,041	0,78	2,241	13,8	16,282	0,22995
WIT	Witch	9,02	0,50	6,524	42	15,544	0,21953
PLA	American Plaice	0,004	0,00	15,371	100	15,375	0,21714
RAJ	Rays and skates	3,21	0,18	7,334	69,6	10,544	0,14891
HAD	Haddock	3,93	0,22	4,345	52,5	8,275	0,11687
MAC	Atlantic mackerel	1,46	0,08	1,101	43	2,561	0,03617
JAX	Jack and horse mackerel	0,175	0,01	2,103	92,3	2,278	0,03217
CAT	Cat	2,051	0,11	0	0	2,051	0,02897
POK	Saithe	1,14	0,06	0,198	14,8	1,338	0,01890
LIN	Ling	1,141	0,06	0,097	7,8	1,238	0,01748
POL	Pollock	1,084	0,06	0	0	1,084	0,01531
ANF	Anglerfish	0,621	0,03	0,344	35,6	0,965	0,01363
LUM	Lumpfish	0,15	0,01	0,565	79	0,715	0,01010
NOP	Norway pout	0,215	0,01	0,409	65,5	0,624	0,00881
HAL	Atlantic halibut	0,135	0,01	0	0	0,135	0,00191
RED	Atlantic redfish	0,032	0,00	0	0	0,032	0,00045
BSS	European seabass	0,002	0,00	0	0	0,002	0,00003
TOTAL		**1803,002**	**100**	**5277,563**	**N/A**	**7080,565**	**100**

(Source: STECF website)

Table 9 2012 catch composition of Swedish Skagerrak Sea creel fishery. Data from STECF website. Landings (tonnes) and catch composition proportions are shown. No discards are recorded.

STECF 2012 data. SW Skagerrak creels. 2012			
Species		Landings (Tonnes)	% of Total Catch
NEP	Nephrops	177,366	93,33
CRE	Edible crab	10,506	5,52
COD	Cod	1,242	0,65
LIN	Ling	0,433	0,22
CAT	Catfish	0,28	0,14
WHG	Whiting	0,122	0,06
DAB	Dab	0,08	0,04
POK	Saithe	0,001	0,01
POL	Pollack	0,005	0,002
HER	Herring	0,002	0,001
TOTAL		**190,037**	**100**

(Source: STECF website)

Table 10 2012 catch composition of Swedish Kattegat Sea creel fishery. Data from STECF website. Landings (tonnes) and catch composition proportions are shown. No discards are recorded.

STECF 2012 data. Swedish creels in the Kattegat Sea.			
FAO code	Species	Landings (Tonnes)	% of Total Catch
CRE	Edible crab	6,95	45,10
NEP	Nephrops	8,46	54,90
TOTAL		15,41	100

(Source: STECF website)

3.4.1 Retained catch

Retained species are those that have been caught and landed together with Nephrops, the (target) species under assessment, regardless of the landed volume. The volumes of the main retained species landed for the different Units of Certification are shown in Tables 11- 16 for the Swedish grid trawling gear , the Danish Seltra trawling gear and the Swedish creel fishery, all of them in the Skagerrak and the Kattegat seas.

Data have been analysed based on STECF 2012 data for landings by Swedish and Danish vessels, aggregated by year and gear type and fishing area. The team considers that main retained species are those landed species where catch composition proportions are above 5% of the total catch. In addition, cod is always considered as a main retained species due to its commercial importance and its poor stock status.

3.4.1.1 Swedish grid

The Swedish grid under assessment in Units of Certification 1 and 2 only lands Nephrops and a small proportion of cod when caught. Tables 11 and 12 show main retained species for the Swedish grid in the Skagerrak and Kattegat Seas. (Note that whilst dab constitutes over 20% of the total catch in the fishery using the Swedish grid in the Kattegat, UoC2, almost all the catch is discarded and in consequence dab is considered as a main bycatch species in the assessment of this UoC.)

Table 11 Unit of certification 1. Live weight (Tonnes) and proportion of total catch of retained species in the Swedish grid fishery in the Skagerrak Sea. 2012. Species in bold in green shaded cells represent main retained species.

STECF 2012 data. Swedish grid. Skagerrak Sea.							
FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of total catch
NEP	Nephrops	443,845	99,16	574,824	56,43	1018,669	90,47
COD	**Cod**	0,054	0,01	10,733	99,50	10,787	0,96
Total main retained species		**443,899**	**99,17**	**585,557**	**N/A**	**1029,456**	**91,43**
TOTAL (all retained species)		**447,623**	**100**	**678,304**	**N/A**	**1125,927**	**100**

(Source: STECF 2012 data)

Table 12 Unit of certification 2. Live weight (Tonnes) and proportion of total catch of retained species in the Swedish grid fishery on the Kattegat Sea. 2012. Species in bold in green shaded cells represent main retained species.

STECF 2012 data. Swedish grid. Kattegat Sea.							
FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total catch
NEP	Nephrops	274,393	99,03	227,089	45,28	501,482	63,05
COD	**Cod**	0,126	0,05	12,069	99,98	12,195	1,53
Total main retained species		274,519	99,07	239,158	46,56	513,677	64,59
TOTAL (all retained species)		**277,08**	**100**	**518,244**	**N/A**	**795,324**	**100,00**

(Source: STECF 2012 data)

3.4.1.2 Seltra gear

The vessels using Seltra gear (under assessment in Units of Certification 3, 4, 7 and 8) operate more of a mixed fishery targeting Nephrops along with other species. Units of certification 3 and 4 consider Swedish vessels in the Skagerrak and in the Kattegat Sea respectively, meanwhile Units of Certification 7 and 8 correspond to Danish vessels also in the Skagerrak and in the Kattegat Sea. As the gear was very recently introduced in the Swedish fisheries, the team will consider Danish data as a precautionary approach to the fishery's catch composition.

Table 13 Unit of certification 3. Live weight (Tonnes) and proportion of total catch of retained species in the Danish fishery on the Skagerrak Sea before the seltra implementation (February 2013). Species in bold in green shaded cells represent main retained species.

(Source: STECF 2012 data)

STECF 2012 data. Danish SELTRA gear. Skagerrak Sea.							
FAO Code	Main retained Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of Catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	1494,456	21,06	911,495	37,9	2405,951	22,79
COD	**Cod**	1020,995	14,39	1120,815	52,3	2141,81	20,28
HAD	**Haddock**	815,534	11,49	507,914	38,4	1323,448	12,53
POK	**Saithe**	1238,848	17,46	40,235	3,1	1279,083	12,11
PLE	**Plaice**	839,763	11,83	120,455	12,5	960,218	9,09
WIT	**Witch**	749,98	10,57	165,687	18,1	915,667	8,67
Total main retained species		6159,576	86,80	2866,60	N/A	9026,177	85,48
TOTAL (All retained species)		**7095,959**	**100**	**3463,322**	**N/A**	**10559,281**	**100**

Table 14 Unit of certification 4. Live weight (Tonnes) and proportion of retained species in the Danish seltra fishery in the Kattegat Sea. 2012. (The seltra gear was implemented in the Kattegat Sea in July 2011 by the Danish vessels) Species in bold in green shaded cells represent main retained species.

STECF 2012 data. Danish SELTRA gear. KATTEGAT SEA							
FAO code	Retained spp	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	1350,869	74,92	1972,222	59,3	3323,091	46,93
DAB	**Dab**	31,667	1,76	1434,748	97,8	1466,415	20,71
HER	**Herring**	10,299	0,57	1025,905	99	1036,204	14,63
PLE	**Plaice**	136,954	7,60	313,589	69,6	450,543	6,36
COD	**Cod**	49,001	2,72	104,15	68	153,151	2,16
Total main retained spp		1578,79	87,56	4850,614	N/A	6429,404	90,80
Total (All retained spp)		**1803,002**	**100**	**5277,563**	**N/A**	**7080,565**	**100**

(Source: STECF 2012 data)

3.4.1.3 The creel fisheries

The creel fisheries under assessment in Units of Certification 5 and 6 are a very selective gear targeting Nephrops. Vessels working with this gear are normally considered to be an artisanal fleet due to the small size of the vessels and the low catches of each vessel. Units of certification 5 and 6 consider Swedish vessels in the Skagerrak and in the Kattegat Sea respectively.

Table 15 Unit of certification 5. Live weight (Tonnes) and proportion of retained species in the Swedish creel fishery in the Skagerrak Sea. 2012. Species in bold in green shaded cells represent main retained species.

STECF 2012 data. SW Skagerrak creels. 2012			
Species		Landings (Tonnes)	% of Total Catch
NEP	Nephrops	177,366	93,33
CRE	**Edible crab**	10,506	5,52
COD	**Cod**	1,242	0,65
Minor retained species		0,923	0,5
TOTAL		**190,037**	**100**

(Source: STECF 2012 data)

Table 16 Unit of certification 6. Live weight (tonnes) and proportions of retained species in the Swedish creel fishery in the Kattegat Sea. 2012. Species in bold in green shaded cells represent main retained species.

STECF 2012 data. Swedish creels in the Kattegat Sea.			
FAO code	Species	Landings (Tonnes)	% of Total Catch
CRE	**Edible crab**	6,95	45,10
NEP	Nephrops	8,46	54,90
TOTAL		15,41	100

(Source: STECF 2012 data)

3.4.1.4 Stock status and management of main retained species

Cod: ICES gives two different advices for cod in the Skagerrak and Kattegat regions.

In 2008 the EU and Norway renewed their initial agreement from 2004 and "agreed to implement a long-term management plan for the cod stock, which is consistent with the precautionary approach and is intended to provide for sustainable fisheries and high yield leading to a target fishing mortality of 0.4." This plan was reconsidered in February 2013, but no modification was implemented. It was previously evaluated by ICES (ICES, 2012) and considered to be consistent with the precautionary approach in the short term (< 4 years).

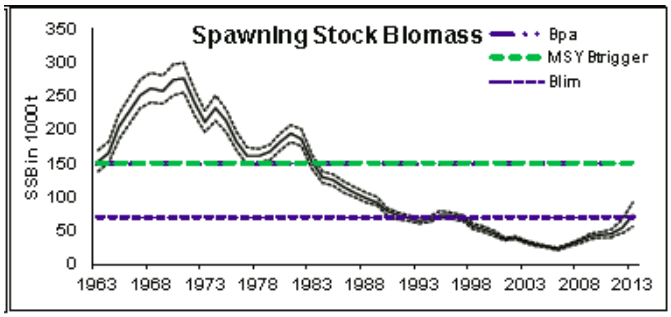
The EU has adopted a long-term plan for this stock with the same aims (Council Regulation (EC) 1342/2008; Annex 6.4.3). In addition to the EU–Norway agreement, the EU plan also includes effort restrictions, reducing kW-days available to community vessels in the main metiers catching cod in direct proportion to reductions in fishing mortality until the long-term phase of the plan is reached, for which the target F is 0.4 if SSB is above Bpa. In 2013, there has been no reduction in effort ceilings compared to the preceding year.

ICES 2013 advice for cod in the North Sea and the Skagerrak states that there has been a gradual improvement in the status of the stock over the last few years.

SSB has increased from the historical low in 2006 and is now in the vicinity of Blim, but target reference points are not reached yet. Fishing mortality declined from 2000 and is now estimated to be around 0.4, between Fpa and the FMSY proxy. Recruitment since 2000 has been poor. ICES estimates total catch (2012) at around 43.6 kt, with 33.2 kt estimated landings (58% demersal trawls and seines >100 mm, 11% gillnets, 9% Nephrops trawls, 6% beam trawls, and 16% other gears) and 10.4 kt estimated discards.

ICES advise on the basis of the EU–Norway management plan that landings in 2014 should be no more than 28 809 tonnes. If discards rates do not change from those in 2012, this implies catches of no more than 37 496 tonnes for the North Sea (excluding Kattegat).

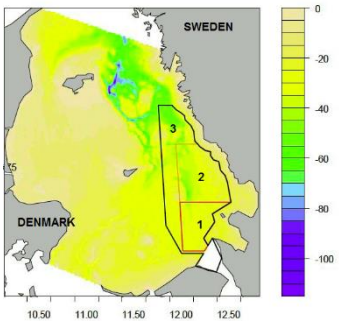
Figure 16 Historical trend of Spawning Stock Biomass for cod in the Skagerrak



Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf

Kattegat cod is in a much poorer condition. Spatial and temporal fishing area closures were implemented in the Kattegat in January 2009 to reduce fishing mortality on cod. Three closed areas were introduced in the Kattegat Sea, where fishing is prohibited (seasonally or during the complete year) in order to protect fish stocks, specifically cod that could benefit from area closures.

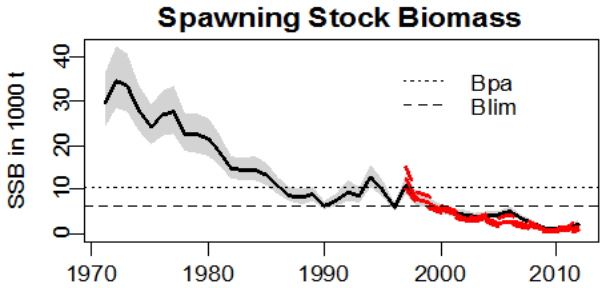
Figure 17 Bathymetry of Kattegat and closed areas.



(Source: Evaluation of closed areas in Kattegat to promote the rebuilding of the cod stock.)

ICES 2013 advice for cod in the Kattegat states that new data available for this stock do not change the perception of the stock. Therefore, the advice for this fishery in 2014 is the same as the advice for 2013 (see ICES, 2012): "ICES advises on the basis of precautionary considerations that there should be no directed fisheries and bycatch and discards should be minimised". In 2013, the cod quota is assumed to be restricted to a bycatch quota. The quota has not been limiting the fisheries in recent years. There are some concerns that the low current quota could be reached before the end of the year and hence increase the discard rate of cod. However this was not the case in 2013 with only 79% of the quota being taken up.

Figure 18 Historical trend of Spawning Stock Biomass for cod in the Kattegat



(Source: ICES, 2012).

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

For the Kattegat Sea, measures have not been as effective as expected as SBB is still below Blim, and ICES advises on the basis of precautionary considerations that there should be no directed fisheries and bycatch and discards should be minimized.

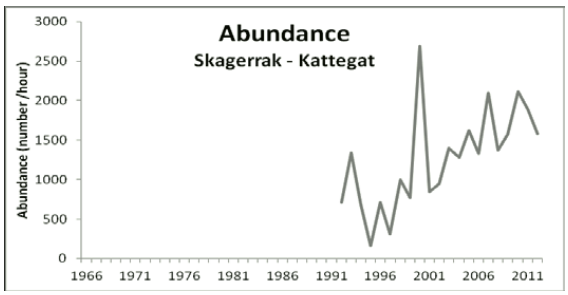
Dab: Common ICES advice both for the Skagerrak and Kattegat regions.

ICES advice for dab is provided under a mixed precautionary TAC with flounder. The mixed TAC for EU waters of area IIa and IV together with flounder reduces the accuracy of catch statistics per species. Landings data of dab in the North Sea (Skagerrak and Kattegat) are not complete, and are not indicative of catches. Discards should be estimated and added to the landings. The survey indices need to be available as biomass indicators rather than abundance.

For data limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted status-quo catch. The advice is based on a comparison of the three most recent index values with the five preceding values, combined with recent landings data. Knowledge about the exploitation status also influences the advised catch. The stock size indicator (number/hour) in the last three years (2010–2012) is 16% higher (Skagerrak–Kattegat) than the average of the five previous years (2005–2009).

ICES Advice for Dab (2013) shows an increment of the abundance for the last 15 years in IIIa, but still there´s not enough information to give catch advice and no reference points have been defined. WG NEW (2013) suggests dab abundance is increasing, but no biologically based limits are set.

Figure 19 Historical trend for dab abundance in the Skagerrak and Kattegat Seas



Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/dab-nsea.pdf

Edible crab: Both for the Skagerrak and Kattegat regions.

According to Annete Ungfors Doctoral Thesis (2008) "Fisheries biology of the edible crab (*Cancer pagurus*) in the Kattegat and the Skagerrak. Implications for sustainable management", http://www.gu.se/forskning/publikation/?publicationId=112249 , the average density of crabs (in the Fjällbacka archipelago) was estimated to be 0.0038 ± 0.0015 crabs/m2. The area of suitable crab habitat in the Swedish part of the Skagerrak and Kattegat, between 10 and 40 meters water depth, and with a bottom consisting of bedrock, stone, gravel or sand, was estimated to 4142 km2. This suitable crab habitat combined with the density estimates from Fjällbacka would indicate that the catchable population of crabs on the Swedish west coast would be approximately 10-22 million (95 % confidence interval) crabs. The stock biomass of edible crabs available for the Swedish fishermen in Kattegat and Skagerrak is estimated to 4-8 million edible crab or 1600-2600 tonnes. This stock estimate is based on official data on the Swedish commercial landings and estimated recreational landings, i.e. approx. 400 tonnes in total, and is highly dependent on the total landings and on the input values of growth parameters and natural mortality.

The status of the edible crab stock in the Kattegat and the Skagerrak appears to be good. Fishing mortality is low and no trend (decreasing or increasing) in logbooks landing per unit effort (LPUE) can been seen over the last 13 years. Since 2004, using landings and effort data from logbooks for vessels > 10 m, the LPUE is on average around 2.0-2.5 kg/pot.

Haddock (in the Skagerrak region)

ICES 2013 advice for Haddock in Division IIIa West (Skagerrak) shows that fishing mortality has been below Fpa and around the FMSY proxy, and SSB has been above MSY Btrigger since 2001. Occasional large year classes, the last of which was the strong 1999 year class, characterize recruitment. Apart from the 2005 and 2009 year classes, which are about average, recent recruitment has been poor.

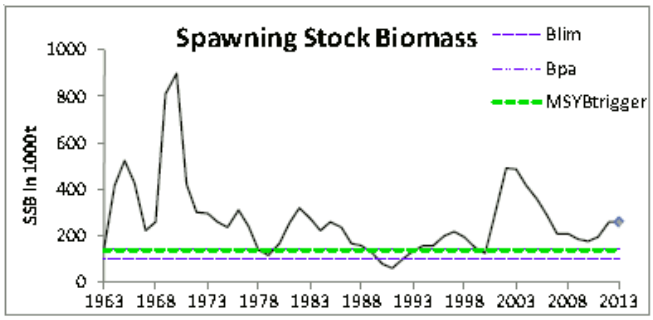
In 2008 the EU and Norway agreed a revised management plan for this stock, which states that every effort will be made to maintain a minimum level of SSB greater than 100 000 t (Blim). Furthermore, fishing was restricted on the basis of a TAC consistent with a fishing mortality rate of no more than 0.30 for appropriate age groups, along with a limitation on interannual TAC variability of ±15%. Following a minor revision in 2008, interannual quota flexibility ("banking and borrowing") of up to ±10% is permitted (although this facility has not yet been used). The EU and Norway have adhered to the stipulations of the management plan since its implementation in January 2007. ICES has evaluated the plan and concludes that it can be accepted as precautionary.

Following the agreed management plan implies fishing at the target rate of 0.3, which results in a TAC (Human Consumption landings) reduction of more than 15%. Therefore, the maximum TAC reduction of 15% is applied, resulting in human consumption landings of no more than 40 639 t in 2014. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010–2012), this implies catches of no more than 45 318 t.

This advice implies a reduction in TAC (15%) and increase in F (71%) which is due to the absence of young fish recruiting to the population, and hence a predicted decline in spawning-stock biomass. The possibility of extended periods of low recruitment was accounted for in the 2008 evaluation of the management plan that was deemed to be sustainable.

Following the ICES MSY approach implies fishing mortality to be increased to 0.3, resulting in a TAC (Human Consumption landings) of no more than 37 146 t in 2014. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010–2012), this implies catches of no more than 41 418 t. This is expected to lead to an SSB of 204 000 t in 2015.

Figure 209 Historical trend of Spawning Stock Biomass for haddock



(Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/had-34.pdf)

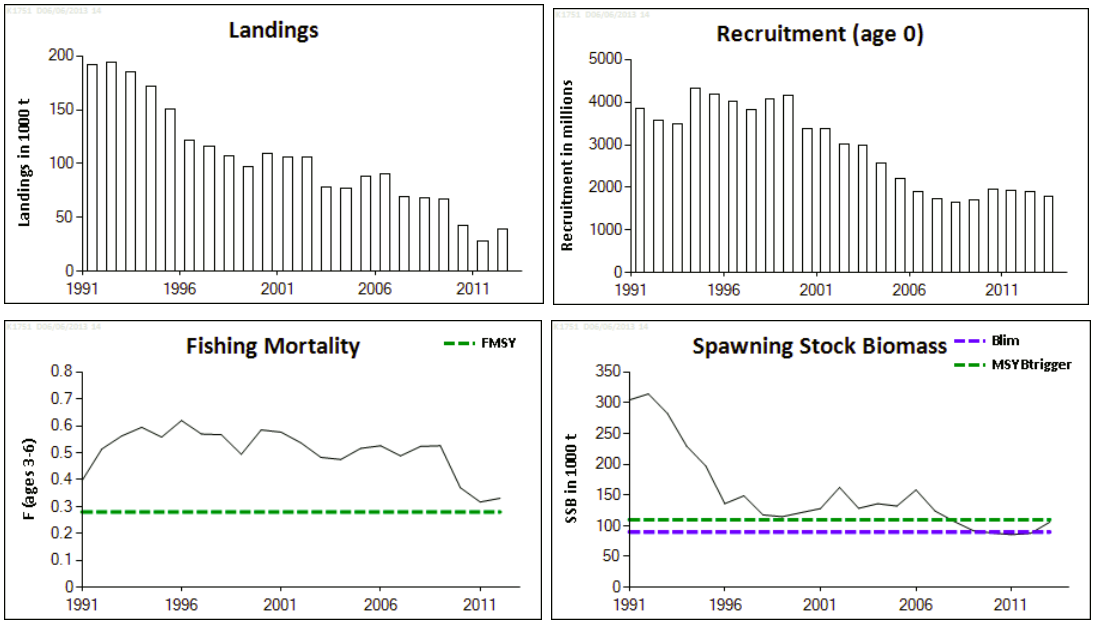
Herring: Both for the Skagerrak and Kattegat regions.

ICES 2013 advice for herring in Division IIIa estimates that SSB has decreased in recent years, reaching the lowest in the time-series in 2011 at between BPA and Blim. Fishing mortality has been at its lowest in the recent years, but it is still above FMSY in 2012. The stock appears to remain in a low production period; however, recruitment is estimated with high uncertainty.

ICES knows of no specific management objectives. Following the revision of the reference points, these can now be used for the development of a management plan. ICES recommends developing such a plan. The previous evaluations were based on a different perception of stock dynamics and need to be revisited.

All catches are assumed to be landed.

Figure 21 Historical trends of landings, recruitment, spawning stock biomass and fishing mortality for herring.



Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf

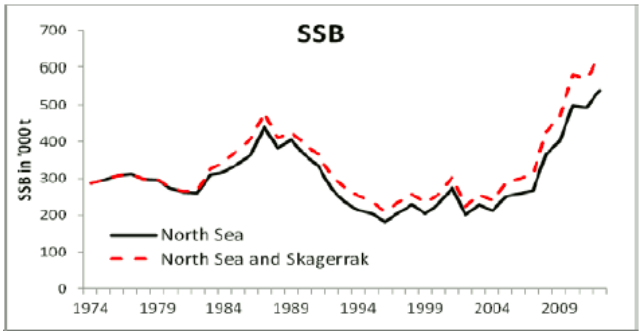
Plaice: There are 3 different ICES advice for the Western Skagerrak, Eastern Skagerrak and the Kattegat Seas.

Plaice in Skagerrak is considered to be closely associated with plaice in the North Sea, although local components are present in the area.

In Skagerrak, plaice is taken all year round, mainly in a directed fishery by seiners, gillnetters, and small coastal vessels, but also in a mixed trawl fishery together with cod and Nephrops. Nearly all catches are now taken in the Western area, while plaice by-catches in the targeted Nephrops fishery in the Eastern area have dropped to very low levels with the increased adoption of more selective gears.

For the **Western component** (where nearly all catches take place) the biomass in the last three years (2011–2013) is 7% higher than the average of the five previous years (2006–2010). This implies an increase of landings of at most 7% in relation to the last three years average landings, corresponding to landings of no more than 8972 t. Even though exploitation status is unknown, the effort of the main fleets with plaice catches has declined substantially (−41% between 2003 and 2012). For trawling and Danish seines (all mesh sizes) a reduction in 40% effort was recorded. Therefore no additional precautionary reduction of catches is needed. If discards rates do not change from the rate of the last year (2012), this implies catches of no more than 10 196 t. Discard mortality is assumed to be 100%.

Figure 22 Historical trend of Spawning Stock Biomass for plaice in the Skagerrak



Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf

Conversely, in **the Eastern component**, the biomass is considered depleted. The biomass in the last three years (2011– 2013) is 19% lower than the average of the five previous years (2006–2010). Catches in the Eastern area are very low (under 1% of the Skagerrak catches in 2012), but the actual exploitation rate is uncertain due to the reduced stock status. Therefore, no directed fisheries should occur and bycatch and discards should be minimized.

Figure 23 Qualitative evaluation of SSB for plaice in the Skagerrak

SSB (Spawning-Stock Biomass)		
	2008–2013	
Qualitative evaluation	West ↗	West: stable/increasing
	East ↘	East: decreasing and low

Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf

Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 8972 tonnes. If a discard ban is implemented, ICES advises on the basis of the ICES approach for data-limited stocks that catches should be no more than 10 196 tonnes.

Previously, plaice TACs were set for Kattegat and Skagerrak separately but with a fixed allocation key between the two areas, based on advice for the entire Division IIIa. Catches in Kattegat have dropped over time, while conversely the TAC in Skagerrak became increasingly restrictive as LPUE have increased in the recent years. From 2012 onwards ICES has provided separate advice for Kattegat and Skagerrak.

Effort restrictions in the EC were introduced in 2003 (annual annexes to the TAC regulations) for the protection of the cod stock in North Sea, Skagerrak and Eastern Channel. In 2009, the management programme switched from a days-at- sea to a kW-day system (2009 Council Regulation (EC) N° 43/2009), in which different amounts of kW-days are allocated within each area by member state to different groups of vessels, depending on gear and mesh size. Effort ceilings are updated annually.

Overall nominal effort (kW-days) in the Skagerrak has been substantially reduced (−41% between 2003 and 2012). For trawling and Danish seines (all mesh sizes) a reduction in 40% effort was recorded. A substantial amount of the Danish plaice fishery in Skagerrak is operated under a Fully Documented Fishery scheme (20% in 2012, mainly Danish seiners).

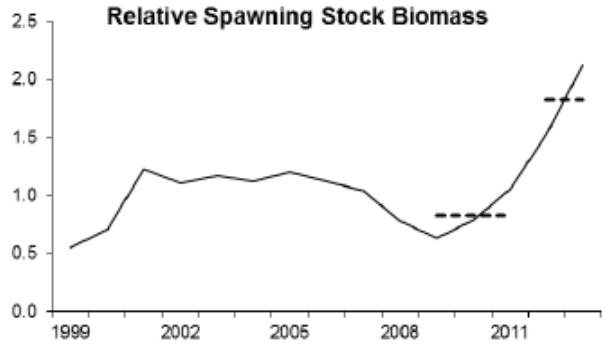
No reference points are defined for plaice in the Skagerrak.

For the stock of **plaice in the Kattegat**, the exploratory assessment shows that fishing mortality has dropped since 2006, and SSB has been increasing since 2009. The SSB in the last two years (2011–

2012) is 76% higher than the average of the three previous years (2008–2010). The fishing mortality in 2012 is estimated to be 0.16, below FMSY proxy. The fishing in 2014 could therefore be increased by 56% to explore the stock at FMSY. Since the product of 1.16 and 1.56 (SSB and fishing mortality increase) is larger than 1.2, this implies an increase of landings of at most 20% in relation to last year's landings, corresponding to landings in 2013 of no more than 2224 t. Discards are known to take place but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore, total catches cannot be calculated. ICES knows of no specific management objectives for the Kattegat plaice.

Plaice is caught all year round, mainly from winter to spring. In Subdivision (SD) 22 plaice are mostly taken in mixed fisheries together with cod. In SD 21 plaice is almost exclusively a bycatch in the combined Nephrops–sole fishery. Information on discard ratios in SDs 21–23 is around 15–25% in weight. Discards peak in the Kattegat from 1st of February to 30th April, when landing of mature females is prohibited.

Figure 24 Historical trend of Relative Spawning Stock Biomass for plaice in the Kattegat.



(Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-2123201304142222.pdf)

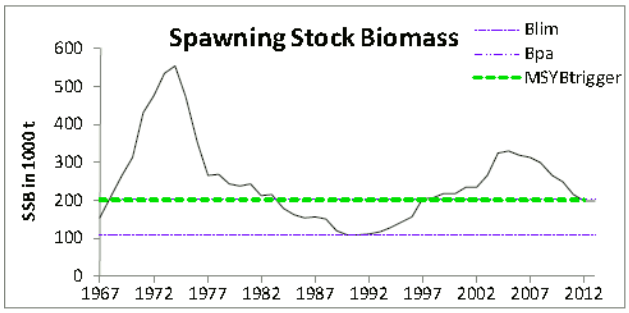
Saithe in the Skagerrak

ICES 2013 Advice for saithe in the Skagerrak advices on the basis of the EU–Norway management plan, that landings in 2014 should be no more than 85.581 tonnes for the whole assessment area.

SSB increased above Bpa in 1997, but has declined 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.

Since SSB at the beginning of 2013 is below Bpa, paragraph 3 of the harvest control rule applies, resulting in a F of 0.29 and a TAC (landings) reduction of more than 15%.s Therefore, the maximum TAC reduction of 15% is applied (paragraph 5), resulting in landings of no more than 85 581 t in 2014. This is expected to lead to an SSB of 176 099 t in 2015, which is below Bpa. Discards are known to take place and are expected to be high in the mixed fisheries, but cannot be quantified; therefore total catches cannot be calculated.

Figure 25 Historical trend of Spawning Stock Biomass for saithe.



(Source: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/sai-3a46.pdf)

Witch: Common ICES advice both for the Skagerrak and Kattegat regions.

Witch is an important bycatch in some Nephrops fisheries. There is an occasional directed fishery in the Skagerrak. There is no Minimum Landing Size (MLS) specified in EU waters. However, on a local level a minimum landing size of 28 cm is enforced in Denmark and Sweden.

The effort of the main fleet with witch bycatches (otter trawls) in the North Sea and Skagerrak has declined by 14% (TR1) and 45% (TR2) between 2004 and 2012. In the Skagerrak, a similar decrease was seen for TR2, which is the main fleet in this area. At the same time, there is indication from a preliminary assessment that the stock may be overexploited. Concluding, there is uncertainty on the exploitation rate on witch, therefore ICES advises that landings should decrease by 20% as a precautionary buffer. This results in landings of no more than the last three years average landings of 1574 t in 2014.

ICES 2013 advice for witch in Division IIIa cannot present an analytical assessment, mainly due to a lack of sufficiently long datasets. Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 1574 tonnes. Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

Landings have declined in the last decade, but the 2012 landings in IIIa show an increase. Abundance indices show a declining trend since the peak observed in 2000 and an increase in recent years. The stock size indicator (number/hour) in the last three years (2011–2013) is more than 20% higher than the average of the five previous years (2006–2010) for both surveys. Exploratory estimates suggest that fishing mortality is above potential FMSY proxies.

There are no specific management objectives for witch known to ICES. An EU TAC is set for EU waters of area IIa and IV together with lemon sole witch (ICES, 2013a), but TACs may not be appropriate as a management tool for bycatch species. Discard rates for witch are unknown but are potentially important to the assessment.

3.4.2 Bycatch

All vessels operating the fishery have measures in place that are designed specifically to reduce or eliminate discarding within fisheries. The European ban on high grading, which came into force on 1st January 2010, acts to minimize discarding across Skagerrak and Kattegat fisheries. The Norwegian ban on discarding is also applicable for Danish and Swedish vessels fishing in the Skagerrak Sea within the Norwegian EZ. There are closed areas including Real Time Closures specifically designed to protect nursing grounds of cod.

Bycatch species are those that have been caught and discarded while targeting Nephrops, the species under assessment.

The catch composition proportions for UoC1 (see Table 5) show that there are no main bycatch species to study under this UoC. For UoC2 (see Table 6) the team will consider dab as a main bycatch species, because of its extremely high rate of discards (99.98%), and high proportion of the total catch composition (20%). All other discarded species represent less than 5% from the total catch composition. As dab stock status and management has already been studied under the retained species section, that information is not repeated here.

As Tables 7 and 8 show, the seltra gear operates in a mixed fishery targeting (and landing) different species, to a greater or lesser extent. For this reason, the team will not consider any main bycatch species for UoC3 or UoC4. However, 2 tonnes of spurdog were caught by the Danish seltra fishery in the Skagerrak and Kattegat Seas during 2012 (see Tables 24 to 27). As spurdog is a species of special concern it will be considered as a minor bycatch specie in the seltra UoC.

Spurdog

Spurdog is seriously depleted in the OSPAR Area and the stock may be in danger of collapse as a result of unsustainable removal in former target fisheries (ICES WGEF 2008). While most target fisheries for spurdog collapsed over the past decade, its aggregating habit made this sensitive species highly vulnerable to localised, seasonal fisheries. Until recent years, retention of by-catch from mixed fisheries has also been unrestricted. Recent stock assessments for spurdog in the North- East Atlantic (e.g. Heesson 2003, Hammond and Ellis 2004, ICES WGEF 2006) estimated very low stock status for this onetime highly abundant species.

Continued target fishing and retention of bycatch since the above stock assessments are likely to have reduced the stock further and the North-East Atlantic population is presently listed as Critically Endangered in the IUCN Red List (Fordham et al. 2006). Recovery requires fishing pressure on this stock to be minimised. Spurdog no longer has a Total Allowable Catch (set at 0 tonnes) and there is no provision for landing bycatch as in previous years. Accordingly, a directed spurdog fishery is no longer permitted and all spurdog must be returned alive to the sea in European waters, while the discard ban on Norwegian waters obliges to retain on board all catches.

No bycatch appears in the STECF database regarding the creel fishery. The creel fishery under assessment in Units of Certification 5 and 6 (Skagerrak and Kattegat Sea respectively) are a very selective gear targeting Nephrops.

Data from Ungfors et al., 2013. "Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64". (Page 280) on research and trials in the creel fishery show the following catch composition: 90 % of Nephrops (of which 75% are above MLS and 15% under MLS, therefore, discarded), and a 10% of miscellanea fish, which are discarded. Both undersized Nephrops and the various fish (of which many are poor cod *Trisopterus minutus*) are discarded at the point of capture with a very high survival rate, as the animals don´t get harmed during their interaction with the creel.

The team considers main bycatch species those with a catch proportion of 5% or more that have not been considered as a retained species.

Despite the lack of additional 'main' discarded species under assessment, the team would like to highlight the high discard rate in these fishing gears. Discard proportions are shown in Tables 17 to 20. All these data come from STECF 2012 data.

Table 17 Landing and discard proportions of the Swedish grid gear in the Skagerrak Sea.

SW grid. Skagerrak Sea. 2012	
Total catch (Tonnes)	1125,927
Landings (Tonnes)	447,623
Discards (Tonnes)	678,304
% Discards	**60,24**
% Landings	39.76

(Source: STECF 2012 data)

Table 18 Landing and discard proportions of the Swedish grid gear in the Kattegat Sea.

SW grid. Kattegat Sea. 2012	
Total catch (Tonnes)	795,324
Landings (Tonnes)	277,08
Discards (Tonnes)	518,244
% Discards	**65,16**
% Landings	34,83

(Source: STECF 2012 data)

Table 19 Landing and discard proportions of the Danish seltra gear in the Skagerrak Sea.

DK seltra. SKA. 2012	
Total catch (Tonnes)	10559,281
Total landings (Tonnes)	7095,959
Total discards (Tonnes)	3463,322
% Discards	**32,79**
% Landings	67,20

Source: STECF 2012 data

Table 20 Landing and discard proportions of the Danish seltra gear in the Kattegat Sea.

DK seltra. Kattegat Sea 2012.	
Total catch (Tonnes)	7080,565
Total landings (Tonnes)	1803,002
Total discards (Tonnes)	5277,563
% Discards	**74,53**
% Landings	25,46

Source: STECF 2012 data

3.4.2.1 Swedish grid

The Swedish grid under assessment in Units of Certification 1 and 2 only lands Nephrops and a small proportion of other species when caught. The rest of the catch is normally discarded as bycatch.

Tables 21 and 22 show discards proportions for the Swedish grid fisheries in the Skagerrak and Kattegat Seas for UoC1 and UoC2. Data have been obtained from the STECF 2012 database.

Table 21 Landing and discard proportions for UoC1. There are no main bycatch species to consider.

STECF 2012 data. Swedish grid. Skagerrak Sea.						
FAO code	Species	Landings (Tonnes)	Discards (Tonnes)	% Discards	Total catch (Tonnes)	% Total catch
DAB	Dab	0,088	34,945	99,75	35,033	3,11
PLE	Plaice	0,801	19,514	96,06	20,315	1,80
FLX	Flounder	0,115	10,381	98,90	10,496	0,93
WIT	Witch	0,071	9,586	99,26	9,657	0,86
WHG	Whiting	0,931	6,864	88,06	7,795	0,69
HKE	Hake	0,086	4,105	97,95	4,191	0,37
SRX	Rays, stingrays and mantas	0,005	2,338	99,79	2,343	0,21
HAD	Haddock	0,042	2,04	97,98	2,082	0,18
LEM	Lemon sole	0,077	1,805	95,91	1,882	0,17
POK	Saithe	0,007	0,357	98,08	0,364	0,03
ANF	Anglerfish	0,019	0,21	91,70	0,229	0,02
LIN	Ling	0,003	0,104	97,20	0,107	0,01
TOTAL		**447,623**	**678,304**	**N/A**	**1125,927**	**100**

(Source: STECF 2012 database)

Table 22 Landing and discard proportions for UoC2. Species in bold in green shaded cells represent the main bycatch species.

STECF 2012 data. Swedish grid. KATTEGAT SEA						
FAO code	Species	Landings (Tn)	Discards (Tn)	% Discards	Total catch	% Total catch
DAB	**Dab**	0,032	178,588	99,98	178,62	22,46
WHG	Whiting	0,124	35,233	99,65	35,357	4,45
FLX	Flounder	0,275	24,256	98,88	24,531	3,08
PLE	Plaice	1,018	19,273	94,98	20,291	2,55
LEM	Lemon sole	0,061	6,469	98,97	6,53	0,82

STECF 2012 data. Swedish grid. KATTEGAT SEA						
FAO code	Species	Landings (Tn)	Discards (Tn)	% Discards	Total catch	% Total catch
HKE	Hake	0,05	6,073	99,07	6,123	0,77
SOL	Sole	0,397	4,623	99,18	5,02	0,63
WIT	Witch	0,15	3,973	92,09	4,123	0,52
HER	Herring	0,043	0,405	96,36	0,448	0,06
CAT	Cat	0,3		90,40	0,3	0,04
TUR	Turbot	0,081	0,193		0,274	0,03
CRE	Edible crab	0,03		70,44	0,03	0,004
All bycatch species		**2,561**	**279,086**	**N/A**		**35,41**
TOTAL		**277,08**	**518,244**	**N/A**	**795,324**	**100**

(Source: STECF 2012 database)

3.4.2.2 Seltra gear

The Seltra gear under assessment in Units of Certification 3, 4, 7 and 8 is considered as a mixed fishery targeting Nephrops along with other species. Units of certification 3 and 4 consider Swedish vessels in the Skagerrak and in the Kattegat Sea respectively, while Units of Certification 7 and 8 correspond to Danish vessels also in the Skagerrak and in the Kattegat Sea.

The seltra gear has only been set out in Sweden since the beginning of 2013, both for the Skagerrak and Kattegat Seas. For this reason there are no data yet on catch composition. For the Skagerrak Sea the team has considered data from the previous Danish gear operating in the same waters, as a "precautionary proxy" for the current situation, as the range of species in the catch is expected to be similar to that caught in the seltra trawl. In the Kattegat Sea the Danish fleet has been operating with the seltra gear since July 2011, for this reason Danish data are taking for the assessment of these UoC.

There are no additional main bycatch species for these UoC as some proportion of species accounting for more than 5% of total catch are landed and therefore are considered under 'retained'. Tables 7 and 8 provide information of the discards proportion of all species in the seltra gear.

3.4.3 Endangered, Threatened or Protected Species (ETP)

According to MSC methodology, ETP species are defined as those that are recognised as such by national legislation and/or binding international agreement (e.g. CITES) to which the jurisdictions controlling the fishery under assessment are party. Species that appear exclusively on non-binding lists such as ASCOBANS, IUCN Red List, OSPAR, HELCOM or that are only the subject of intergovernmental recognition (such as FAO International Plans of Action) and that are not included under national legislation or binding international agreement are not considered as ETP under MSC protocols. Most capture fisheries have at least some potential to interact with Endangered, Threatened or protected species. The ETP interaction profile for each gear type varies and is greatly influenced by the manner in which it is utilised. Factors such as frequency of use, duration of deployment, season, and location, all play a role in defining a gear types ETP interaction profile.

The present certification includes three different gear types. Of these three, two (Swedish grid and seltra trawl) are considered to have varying degrees of potential to interact with ETP species. The potential for interaction of creel fisheries with ETP species in the Skagerrak & Kattegat Seas is considered to be negligible and at a scale that does not require a more focused management response.

In general, populations of endangered, threatened and protected (ETP) species are well studied in the Skagerrak and Kattegat Seas, with considerable levels of work undertaken in relation to the regular monitoring of fisheries interaction through the deployment of onboard scientific observers, capture of anecdotal information, focused national study/research programmes and a range of EU funded research programmes.

The team assessed species listed under the following legislation (Table 23):

» CITES Appendix II

» EC Regulation 43/2014 fixing for 2014 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, to Union vessels, in certain non-Union waters, and which prohibits landing of certain species (therefore protecting them)

Table 23 Protection of species and determinations of inclusion within ETP category

Species	CITES Appendix II	Council Regulation 43/2014
Cetorhinus maximus (Basking shark)	X	X
Carcharodon carcharias (White shark)		X
Dipturus batis (Common skate)		X
Lamna nasus (Portbeagle)		X
Manta birostris (Giant manta ray)		X
Phocoena phocoena (Harbour porpoise)	X	
Rhinobatidae (Guitarfishes)		X
*Squatina squatina (*Angel shark*)*		X

During the assessment of the Danish and Swedish Nephrops fishery, the assessment team have considered the above list of species in the context of the potential interactions with individual Units of Certification. The result of this analysis determined the Outcome Status score.

To score well, a fishery must be conducted in a manner that ensures ETP impacts fall within acceptable limits (as defined under legislation and / or binding agreements that are in place).

Direct information on interactions between species of special concern and the Swedish grid and seltra trawl in the Skagerrak and the Kattegat Seas has been occasionally sampled since 2005 by Swedish fishermen.

Swedish Finfo 2007:7 Action Plan for Endangered fish and shells (https://www.havochvatten.se/download/18.64f5b3211343cffddb2800018319/1348912834692/finfo2007_7.pdf) has been developed in accordance with the 2005 Swedish Red List of species which are considered as threatened and where fishing makes up a significant part of this threat.

Tables 24 and 25 list endangered species recorded by the Swedish grid fishery in the Skagerrak and Kattegat Sea in 2012 during sampling. Occasional sampling has also been carried out by SLU since 2005.

Table 24 ETP sampling in the Swedish grid fishery in the Skagerrak. 2012.

Species	Number of hauls sampled	Total number of fish in sampled hauls	Kg in the sampled hauls	Average number of individuals / haul	Average weight per haul (kg)	Number of hauls where the species occurred
Thorny skate	23	26	9,63	1,13	0,42	5
Thornback ray		3	1,68	0,13	0,07	1

Species	Number of hauls sampled	Total number of fish in sampled hauls	Kg in the sampled hauls	Average number of individuals / haul	Average weight per haul (kg)	Number of hauls where the species occurred
Spurdog		9	0,30	0,39	0,01	3

(Source: Swedish client)

Table 25 ETP sampling in the Swedish grid fishery in the Kattegat Sea. 2012.

Species	Number of hauls sampled	Total number of fish in sampled hauls	Kg in the sampled hauls	Average number of individuals / haul	Average weight per haul (kg)	Number of hauls where the species occurred
Thorny skate	20	7	4,78	0,35	0,24	2

(Source: Swedish client)

Table 26 and 27 lists the endangered species that have had interaction with the Danish seltra nephrops fishery in the Skagerrak and Kattegat Seas during 2011.

Table 26 Live weight (kilos) of species of special concern in the Danish seltra trawl fishery in the Skagerrak. 2011.

Species	SKAGERRAK	
	Individuals	Kg
Shark ssp	4	5
Coral	1	15
Allis shad (likely Twaite shad)	10	9,5
Spurdog	911	2000,25
Thorny skate	21	14
Ray ssp	17	31,25
Catshark	1	0
Unknown shark	2	2,5
Skate	1	2
Twaite shad	2	1
Tiger shark (very unlikely)	1	1,5
TOTAL	**971**	**2082**

(Source: Danish client)

Table 27 Live weight (kilos) of species of special concern in the Danish seltra trawl fishery in the Kattegat. 2011.

Species	KATTEGAT 2011	
	Individuals	Kg
Duck ssp	1	3
Oildrum	2	0
Giant oarfish	1	0
Coral	1	5
Harbour Porpoise	2	45
Spurdog	**305**	**536**

Species	KATTEGAT 2011	
	Individuals	Kg
Ray ssp	**780**	**1315,3**
TOTAL	**1092**	**1904,3**

(Source: Danish client)

As seen in client records, there are some unidentified records of sharks and skate. Even though numbers are not high, there is uncertainty in the actual catch of species listed under CR 43/2014. As seen during the site visit, there is some progress in this respect, as skippers pose now a specifically designed guide of ETP species in the area to improve their identification skills.

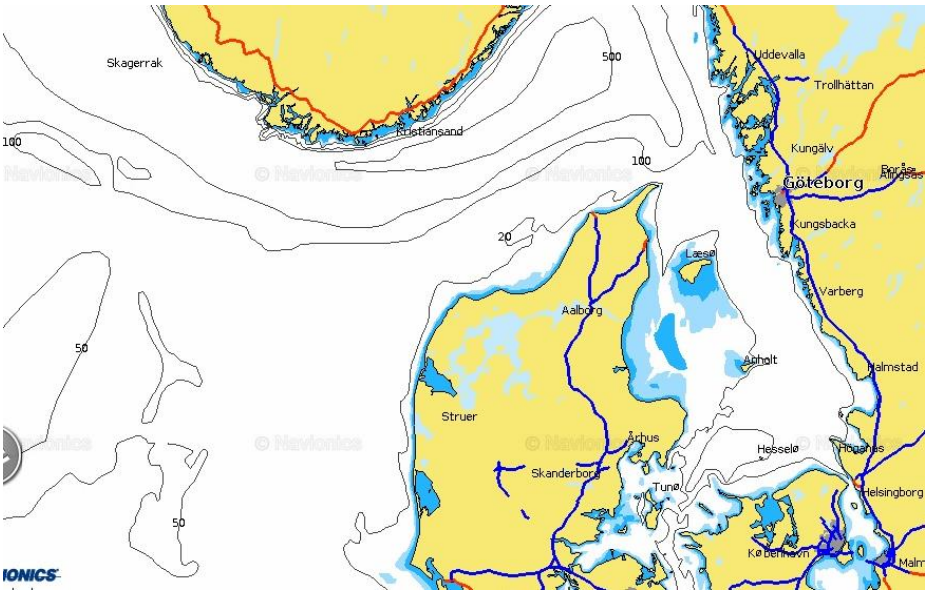
Common skate

The Danish fishery recorded 1315 kilos of different rays in the Kattegat Sea for 2012. Since 2013 Danish fishermen can check their identity in the DFPO ETP Identification Guide. Unfortunately, for 2012, rays annotation appears as miscellanea of ray species which may also include common skate. The presence of common skate in the catch is unlikely and expected to be listed as 'skate' rather than ray, but uncertainties over the accurate identification and reporting of skates and rays means that there is the potential for this grouping to include common skate.

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

As seen in Navionics bathymetries website application, the Kattegat Sea is a very swallow area with a mean depth of 50 m. proxy.

Figure 26 Bathymetric map of the Skagerrak and Kattegat Seas



(Source www.navionics.com)

There is a low probability of interactions between common skate and the fishery in the Kattegat Sea. The decline of the common skate in the North Sea has been described as the first clear case of a fish species brought to the brink of extinction by commercial fishing (Brander, 1981). 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, 2008). Common skate,

which were once commonly found in shallow waters of the European shelf, are now generally concentrated in waters of the shelf edge, outside of the main trawling areas, and in deeper waters of the Norwegian trench where the fishery does not take place to any significant degree.

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

Harbour porpoise

The harbor porpoise is listed in Annex II of the CITES listing. Moreover, is the flagship species in the "Agreement on the conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas" (ASCOBANS). A number of Natura 2000 sites are designated on account of significant use of the areas by Harbour porpoise. Denmark and Sweden are signatories to the ASCOBANS agreement, which was concluded in 1991 under the auspices of the Convention on Migratory Species (CMS or Bonn Convention) and entered into force in 1994. The agreement seeks to formalise and coordinate efforts to conserve the small cetacean species shared between member countries in the ASCOBANS Area, conscious that the management of threats to their existence, such as bycatch, habitat deterioration and other anthropogenic disturbance, requires concerted and coordinated responses, given that migrating cetaceans regularly cross national boundaries. A Conservation and Management Plan forming part of the Agreement obliges parties to engage in habitat conservation and management, surveys and research, pollution mitigation and public information. Other recent projects have focussed on mapping small cetacean in North East Atlantic waters (often focussing on the North Sea). A recent notable example has been the Small Cetaceans in the European Atlantic and North Seas project (SCANS & SCANS II).Today, the most significant threat for harbor porpoise in most areas is incidental catches in fishing gear, primarily gill nets. However, it is highly unlikely that marine mammals and cetaceans interact with trawling gears. Northridge (1988) provided several reasons why this species normally avoids the catch on demersal gears. According to the DTU Aqua Report Nº 250-2012, on the Danish sampling of commercial fishery (with special attention to discards. 2010 data), no interaction with harbor porpoise were recorded during the 250 hauls analysed. However, two harbour porpoises were caught by the seltra Danish gear in 2011 in the Kattegat Sea. An entanglement in the grid gear would be more difficult as bigger animals can escape through the escape window just before the grid panel.

Entanglement of harbour porpoise with creels may be possible, however it is advised by the Recovery Plan for Baltic Harbour Porpoise (ASCOBANS, 2009) that alternative gear to set nets be used and trialling of fish traps and traps is recommended on account of them being less harmful to porpoises.

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

3.4.4 Habitats

Skagerrak and Kattegat areas have been studied by different organisations, and their sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). NGO´s such as WWF, OCEANA and Greenpeace are also involved in the study of these areas.

The different Units of certification in the Danish and Swedish Nephrops assessment have been clearly separated according to their habitat, the Skagerrak and the Kattegat Seas. The main reason for this has been that there are different stocks of cod (which is an important retained species) in these areas. There are also some slight differences in catch composition for both areas. Units of Certification 1, 3, 5

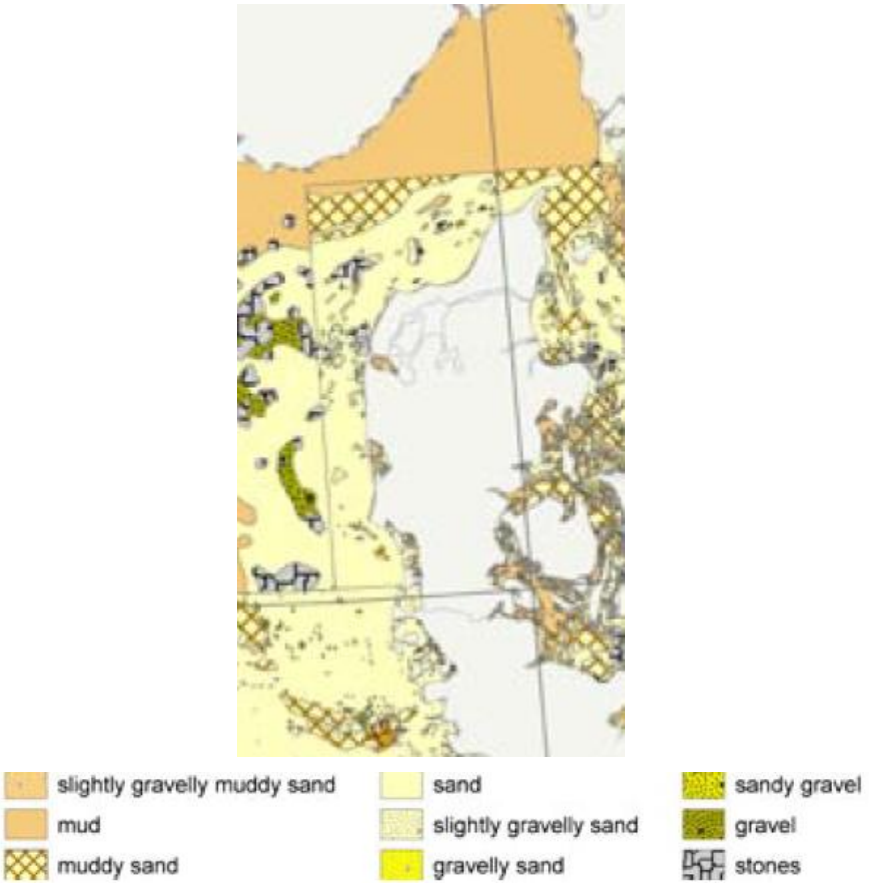
and 7 are situated in the Skagerrak Sea, while Units of certification 2, 4, 6 and 8 occur in the Kattegat Sea.

Both seas belong to the North Sea, Region II, Division IIIa, Due to the special characteristics of the Kattegat Sea, such as its low depth or salinity, some references to it can be found in Baltic Sea reports.

As seen in Figure 26 (bathymetric map) the Kattegat Sea is very swallow, with depths always smaller than 100 metres and a depth mean of less than 50 metres. Skagerrak Sea has deeper areas and some canyons that can reach 500 m depth.

Figure 27 (sediment map) shows abundance of muds in Skagerrak bottoms and muddy sands in the Kattegat ones. There are also some reported rocky areas reported by fishermen and marked on their plotters along the Swedish coast in the Skagerrak Sea.

Figure 27 Skagerrak and Kattegat aggregated sediment map

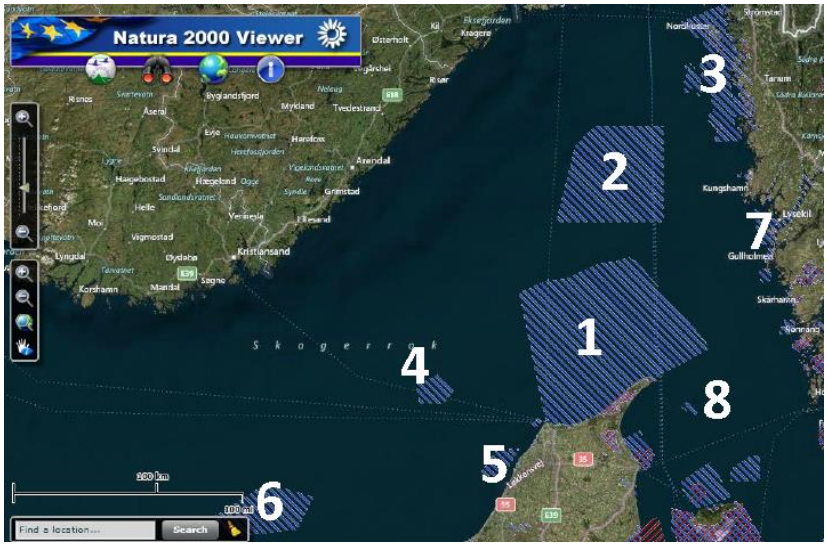


.

(Source: Digital Atlas of the North Sea)

There are several figures designated to protect habitats in the Skagerrak and Kattegat Seas. Figures 28 and 29 show main Natura2000 sites in the area. These areas have been designated to protect mainly birds, but also marine mammals or reefs.

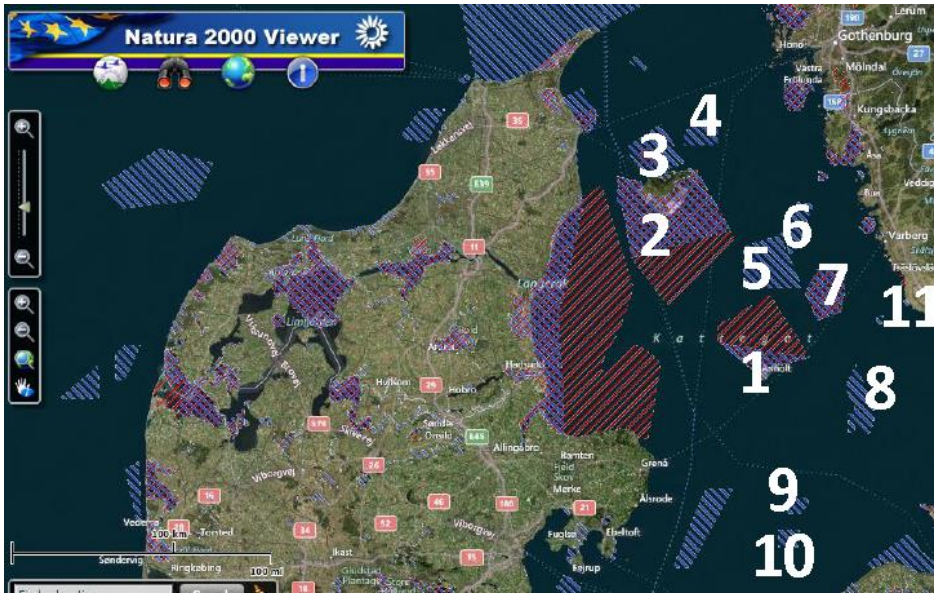
Figure 28 shows main Natura2000 sites in the Skagerrak Sea.



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

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

Figure 29 shows main Natura2000 sites in the Kattegat Sea



1: Anholt; 2: Stradenge pa laeso og havet syd herfor; 3: Havetomkring nordre runner; 4: Laesotrindel og tonneberg banke; 5: Kims top og den kinesiske mur; 6: Fladen; 7: Lilla middelgrund; 8: Stora middelgrund och rode bank; 9: Lysegrund; 10: Hesselo; 11: Morups bank

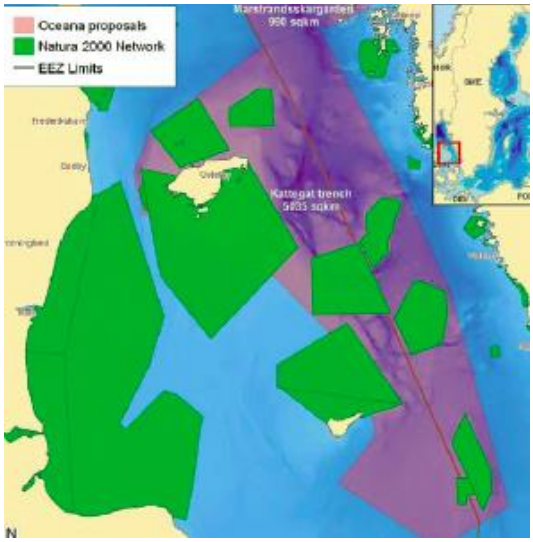
(Source: http://natura2000.eea.europa.eu/#)

Marine Protected Areas which are close to the shore (less than 4 n.m.) are protected from Swedish trawl vessels by the general trawl boundary, and the regulation to protect reefs inside this boundary, established at the Board of Fisheries Regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea. Danish vessels are not allowed within 3nm of the Swedish coast. Management measures in Natura2000 sites are now being developed following the designation process.

The coral reefs in the Skagens Gren area (Skagerrak) are protected since 2011 and there are current meetings about the future zoning boundaries to protect sensitive habitats for trawling. In 2009 the Kosterhavet National Park (Skagerrak) was the first Swedish marine national park to be established in the area.

OCEANA NGO has presented a proposal for a new marine protected area in the Kattegat trench, that would include marine protected areas 1 to 8 from Figure 29 under a single and bigger protected area.

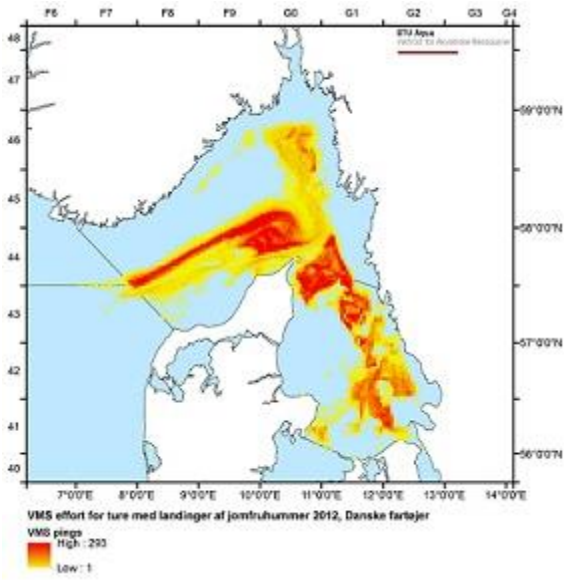
Figure 30 OCEANA´s proposal for a Marine Protected Area in the Kattegat.



(Source: http://baltic.oceana.org/sites/baltic.oceana.org/files/OCEANA_10_Kattegat_Trench.pdf)

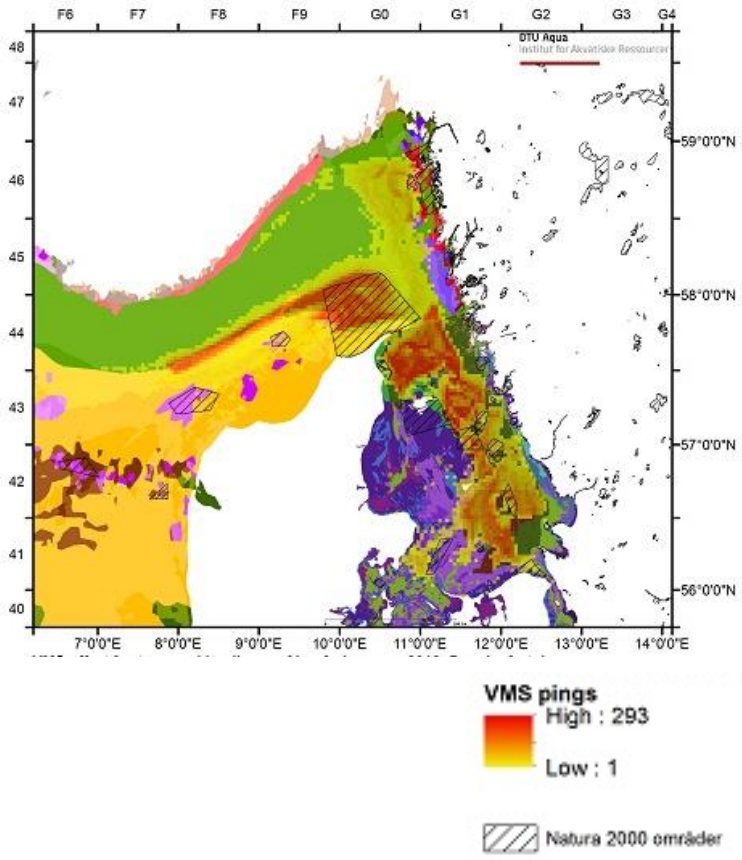
Figure 31 shows fishing effort for Danish trawling fleet in the Skagerrak and the Kattegat. As both Danish and Swedish vessels search for Nephrops grounds, it can be considered that they fish in the same places. Red colour shows higher trawling intensity, while yellow shows lower trawling intensity. Grated area in Figure 32 shows Natura2000 sites.

Figure 31 Fishing effort for Danish vessels in 2012.



(Source: Danish client)

Figure 32 Fishing effort for Danish vessels in 2012 and Marine Protected Areas in the area.



(Source: Danish client)

Maps of fishing effort of the creel fishery are not available, as vessels operating in the creel fishery do not normally carry VMS.

Impacts of pots and traps on benthic habitats were studied at the Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern United States (2001). Conclusions showed that these impacts were possible but rare. In muddy and sandy sediments, impacts to the biological structure could last from months to years, whilst impacts to the physical structure were shorter and lasted days or months

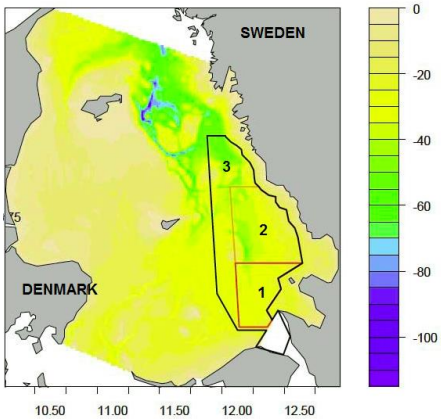
In 2009 three closed areas were introduced in the Kattegat Sea, where fishing is prohibited (seasonally or during the complete year) in order to protect fish stocks, especially cod that could benefit from area closures. These areas are regulated in the following way:

» The “red” permanently closed area (number 1) is closed for all fisheries, including recreational fisheries.

» The “orange” partially closed area (number 2) is closed for all fisheries in the period 1st January to 31st March. Fisheries with selective gears are allowed 1st April to 31st December.

» The “black” seasonally closed area (number 3) is closed during the period 1st January to 31st March, except for fishery with selective gears; The “black” area in the Northern Sound (”Kilen” or the Triangle) is closed 1st February to 31st March, except for fishery with selective gears.

Figure 33 Bathymetry of Kattegat and closed areas.



(Source: Evaluation of closed areas in Kattegat to promote the rebuilding of the cod stock).

Fishing in these areas is allowed for selective gears, such as the Swedish grid, the seltra gear and the creel fishery. (Article 11.2.b, Cod Recovery Plan: *The Council may, acting on a Commission proposal and on the basis of the information provided by Member States and the advice of STECF referred to in paragraph 3, exclude certain groups of vessels from the application of the effort regime provided that: the percentage of cod catches as assessed by STECF does not exceed 1.5 % of the total catches for each group of vessels concerned*). Therefore, seafloor impacts still occur inside areas 2 and 3.

Trawling 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 trawling 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 that 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 thereby 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) must also tow a clump weight or bottom roller along the seabed. Kaiser *et al* (2006) found that bottom trawl had a negative short-term effect (under 7 days) on sand and mud bottoms (Gislason, page 47. 2013). 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.

As seen on the VMS maps, for the Skagerrak Sea, a high proportion of the fishing occurs inside the Bratten, declared Natura2000 site to protect mammals. In the Kattegat Sea, fishing effort occurs in the proximity of the Stradenge pa laeso og havet syd herfor Nature 2000 site (Nr 2 in Figure 29) focused on the protection of birds and mammals, but not inside it.

Danish and Swedish Nephrops fishery also operates a partial strategy that seeks to minimize the impacts of the fishery on seabed habitats. Following on from Denmark's and Sweden´s commitment to operating within the terms of the Common Fisheries Policy, Article 2 of Council Regulation (EC) No 2371/2002 (31) provides that the Common Fisheries Policy 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) - this measure provides a clear 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, both Denmark and Sweden have created an ecologically coherent network of protected areas within which the most sensitive and /or vulnerable habitats and species are protected.

Moreover, the Danish NOVANA Programme (http://www2.dmu.dk/1_viden/2_publikationer/3_fagrapporter/rapporter/fr532.pdf) is responsible for monitoring the biological biodiversity and algae cover on the Natura 2000 reefs in the Skagerrak and Kattegat Seas.

Fishing intensity of the Swedish fisheries for *Nephrops*, cod and other benthic fish were studied in the Kattegat (area of study: 21.000 km2) for the period 2001-2003 (Gislason, page 62. 2013). Nilsson & Zieger (2007) found that more than 44% of the seabed was being fished. The study showed that 55% of hard bottom and 41% of mud bottom was trawled more than twice a year. The study did not include the Danish fishing, and the effects on bottom organisms were not investigated. Kaiser et al (2006) found that bottom trawl had a negative short-term effect (under 7 days) on bathing sand and mud bottom (Gislason, page 47. 2013).

3.4.5 Ecosystems

The fishery can impact the ecosystem in different ways, such as impacts of the use of the gear (studied under the habitat section), impacts of the removal of the target species (studied in the P1 background) but also of other retained and bycatch species, as well as the impacts of the removal of nephrops in the trophic relationships between the different species of the ecosystem. Benthic communities are also affected by the Nephrops fishery.

There is considerable knowledge of the habitats and ecosystem of the Skagerrak and Kattegat Seas, drawing on nearly one hundred years of regular 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, much of this research finds its way into 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. This is as a result of Europe having a clear 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, including Nephrops, within the North Sea food web. Many studies have been completed that examined the fish community structure in the North Sea.

These studies confirm that Nephrops is low trophic level species and are common prey for numerous marine species. There is a temporal coincidence in the decline of other species and Nephrops abundance, which suggests a relation between them. Nephrops main diet consists of crustaceans, molluscs, and to a lesser extent polychaetes and echinoderms (Parslow-Williams *et al*., 2002). Differences in diet appear to be due more to changes in prey abundance than to prey preference (Parslow-Williams *et al.*, 2002) indicating that the species is an opportunistic predator. *Nephrops* is preyed upon by different species such as cod, rays or dogfish.

ICES provides an annual overview of the state of the North Sea Ecosystem. ICES Mixed fisheries advice report for the North Sea (2013) (which includes Skagerrak, but not the Kattegat Sea) http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf, gives an overview of the stocks of different species and marks a path towards ecosystem management.

EU fisheries should address the precautionary and ecosystem approach in their management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help co-ordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE). Furthermore, legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations, such as the EU-Norway discard ban agreement for the Skagerrak Sea which was favorably voted by the European Parliament last April.

Measures in place, such as the closed areas, the cod recovery plan, the enforcement effort, the collaboration between the Swedish and Danish fisheries agencies, the establishment of Natura 2000 sites, the quota assigned, and the use of selective gears contribute to minimize impacts of the fishery.

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

Data continue to be collected through various organizations such as SLU, SwAM, DTU Aqua, Danish AgriFish Agency and different NGO´s, and will contribute to the detection of any change or increase in risk level to the main ecosystem components.

All fishing vessels that wish to participate in the MSC assessment have to sign a Code of Conduct which is recognized as a positive move as it 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, and procedures for dealing with hazardous waste. The CoC generally aims to increase awareness and encourage responsible behavior amongst fishermen, in order to minimize impacts of the fisheries on the wider ecosystem.

3.5 Principle Three: Management System Background

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.

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

3.5.1 Legislative framework

EU

Sweden is a Member State of the European Union, and its fisheries are therefore subject to the principles and practices of the Common Fisheries Policy (CFP) of the EU. Although there is national management (see below), the EU rules of the Common Fisheries Policy still apply to this Swedish fishery.

The first EU common measures in the fishing sector date from 1970, when it was agreed that, in principle, EU fishermen should have equal access to Member States' waters. However, in order to ensure that smaller vessels could continue to fish close to their home ports, a coastal band was reserved for local fishermen who have traditionally fished these areas – the Swedish fishery under assessment operates within these waters (out to 6 nautical miles) as well as further offshore in the Skagerrak and Kattegat.

The CFP was reviewed thoroughly in 2002 and the current basic fisheries regulation (No.2731/2002) was adopted by the Council of Ministers on 20th December 2002. The current policy is under review, and a revised policy is likely to be agreed in 2013. The scope of the CFP extends to conservation, management and exploitation of living aquatic resources and aquaculture, as well as processing and marketing of fishery products, covering related activities, both within EU waters and by any member state vessel or national – with due regard to the UN Convention on the Law of the Sea (UNCLOS) and without prejudice to the primary responsibility of the flag State.

Outside the CFP framework other EU legislation dealing with habitats and species protection is also relevant to fisheries management and to operators in the fishery.

National

Implementation of the CFP at a national level is carried out through the individual Member States. The Swedish Government has powers to take non-discriminatory fishery conservation measures within 12 miles.

Overall control of fisheries management and policy in Sweden falls under the Ministry of Rural Affairs (www.sweden.gov.se/sb/d/10352). Recent re-organisation means that the Swedish Board of Fisheries has now been replaced by The Swedish Agency for Marine and Water Management (SwAM) - a relatively new government authority, located in Gothenburg that works to achieve flourishing seas, lakes and streams. This includes fisheries administration such as licensing, application and enforcement of regulations, and control at point of landing (www.havochvatten.se). Responsibility for control and enforcement at sea, including inspection of gear, logbook and fishing areas remains with the Swedish Coast Guard (www.kustbevakningen.se).

The Institute of Marine Research is based in Lysekil on the Swedish west coast. The Institute was part of Swedish Board of Fisheries, but since the re-organization referred to above, this have fallen under the Swedish University of Agricultural Science (www.slu.se). The Institute is responsible for advising the authorities and ministries concerned by undertaking stock assessments, advising on sustainable exploitation rates and researching the wider impacts of fishing. Scientists from the Institute are actively engaged in the work of ICES and are significantly represented on the relevant ICES working groups.

Finally, the Swedish Board of Agriculture retains control of trade issues in relation to the fisheries sector, including administering the EU fisheries fund (www.jordbruksverket.se).

The main fisheries laws in Sweden are:

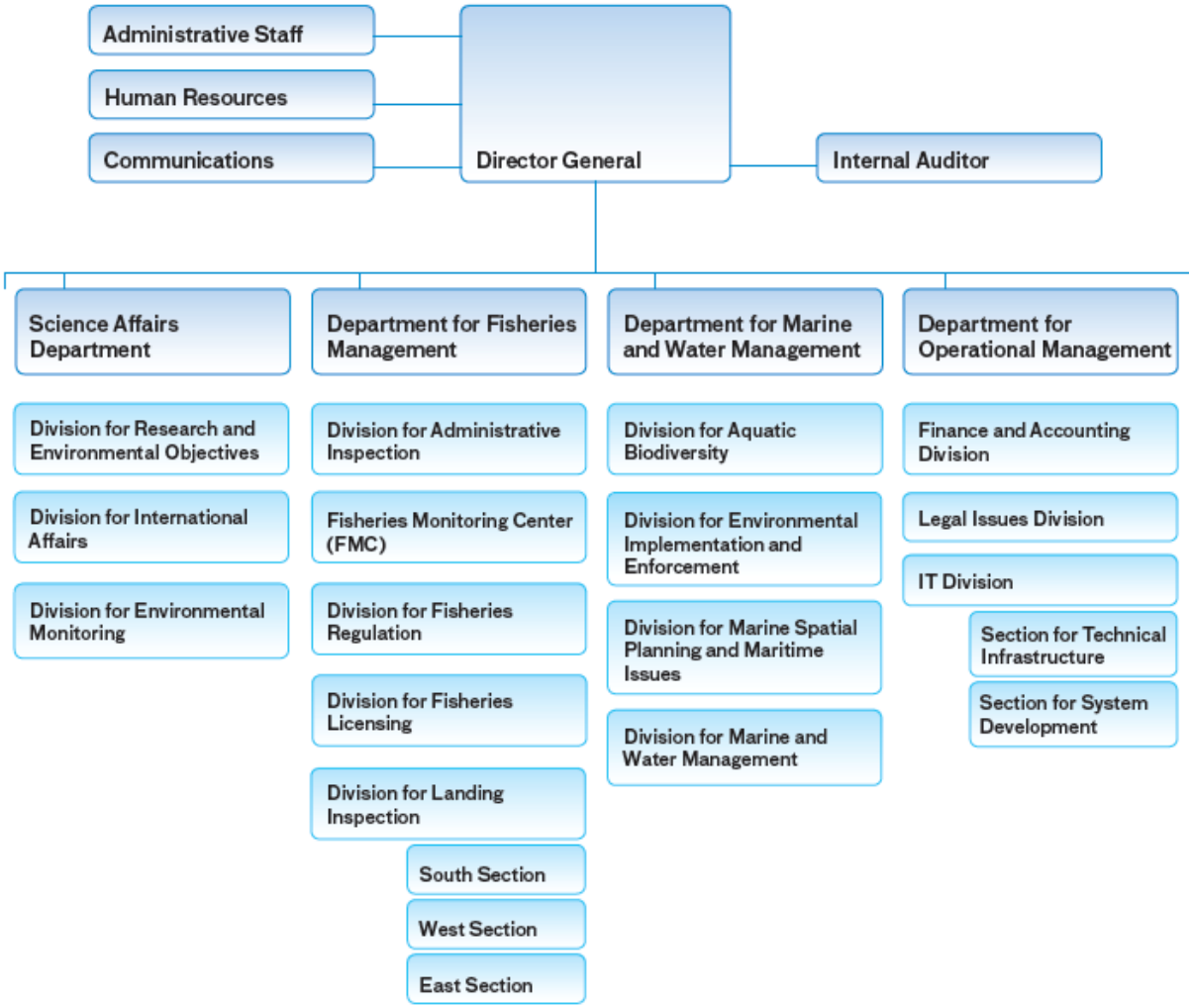
» The Fisheries law (Fiskelag) SFS 1993:787 on rights to fisheries, including fisheries within Sweden's sea territory and Sweden's economical zone, and

» The law concerning EC Regulations on the CFP (Lag om EG:s förordningar om dengemensamma fiskeripolitiken) SFS 1994:1709.

3.5.2 Consultation, Roles & Responsibilities

The Ministry for Rural Affairs has overall responsibility for Swedish fisheries and Swedish fishing vessels. This responsibility for fisheries management is devolved to the Swedish Marine and Water Authority (SwAM). An organizational chart is presented in the figure below and illustrates the integrated structure of fisheries management including science, management and enforcement, policy, planning and marine environmental responsibilities.

Figure 34 SwAM Organisational Structure



(Source: www.havochvatten.se)

The Department for Fisheries Management within SwAM describes its role as: responsible for coordinating the work around an integrated Swedish implementation of the EU Common fisheries Policy and, in particular, work toward a sustainable management of fisheries resources through an ecosystem-based approach.

The IIIa Nephrops stock is subject to scientific assessment by the International Council for the Exploration of the Seas (ICES), which provides Total Allowable Catch (TAC) advice to be determined by the Council of Ministers and enacted by the European Commission on an annual basis.

The primary body for fisheries science in Sweden is the Institute of Marine Research, which is based in Lysekil on the Swedish west coast. The Institute was part of Swedish Board of Fisheries, but since the re-organization referred to above, this have fallen under the Swedish University of Agricultural Science (www.slu.se). The Institute is responsible for advising the authorities and ministries concerned by undertaking stock assessments, advising on sustainable exploitation rates and researching the wider impacts of fishing. Scientists from the Institute are actively engaged in the work of ICES and are significantly represented on the relevant ICES working groups.

Finally, the Swedish Board of Agriculture retains control of trade issues in relation to the fisheries sector, including administering the EU fisheries fund (www.jordbruksverket.se).

There are a number of other entities involved with the Nephrops fishery, notably:

» Coastguard (control and enforcement)

» Fish Producer Organisations (management of quota, marketing and industry representation)

3.5.3 Objectives

Objectives for the sector are defined by a number of high-level strategic documents, including at EU level the CFP and the Marine Strategy Framework Directive (MSFD). The Directive requires Member States (MSs) to prepare national strategies to manage their seas to achieve or maintain Good Environmental Status (GES) by 2020.

At a national level, Sweden has long-term environmental objectives consistent with P2 principles and criteria under the Environmental Code:

1. human health and the environment are protected against damage and detriment, whether caused by pollutants or other impacts;
2. valuable natural and cultural environments are protected and preserved;
3. biological diversity is preserved;
4. the use of land, water and the physical environment in general is such as to secure a long term good management in ecological, social, cultural and economic terms; and
5. reuse and recycling, as well as other management of materials, raw materials and energy are encouraged with a view to establishing and maintaining natural cycles.

In 2012, the Swedish Parliament adopted 16 environmental quality objectives describing which states and qualities of the country's environment are sustainable in the long term. One of these is for a ‘Balanced Marine Environment, Flourishing Coastal Areas and Archipelagos’. This is explained further as "The North Sea and the Baltic Sea must have a sustainable productive capacity, and biological diversity must be preserved. Coasts and archipelagos must be characterized by a high degree of biological diversity and a wealth of recreational, natural and cultural assets. Industry, recreation and other utilization of the seas, coasts and archipelagos must be compatible with the promotion of sustainable development. Particularly valuable areas must be protected against encroachment and other disturbance."

SwAM is responsible for monitoring and delivering this objective, including via an adjustment of fisheries to sustainable levels. This is compatible with the long-term objectives established under the CFP.

3.5.4 Incentives

The European Fisheries Fund (2007-2013) is an EU fund with national match-funding that is made available to the Swedish fishing sector.

There are several incentives to encourage the adoption of more selective gear, by Nephrops fishers, including the exemption from effort (days at sea) restrictions under the cod recover plan and access to coastal waters. New gear regulations requiring selectivity devices are described below, which allow access of Nephrops trawlers to areas previously closed to them.

3.5.6 Fishery Specific Management System

Nephrops in area IIIa is assessed and managed under the CFP with TACs and regulations implemented by Member States. Member States are permitted to implement additional regulations within its own waters if these are more stringent than those set at an EU level.

In 2013 it was announced that Sweden and Denmark were to implement new gear regulations in the Skagerrak for their fleets targeting *Nephrops,* namely:

- Mandatory grid with 35 mm slot width.
- The mesh size of the cone part of the trawl and the extension piece shall be 70 mm square mesh.
- The total length of the cone and extension piece must be at least 8m.
- For mixed fishing using bottom trawls and purse seines:
- The basic rule is that the mesh size should be at least 120 mm diagonal mesh (diamond mesh). The mesh size applies to cone and extension piece however at least 8 meters.
- Exceptions (SELTRA TRAWL): 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 meters long and placed at 4 meters 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.

3.5.7 Compliance & Enforcement

The Fisheries Monitoring Centre (FMC) within SwAM is responsible for enforcing fisheries management and monitoring fishing activities (e-logbooks, VMS, registration of sellers. Starting 1 January 2013, it is obligatory for registered buyers in Sweden to report all sales notes electronically to the FMC.

3.5.8 Decision Making & Dispute Resolution

All EU member states have signed up to the CFP, and are bound by European legislation. Disputes between Member States and the Commission are resolved in the Council of Ministers. Where appropriate, European legislation is enacted at the national level through relevant primary and secondary legislation. Formal procedures apply for the resolution of disputes through the European Court of Justice and the national court systems. Extensive consultative processes are in place at national and European levels to debate policy, plans and management, and recent years have seen the introduction of more formal procedures to incorporate a wider stakeholder community within such consultations. Key institutions in this regard are the Advisory Committee on Fisheries and Aquaculture (ACFA) - which comprises a contact group at the European level for all stakeholders at national and regional levels – and the Regional Advisory Councils (RACs) – which comprise a contact group dealing with particular fisheries at the regional level. Within the fisheries administrative structures of the member state there are a wide range of bodies and committees through which problems can be raised and disputes debated and resolutions found. In Sweden the Ministerial Order on Impact Assessment of all Public Regulations (SFS 2007:1244) prescribes consultation with relevant stakeholder organisations and local authorities. Outside the machinery of government, there are a range of institutional solutions to dispute resolution – through the professional associations (at local, regional and national levels). The SFR decision-making and dispute resolution mechanisms are stated in the SFR by-laws ("Stadgar för SFR og normalstadgar för afdelingar") valid from 27 August 2010.

As this joint assessment, the first of its kind, shows, Sweden and Denmark will act bilaterally to develop and implement additional fisheries management in the Skagerrak and Kattegat. Another example is the action taken to implement cod recovery: after consultations with Scientists and various stakeholders and a thorough planning procedure, the ministers agreed on a no-fishing zone effective for both Swedish and Danish fishermen in January 2009 (closed areas shown in fig 32).

4. Evaluation Procedure

4.1 Harmonised Fishery Assessment

At the time of writing, no MSC assessments had already been completed that overlap with this assessment (detailed below) and findings presented in published assessment reports. In addition 1 MSC assessment overlapping this fishery is currently underway (as detailed below).

There are MSC assessments of whitefish species that include the Skagerrak and Kattegat sea areas.

These formed an important background resource for the assessment team - collating and reporting on available stock and fishery information, as well as highlighting areas of stakeholder and assessment team concerns.

Completed assessments

» None

Assessments in progress

» Skagerrak, Kattegat and Norwegian Deeps prawn:

http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-east-atlantic/skagerrak-kattegat-and-norwegian-deeps-prawn/Skagerrak-kattegat-and%20norwegian-deeps-prawn

In relation to the prawn (*Pandalus Borealis*) assessment, the assessment team carried out its site visit in Aug 2009, and found that there were concerns about stock status and associated management. At that time and subsequently the client has been working with scientists and regulators to improve understanding of this issue and to support the introduction of a stock recovery plan. This has resulted in a delay to the assessment. Therefore while technically in assessment, the assessment is not at a stage to enable harmonization.

4.1.1 Harmonisation Details

Harmonisation meeting/s

As there are no overlapping fisheries at a stage for harmonisation, a formal harmonisation meeting was not undertaken. However, the previous assessments that included area IIIa were reviewed and considered by the assessment team.

Meeting Outcomes

None

4.2 Previous assessments

There have been no previous assessments of the fishery.

4.3 Assessment Methodologies

This fishery was assessed using version 1.3 of the MSC Certification Requirements and version 1.3 of the MSC Full Assessment Reporting Template.

4.3.1 Assessment Tree

The Default Assessment Tree was used for this assessment with no adjustments.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits

In July 2013, 3 members of the assessment team, supported by an FCI staff member, undertook a site visit to Sweden and 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 notification of this site visit was issued on the MSC website and in 'Yrkesfiskaren' in order that all relevant stakeholders were aware of the opportunity to meet with the assessment team.

Itinerary of field activities

Tuesday 02.07.13			
Activity	**Name**	**Position**	**Organisation**
Swedish client meeting	Bengt Gunnarsson	Client Liaison	Client
Swedish stakeholder meeting	Mattias Skold	Scientist Head of Stock Assessment Unit	SLU Aqua Swedish University of Agricultural Science Turistgatan 5, 453 21 Lysekil, Sweden
Swedish stakeholder meeting	Mats Ulmestrand	Scientist	SLU Aqua Swedish University of Agricultural Science Turistgatan 5, 453 21 Lysekil, Sweden
Swedish stakeholder meeting	Susanne Eriksson	Associate Professor	Dept.of Biology & Environmental Science Gothenburg University Kristineberg
Vessels	Skippers	Ronnie Carlsson	Vessels, Gothenborg harbour
Wednesday 03.07.13			
Activity	**Name**	**Position**	**Organisation**
Travel to Copenhagen			
Danish Stakeholder Meeting	Ulla Wiborg	Head of Section Center for Control	Danish Agrifish Directorate
	Magnus Eckeskog	Policy advisor	Oceana
Thursday 04.07.13			
Activity	**Name**	**Position**	**Organisation**
Danish Stakeholder Meeting	Clara Ulrich	Senior Research Scientist	DTU
Danish stakeholder meeting	Mette Blaesberg Christop Mathiesen Inger Naslund	Conservation Officers Fisheries & Marine	WWF Denmark WWF Sweden
Fly to Aalborg			

Activity	Name	Position	Organisation
Danish stakeholder meeting	Jordan Feekings Niels Madsen	Scientists	DTU
Danish Client Meeting	Jonathan Jacobsen	Client Liaison	DFPO
Friday 05.07.13			
Activity	**Name**	**Position**	**Organisation**
Visit Vessels in Strandby	Claus Hjorne Pederson Kent Larson Alle Pedersen	Chair Strandby fishermen Assoc Skipper of K Larson Skipper of Charlotte	Vessels and Skippers
Return to Aalborg Airport			

4.4.2 Consultations

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:

Interview Programme

Name	Position	Organisation
Bengt Gunnarsson	Client Liaison	Client
Mattias Skold	Scientist Head of Stock Assessment Unit	SLU Aqua Swedish University of Agricultural Science Turistgatan 5, 453 21 Lysekil, Sweden
Mats Ulmestrand	Scientist	SLU Aqua Swedish University of Agricultural Science Turistgatan 5, 453 21 Lysekil, Sweden
Susanne Eriksson	Associate Professor	Dept.of Biology & Environmental Science Gothenburg University Kristineberg
Skippers		Vessels, Gothenborg harbour
Ulla Wiborg	Head of Section Center for Control	Danish Agrifish Directorate
Magnus Eckeskog	Policy advisor	Oceana

Name	Position	Organisation
Clara Ulrich	Senior Research Scientist	DTU
Mette Blaesberg Christop Mathiesen Inger Naslund	Conservation Officers Fisheries & Marine	WWF Denmark WWF Sweden
Jordan Feekings Niels Madsen	Scientists	DTU
Jonathan Jacobsen	Client Liaison	DFPO
Claus Hjørne Pedersen	Chairman, CEO, skippers	Strandby fishermen's Association

Source: FCI assessment team

Summary of Information Obtained

A substantial amount of information was provided to the assessment team by the client and by stakeholders. Scientists described the stock assessment process in detail along with the growing body of research on selectivity devices employed in the fishery. Management authorities indicated the fishery was closely managed and infringements were occasional and often related to logbook mistakes. WWF and Oceana raised concerns over the impact of trawling on the seabed, and of the status of cod in the Kattegat.

4.4.3 Evaluation Techniques

Public Consultation

A total of 19 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. This was felt to be the most appropriate media for this fishery and the processes used on the MSC website for tracking and announcing the various stages of the assessment as it progresses - from Full Announcement through to Certification - form an ideal tool through which to channel stakeholder interest and keep them abreast of the important stages of the assessment as a whole.

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.

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 is presented as **Appendix 1a** 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 1.1**).

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 Certification Requirements (Annex CB)

» 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 Danish and Swedish Nephrops Fisheries (Swedish) fishery are shown as **Appendix 1.1** 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. A score of 80 or above for all three Principles results in a pass.

5. Traceability

5.1 Eligibility Date

The **Target Eligibility Date** for this fishery will be 31 December, 2013. This means that any fish caught by the certified fleet following that date will be eligible to enter the chain of custody as certified product if and when certification is ultimately granted. The rationale for this date is that it meets with the client's wishes, for commercial reasons, for the date to be set at the earliest point at which the Certification Requirements allow.

The measures taken by the client to account for risks within the traceability of the fishery – and therefore generating confidence in the use of this date for target eligibility – are detailed in the rest of this section.

5.2 Traceability within the Fishery

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

- no transshipment;
- a geographically restricted fishery enabling concentrated inspection effort;
- accurate reporting – log books and sales notes (requirements of the Control Regulation 1224/2009 that are regularly inspected and cross-checked), including increasing use of electronic log books;
- verified landings data (including data on other retained species) are used for official monitoring of quota up-take and national statistics;
- a high level and sophisticated system of at sea monitoring, control and surveillance, in EU waters, including routine boarding and inspection, spotter planes, reporting to checkpoints when crossing international boundaries, VMS;
- close cooperation between EU regulatory and enforcement authorities and no immunity from prosecution in other jurisdictions;
- reporting prior to landing with limited tolerance – in event of high level of cod bycatches;
- a high level of inspection of landings prior to unloading. Officially calibrated weighing systems of landing. Routine inspection of entire factory process.

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

5.2.1 Description of Tracking, Tracing and Segregation Systems within the Fishery and Management systems in place relating to Traceability

Vessels over 12m are required to have a VMS system on board. A small number of trawlers below 12m operate in the fishery but these are highly likely to fish in the same areas as those tracked by VMS as Nephrops is targeted on specific grounds.

Catch is sorted on board and separated into boxes by species then weighed and recorded in the logbook on a daily basis. The log book reports gear used and fishing area, attributing a weight to each species per entry.

5.2.2 Evaluation of Risk of Vessels Fishing Outside of UoC

There is a small risk of vessels fishing outside the UoC as this is specific to both sea area (Skagerrak or Kattegat) and gear type. There is the potential for vessels to cross from Skagerrak into Kattegat and vice- versa on a single trip. However vessels must specify the sea area and the specific gear used per trip in the logbook. Vessels are only permitted to fish with one type of gear per trip. Logbooks are reported via the elogbook system and verified by regular at sea and in port inspections.

Vessels fishing with creel are unlikely to fish with any other gear types or fish in more than one sea area and therefore the risk is negligible for UoCs 5 and 6.

5.2.3 Risk of Substitution of Mixing Certified / Non-Certified Catch prior to point of landing

All Nephrops caught by the gears specified and areas specified in the UoCs are under assessment. Vessels must specify in their logbook what gear is used and which area they are fishing in on a trip-by-trip basis. There is therefore no risk of mixing certified and non-certified catch prior to landing.

5.2.4 At-Sea Processing

At sea processing is limited to the gutting of fish and the tailing of Nephrops. Conversion factors are applied to each to determine live weight equivalents that are then applied to quota.

5.2.5 Trans-Shipment

There is no transhipment of product from the fishery at sea – all product is landed.

5.2.6 Robustness of management systems relating to traceability

There is a high level and sophisticated system of at sea monitoring, control and surveillance, including routine boarding and inspection, spotter planes, reporting requirements and the use VMS. These systems are cross-referenced to corroborate reporting and this ensures a robust management system.

5.3 Eligibility to Enter Further Chains of Custody

Only *Nephrops norvegicus* caught in the manner defined in the Unit of Certification (**Section 3.1**) under restrictions detailed throughout the body of the final Public Certification Report for this fishery shall be eligible to enter the Chain of Custody. Chain of Custody should commence following the first point of landing, at which point the product shall be eligible to carry the MSC logo (under restrictions imposed by the MSC Chain of Custody standard). There are no restrictions on the fully certified product entering further chains of custody. The Fiskeri AB Ginneton/Gothenberg Fish Auction does not require its own chain of custody certificate.

5.3.1 Eligible points of landing

Eligible points of landing include all designated Swedish and Danish ports.

Landings by the Swedish creel fishery will also occur at smaller landing points around the Swedish coast.

5.3.2 Parties eligible to use the fishery certificate

All Danish and Swedish vessels listed as fishing under the Fiskeri AB Ginneton certificate are eligible to use the certificate.

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

There are no IPI stocks in this fishery.

6. Evaluation Results

6.1 Principle Level Scores

Final Principle Scores

Principle	UoC1	UoC2	UoC3	UoC4	UoC5	UoC6
Principle 1 - Target species	82.5	82.5	82.5	82.5	82.5	82.5
Principle 2 - Ecosystem	85.7	86.3	82.3	83.0	90.0	91.3
Principle 3 - Management	89.8	89.8	89.8	89.8	89.8	89.8

Source: FCI assessment team

6.2 Summary of Scores

Prin-ciple	PI No.	Performance Indicator (PI)	Score					
			UoC1	UoC2	UoC3	UoC4	UoC5	UoC6
One	1.1.1	Stock status	90	90	90	90	90	90
	1.1.2	Reference points	75	75	75	75	75	75
	1.1.3	Stock rebuilding	N/A	N/A	N/A	N/A	N/A	N/A
	1.2.1	Harvest strategy	85	85	85	85	85	85
	1.2.2	Harvest control rules & tools	65	65	65	65	65	65
	1.2.3	Information & monitoring	90	90	90	90	90	90
	1.2.4	Assessment of stock status	90	90	90	90	90	90
Two	2.1.1	Outcome	90	90	80	80	80	90
	2.1.2	Management	95	95	80	80	95	95
	2.1.3	Information	95	95	80	80	90	90
	2.2.1	Outcome	80	80	80	80	80	80
	2.2.2	Management	90	90	80	80	95	95
	2.2.3	Information	85	85	85	85	80	80
	2.3.1	Outcome	80	80	80	80	95	95
	2.3.2	Management	90	90	90	90	90	90
	2.3.3	Information	80	80	80	80	85	85
	2.4.1	Outcome	80	80	80	80	100	100
	2.4.2	Management	75	75	75	75	85	85
	2.4.3	Information	85	95	85	95	85	95
	2.5.1	Outcome	80	80	80	80	100	100
	2.5.2	Management	80	85	80	85	90	95
	2.5.3	Information	100	95	100	95	100	95
Three	3.1.1	Legal & customary framework	95	95	95	95	95	95
	3.1.2	Consultation, roles & responsibilities	85	85	85	85	85	85
	3.1.3	Long term objectives	100	100	100	100	100	100
	3.1.4	Incentives for sustainable fishing	90	90	90	90	90	90
	3.2.1	Fishery specific objectives	90	90	90	90	90	90
	3.2.2	Decision making processes	80	80	80	80	80	80
	3.2.3	Compliance & enforcement	85	85	85	85	85	85
	3.2.4	Research plan	90	90	90	90	90	90
	3.2.5	Management performance evaluation	90	90	90	90	90	90

Source: FCI assessment team

6.3 Summary of Conditions

Summary of conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/ N/A)
1 (all UoC)	A limit reference point for the Nephrops fishery in Division IIIa should be formally defined.	1.1.2	n/a
2 (all UoC)	Well defined harvest control rules taking into account the main uncertainties should be in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	1.2.2	n/a
3 (UoC 1,2,3 &4)	By the 4th annual surveillance the client shall demonstrate the implementation of a full, detailed and explicit 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). Demonstrate due regard to Natura 2000 sites and capture Natura 2000 management requirements in the fishery spatial plan.	2.4.2	n/a

Source: FCI assessment team

6.3.1 Recommendations

The assessment team has made the following recommendation associated with this fishery:

Recommendation 1:

The team considers that the selectivity of the fishing gears should be improved in order to reduce the high discard ratios, paying special attention to flatfish.

6.4 Determination, Formal Conclusion and Agreement

All UoCs in the fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any MSC Criteria:

UoC 1: Trawl in the Skagerrak using the Swedish Grid

UoC 2: Trawl in the Kattegat using the Swedish Grid

UoC 3: Trawl in the Skagerrak using the seltra gear

UoC 4: Trawl in the Kattegat using the seltra gear

UoC 5: Creel in Skagerrak

UoC 6: Creel in the Kattegat

It is therefore determined that these UoCs in the **Danish and Swedish Nephrops Fisheries (Swedish) fishery should be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries**.

Following this decision by the assessment team, and review by stakeholders and peer-reviewers, the determination will be presented to FCI's decision-making entity that this fishery has passed its assessment and should be certified.

7. References

» Addison, J. T., and Bell, M. C. 2000. Report of a workshop held at Cefas, Lowestoft to consider the use of estimates of Nephrops abundance derived from burrow counts. In Report of the Study Group on Life History of Nephrops, pp. 104–111. ICES Document CM 2000/G: 06 Ref. ACFM.

» Annual report for the Swedish National Programme for collection of fisheries data 2012. Swedish Agency for Marine and Water Management. https://www.havochvatten.se/download/18.2a9b232013c3e8ee03e7a3f/1364904967368/Sweden_NP_Proposal_2011-2013_Text_26-Mar-2013.pdf

» Arkley K (1990) Fishing trials to evaluate the use of square mesh selector panels fitted to Nephrops trawls— MFVHeather Sprig (BCK 181) November/December 1990, SFIA, Seafish Report, 383

» ASCOBANS (2004). Annual national reports submitted to the Secretariat as of 27 April 2004 (Belgium, Germany, Sweden, and UK). Document AC11/Doc. 30(S) presented at the 11th Advisory Committee meeting to ASCOBANS, Jastrzebia Góra, Poland, 27 – 29 April, 2004. http://www.ascobans.org/pdf/ac11/ac11-30.pdf

» Bagge, O.; Nielsen, E.; Mellergaard, S.; Dalsgaard, I., 1990: Hypoxia and the demersal fish stock in the Kattegat (IIIa) and Subdivision 22. ICES C.M. E: 4, 52 pp.

» Bell, M., Redant, F., Tuck, I., 2006. Nephrops species. In: Phillips, B. (Ed.), Lobsters: Biology, Management, Aquaculture and Fisheries, Blackwell Publishing, Oxford Chapter 13.

» Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic populations caused by trawl fisheries on the Dutch continental shelf in the North Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331. http://icesjms.oxfordjournals.org/content/57/5/1321.abstract

» Björnsson, B. and Dongala Dombaxeb, M.A. ICES Journal of Marine Science. (2004) 61 (6):983-991. Quality of Nephrops as food for Atlantic cod (*Gadus morhua* L.) with possible implications for fisheries management. http://icesjms.oxfordjournals.org/content/61/6/983.abstract

» Board of Fisheries regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea https://www.havochvatten.se/miljopolitik-och-lagar/lagstiftning/svensk-lagstiftning/havs--och-vattenmyndighetens-forfattningssamling/register/fiskeriverkets-foreskrifter-fifs-200436-om-fiske-i-skagerrak-kattegatt-och-ostersjon.html

» Campbell, N., Dobby, H., and Bailey, N. 2009. Investigating and mitigating uncertainties in the assessment of Scottish *Nephrops norvegicus* populations using simulated underwater television data. ICES Journal of Marine Science 66: 646–655.

» Catchpole, T.L., and Revill, A.S. Gear Technology in Nephrops trawl fisheries. Rev. Fish Biol. Fisheries. Doi: 10.1007/s11160-007-9061-y

» Chapman, C.J 1980 Ecology of juvenile and adult *Nephrops* in the biology and management of lobsters, Vol. 1 (edited by JS Cobb and BF Phillips), pp. 143-148 New York: Academic Press.

» Chapman, C. J., and Howard, F. G. 1979. Field observations on the emergence rhythm of the Norway lobster *Nephrops norvegicus*, using different methods. Marine Biology, 51: 157–165.

» Chapman, C. J., and Rice, A. L. 1971. Some direct observations on the ecology and behaviour of the Norway lobster *Nephrops norvegicus*. Marine Biology, 10: 321–329.

» CITES: Convention on International Trade in Endangered Species of wild fauna and flora. http://www.cites.org/sites/default/files/eng/app/2013/E-Appendices-2013-06-12.pdf

» COUNCIL REGULATION (EU) No 43/2014 fixing for 2014 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, to Union vessels, in certain non-Union waters. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2014:024:0001:0145:EN:PDF

» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF

» Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. http://icesjms.oxfordjournals.org/content/60/2/371.full

» Eno, N. C., D. S. MacDonald, J. A. M. Kinnear, S. C. Amos, C. J. Chapman, R. A. Clark, F. St. P. D Bunker and C. Munro. 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58: 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.full.pdf+html

» Enever, R., Catchpole, T.L, Ellis, J.R. and Grant, A. 2009. The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research, Volume 97,

» Issues 1-2, April 2009, Pages 72-76 http://www.sciencedirect.com/science/article/pii/S0165783609000046

» Enever, R. Revill, A. Caslake, R. and Grant, A. 2010. Discard mitigation increases skate survival in the Bristol Channel. Fisheries Research, Volume 102, Issues 1-2, February 2010, Pages 9-15. http://www.sciencedirect.com/science/article/pii/S0165783609002598

» EU – Norway Long Term Management Plan for haddock. http://www.nwwrac.org/admin/publication/upload/LTMP_North_Sea_Haddock_MSE_CN_EN.pdf

» EU – Norway Long Term Management Plan for saithe. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:DKEY=728986:EN:NOT

» Feekings J, Bartolino V, Madsen N, Catchpole T (2012) Fishery Discards: Factors Affecting Their Variability within a Demersal Trawl Fishery. PLoS ONE 7(4): e36409. doi:10.1371/journal.pone.0036409. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0036409

» Fiskeriverket. Measures to allow more accurate estimates of fisheries bycatch and their effect on endangered species and stocks. 2007-06-29

» Fiskeriverter informerar. F-info 2011:6 Fish and benthic environment at the Swedish west coast, 2004-2009: Effects of jet boundary relocation and other fishing regulations. https://www.havochvatten.se/download/18.64f5b3211343cffddb2800012608/1348912838177/finfo2011_6.pdf

» Fordham S , Fowler SL , Coelho R , Goldman KJ , Francis M. 2006 . *Squalus acanthias*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.2. Available from: http://www.iucnredlist.org

» Gislason, H. et al. 2013. Miljøskånsomhed og økologisk bæredygtighed i dansk fiskeri. DTU 2013. Journal nr 12/09478 (Sustainability and ecology of Danish fisheries) http://levendehav.dk/wp-content/uploads/Milj%C3%B8sk%C3%A5nsomhed-og-b%C3%A6redygtighed-i-dansk-fiskeri-3.pdf

» Gordon, J.D.M. and de Silva, S.S. (1980). The fish populations of the West of Scotland Shelf. Part I, Oceanographic Marine Biology Annual Review, 18, 317-366

» Hill, A. E. 1990. Pelagic dispersal of Norway lobster *Nephrops norvegicus* larvae examined using an advection-diffusion-mortality model. Marine Ecology Progress Series, 64: 217-226.

» Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235

» Holthuis, L.B. 1980. FAO Species Catalogue. Vol. 1 Shrimps and prawns of the world. An annotated catalogue of species of interest to fisheries. FAO Fish. Synop. (125) Vol. 1: 271pp.

» Hornborg, S. et al. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated using a life cycle approach. Marine Policy (2012) Figure 4, Page 5. http://www.sciencedirect.com/science/article/pii/S0308597X12000346

» Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication.

» http://www.fishonline.org/fish/dab-96

» http://www.marlin.ac.uk/biotic/browse.php?sp=4390

» http://natura2000.eea.europa.eu/#

» http://www.naturstyrelsen.dk/Naturbeskyttelse/Natura2000/Natura_2000_planer/Se_Planerne/001_125/

» http://www.nsrac.org/wp-content/uploads/2012/06/ICES-advice-2012_July10_NSRAC.pdf

» http://projektwebbar.lansstyrelsen.se/kosterhavet/Sv/Pages/default.aspx

» http://stecf.jrc.ec.europa.eu/documents/43805/595663/Evaluation+od+Cod+Avoidance+measures+for+Kattegat_cod_evaluation.pdf

» Humborstad, O.-B., Nøttestad, L., Løkkeborg, S., and Rapp, H. T. 2004. RoxAnn bottom classification system, sidescan sonar and video-sledge: spatial resolution and their use in assessing trawling impacts. ICES Journal of Marine Science 61, 53-63. http://icesjms.oxfordjournals.org/content/61/1/53.full.pdf

» ICES. 2002. Report of the Working Group on Ecosystem Effects of Fisheries. Advisory Committee on Ecosystems

» ICES 2007. Report of the Workshop on the use of UWTV surveys for determining abundance in *Nephrops* stocks throughout European waters (WKNEPHTV). ICES CM: 2007/ACFM: 14

» ICES 2008. Report of the Workshop and training course on *Nephrops* burrow identification (WKNEPHBID). ICES CM: 2008/LRC: 3 Ref: LRC, ACOM.

» ICES 2009a. Report of the Benchmark Workshop on *Nephrops* assessment (WKNEPH). ICES CM: 2009/ACOM: 33.

» ICES 2009b. Report of the Study Group on *Nephrops* Surveys (SGNEPS). ICES CM 2009/LRC: 15.

» ICES CM 2009 ACOM Advisory Committee: 20 Report of the Working Group on the Assessment on Ecosystem Effects of Fishing Activities. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WGECO/wgeco_final_2009.pdf

» ICES WGMHM REPORT 2009: Report of the Working Group on Marine Habitat Mapping. http://www.aquabiota.se/publikationersveng/pdf/wgmhm09.pdf

» ICES, 2010a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 5 - 11 May 2010 ICES Headquarters, Copenhagen. ICES CM 2010/ACOM: 13.

» ICES 2010b. Report of the Study Group on *Nephrops* Surveys (SGNEPS). ICES CM 2010/SSGESST: 22. Ref: SCICOM, ACOM

» ICES (2010) Report of the study group on Bycatch of Protected Species (SGBYC).ICES ADVISORY COMMITTEE. ICES CM 2010/ACOM:25 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/SGBYC/sgbyc_final_2010.pdf

» ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13.

» ICES. 2012b. Report of the Study Group on *Nephrops* Surveys (SGNEPS), 6–8 March 2012, Acona, Italy. ICES CM 2012/SSGESST: 19. 36 pp.

» ICES 2013 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf

» ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf

» ICES 2013 Advice for dab. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/dab-nsea.pdf

» ICES June 2013. Advice for mixed fisheries in Division IIIa North (Skagerrak). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf

» ICES 2013 Advice for haddock. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/had-34.pdf

» ICES 2013 advice for herring in Division IIIa and Subdivisions 22-24. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf

» ICES 2013 Advice for plaice. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf

» ICES May 2013. Advice for plaice in Subdivisions 21-23. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-2123_201304142222.pdf

» ICES 2013 Advice for saithe. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/sai-3a46.pdf

» ICES 2013 Advice for witch. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/wit-nsea.pdf

» ICES 2013 WG NEW. Summary evaluation of closed areas in Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGNEW/WGNEW%20report%20160513.pdf

» Jacobsen, J.B. (DFPO), 2013. Styrehus guide beskyttede arter I fiskeriet. (Guide for recognizing ETP species in the area).

» 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf

» Jennings S, Nicholson MD, Dinmore TA, Lancaster JE (2002) Effects of chronic trawling disturbance on the production of infaunal communities. Mar Ecol Prog Ser 243:251–260 http://www.int-res.com/articles/meps2002/243/m243p251.pdf

» Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. http://icesjms.oxfordjournals.org/content/55/3/353.full.pdf

» M. J. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. http://www.int-res.com/articles/feature/m311p001.pdf

» Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print

» Lars-Ove, L., S. Baden & M. Ulmestrand, 1993. Suspension feeding in adult *Nephrops* norvegicus (L.) and Homarus gammarus (L.) (Decapoda). Netherlands Journal of Sea Research. 31:3, 1-6.

» Løkkeborg, S. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO Fisheries technical paper 472. 2005 http://www.fao.org/docrep/008/y7135e/y7135e00.htm

» Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp. http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf

» Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf

» Maltagliati, F., Camilli, L., Biagi, F., and Abbiati, M. 1998. Genetic structure of Norway lobster, *Nephrops norvegicus* (L.) (Crustacea: Nephropidae), from the Mediterranean Sea. Scientia Marina, 62: 91-99.

» Mandelman, J.W., and M.A. Farrington. 2007a. The estimated short-term discard mortality of a trawled elasmobranch, the spiny dogfish (*Squalus acanthias*). Fisheries Research 83 (2007) 238–245. http://www.sefsc.noaa.gov/sedar/download/S21_RD16_Mandelman%26Farrington2007.pdf?id=DOCUMENT

» Morello, E. B., Froglia, C., and Atkinson, R. J. A. 2007. Underwater television as a fishery-independent method for stock assessment of Norway lobster (*Nephrops norvegicus*) in the central Adriatic Sea (Italy). ICES Journal of Marine Science, 64: 1116–1123.

» NEFSC. Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern United States, 2001. Northeast Fisheries Science Center Reference Document 02-01. http://nefsc.noaa.gov/publications/crd/crd0201/crd0201.pdf

» Northridge, S. An updated world review of interactions between marine mammals and fisheries. FAO fisheries technical paper, 251. http://www.fao.org/docrep/003/t0452e/t0452e00.htm

» NOVANA Programme (National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment). http://www2.dmu.dk/1_viden/2_publikationer/3_fagrapporter/rapporter/fr532.pdf

» Nøstvik, F and Pedersen, T. 1999. Catching cod for tagging experiments. Fish. Res. 42: 57-66. http://www.sciencedirect.com/science/article/pii/S0165783699000375

» Oceana, 2011. Fisheries management in the Baltic Sea. How to get on a track to a sustainable future in Baltic fisheries. http://oceana.org/en/eu/media-reports/publications/fisheries-management-in-the-baltic-sea-how-to-get-on-track-to-a-sustainable-future-in-baltic-fishe

» OCEANA. Conservation proposals for ecologically important areas in the Baltic Sea. 2011. http://oceana.org/en/eu/media-reports/publications/baltic-conservation-proposals-for-ecologically-important-areas-in-the-baltic-sea

» Oceana, 2013. Oceana proposal for a Marine Protected Area: Kattegat trench (Baltic Sea Project). http://oceana.org/sites/default/files/euo/OCEANA_10_Kattegat_Trench.pdf

» ORCA-EU, The Fisheries Secretariat (FiSH) (2007). A report on IUU fishing of Baltic Sea. http://www.fishsec.org/downloads/1198235739_21059.pdf

» OSPAR 2010. Background Document for Common skate *Dipturus batis*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf

» OSPAR Commission 2010. Background Document for Spurdog or Spiny dogfish Squalus acanthias. http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf

» Pampoulie, C., Skirnisdottir, S., Hauksdottir, S., Olafsson, K., Eiriksson, H., Chosson, V., Hreggvidsson, G. O., Gunnarsson, G. H., and Hjorleifsdottir, S. 2011. A pilot genetic study reveals the absence of spatial genetic structure in Norway lobster (*Nephrops norvegicus*) on fishing grounds in Icelandic waters. – ICES Journal of Marine Science, 68: 20–25.

» Parslow-Williams, P., Goodheir, C., Atkinson, R.J.A. & Taylor, A.C., 2002. Feeding energetics of the Norway lobster, *Nephrops norvegicus* in the Firth of Clyde, Scotland. *Ophelia*, **56**, 101-120. http://cel.webofknowledge.com/InboundService.do?SID=U2IdkSsNrYtswp8HOi8&product=CE

L&UT=000178458400004&SrcApp=Highwire&Init=Yes&action=retrieve&Func=Frame&customersID=Highwire&SrcAuth=Highwire&IsProductCode=Yes&mode=FullRecord

» Pommer, C.D., "Does bottom trawling fishery have an impact on the benthis fauna in the Kattegat?" http://researchonline.jcu.edu.au/21463/3/21463_Stieglitz_and_Ridd_2011.pdf

» 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. http://www.sciencedirect.com/science/article/pii/S0165783604001870

» Robertson J, Shanks AM (1997) Experiments with rigid grids in the Nephrops and whitefish fisheries, Marine Labora- tory, Aberdeen Report, 4/97

» 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. http://www.researchgate.net/publication/232978854_Spiny_Dogfish_Mortality_Induced_by_Gill-Net_and_Trawl_Capture_and_Tag_and_Release

» Stamatis, C., Triantafyllidis, A., Moutou, K. A., and Mamuris, Z. 2004. Mitochondrial DNA variation in Northeast Atlantic and Mediterranean populations of Norway lobster, *Nephrops norvegicus*. Molecular Ecology, 13: 1377–1390.

» Stamatis, C., Triantafyllidis, A., Moutou, K. A., and Mamuris, Z. 2006. Allozymic variation in Northeast Atlantic and Mediterranean populations of Norway lobster, Nephrops norvegicus. ICES Journal of Marine Science, 63: 875-882.

» SwAMN. Evaluation of closed areas in Kattegat to promote the rebuilding of the cod stock. https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf

» Swedish Government commission L2013/1017/JFS. Government Commission on Monitoring ban discards in Skagerrak. Regeringsuppdrag om kontroll av förbud mot utkast av fisk i Skagerrak. 31/05/2013. https://www.havochvatten.se/download/18.3f5692b613e6622a2eb135a/1369980528925/Regeringsuppdrag+om+kontroll+av+utkastf%C3%B6rbud+i+Skagerrak+L2013_1017_JFS.pdf

» 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. http://www.int-res.com/abstracts/meps/v298/p79-94/

» Tuck, I.D., Chapman, C.J. & Atkinson, R.J.A., 1997. Population biology of the Norway lobster, *Nephrops norvegicus* (L.) in the Firth of Clyde, Scotland. I. Growth and density. *ICES Journal of Marine Science*, **54**, 125-135.

» Ulmestrand, M., and Eggert, H. 2001. Growth of Norway lobster, *Nephrops norvegicus* (Linnaeus 1758), in the Skagerrak, estimated from tagging experiments and length frequency data. ICES Journal of Marine Science, 58: 1326-1334.

» Vinther, M., Eero M. (2013). Quantifying relative fishing impact on fish population based on sp atio-temporal overlap of fishing effort and stock density. ICES journal of Marine Science 2013. http://icesjms.oxfordjournals.org/content/early/2013/01/22/icesjms.fst001.short

» Wileman, D.A., G. I. Sangster, M. Breen, M. Ulmestrand, A. V. Soldal and R.R. Harris, 1999. Roundfish and *Nephrops* survival after escape from commercial fishing gear. EC Contract No: FAIR-CT95-0753. Final Report 1999. 125 p + appendix, e

» WG NEW (2013). http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGNEW/WGNEW%20report%20160513.pdf

» Ziegler, F. SIK report 746. Environmental Life Cycle Assessment of Norway lobster (Nephrops norvegicus) caught along the Swedish west coast by creels, conventional trawls and species-selective trawls. A data report. http://www.sik.se/archive/pdf-filer-katalog/SR746(1).pdf

Appendix 1. Scoring & Rationale

Appendix 1a – MSC Principles & Criteria

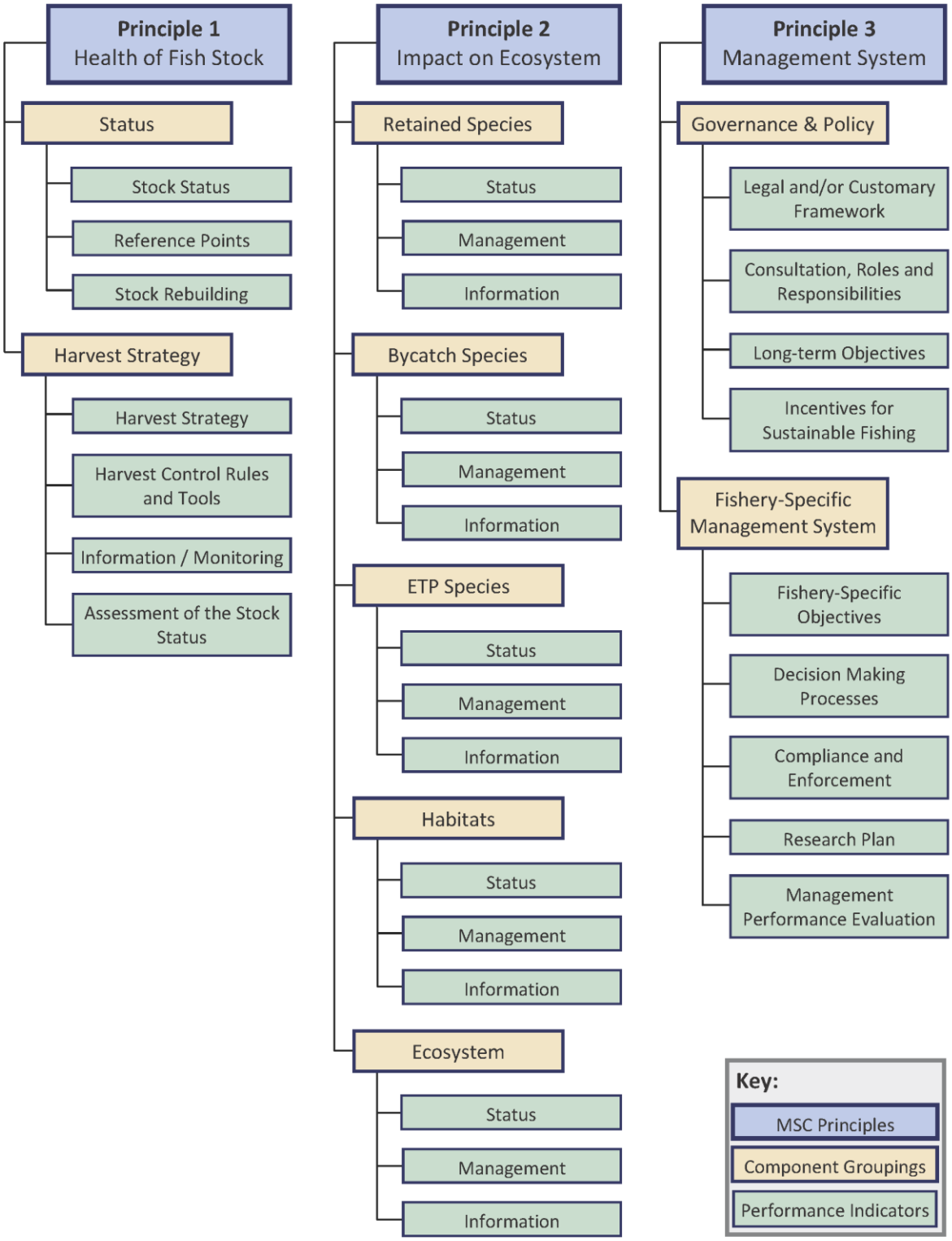


Figure A1 – Graphic of MSC Principles and Criteria

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 1.1** 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 endeavor 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.

Appendix 1.1 Performance Indicator Scores and Rationale

Principle 1: All Swedish UoCs

Evaluation Table for PI 1.1.1

PI 1.1.1		**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	All the available evidence suggests that the stock is well above the point at which recruitment would be impaired. There is no explicitly defined limit reference point for this fishery below which recruitment is expected to be impaired, but a range of stock indicators all provide evidence that there is a high degree of certainty that recruitment is not impaired. Landings have been below the TAC every year since 2000, fishing effort has been declining in recent years primarily due to kW-day restrictions designed to protect North Sea-Skagerrak and Kattegat cod stocks, and standardised landings per unit effort (LPUE) have been increasing in recent years. Yield-per-recruit analysis of observed length distributions show that the fishery has generally been exploited at a level of F below Fmsy. Size distributions of both the landings and discards are available for both Swedish and Danish vessels in the Skagerrak and Kattegat from at-sea sampling by onboard observers and mean sizes of landings and discards have been fluctuating without trend, suggesting that the stock is not over-exploited. The high amount of discards observed in 2007, 2008 and 2009 could indicate high levels of recruitment in these years.		
b	**Guidepost**		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	N
	Justification	The current target reference point is a harvest ratio equivalent to the Fmsy proxy (Fmax) which is the exploitation rate that should ensure that the stock is maintained at a level consistent with Bmsy. The harvest ratio reference point is used in conjunction with the estimate of stock biomass from the underwater TV survey to set a TAC for the upcoming year. In the two years since ICES has adopted an MSY approach to advice on management of the Nephrops fishery, landings have not exceeded the TAC. In 2011, the observed harvest ratio was well below the target reference point, and in 2012 the observed harvest ratio was slightly above the reference point. It can be concluded therefore that the stock is fluctuating around its target reference point. In the current method of setting TACs there are significant uncertainties around the absolute value of the harvest ratio equating to Fmax, and prior to 2011, TACs were derived using different methods (primarily the status quo), and so it cannot be concluded that there is a high degree of certainty that the stock has been fluctuating around its target reference point over recent years.		

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
References	» ICES 2009a. Report of the Benchmark Workshop on *Nephrops* assessment (WKNEPH). ICES CM: 2009/ACOM: 33. » ICES 2010b. Report of the Study Group on *Nephrops* Surveys (SGNEPS). ICES CM 2010/SSGESST: 22. Ref: SCICOM, ACOM » ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13. » ICES Advice Book 6.4.13. June 2012. North Sea. Nephrops in Division IIIa. » ICES Advice Book 6.4.14. June 2013. North Sea. Nephrops in Division IIIa.		
Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Target reference point	Harvest ratio equivalent to Fmax for combined sexes, a proxy for Fmsy	Harvest ratio = 7.9%	Observed harvest ratio for 2011 is 5.0% = 0.63 x the reference harvest ratio Observed harvest ratio for 2012 is 8.2% = 1.04 x the reference harvest ratio
Limit reference point	No explicit limit reference point defined		
OVERALL PERFORMANCE INDICATOR SCORE:			**90**
CONDITION NUMBER (if relevant):			**N/A**

Evaluation Table for PI 1.1.2

PI 1.1.2		**Limit and target reference points are appropriate for the stock**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	Since 2011 ICES advice on TACs for the fishery has been based on the MSY framework. There is an explicitly-defined target reference point of the harvest ratio equivalent to a proxy for Fmsy (Fmax) which can be estimated from a yield-per-recruit model based on observed Nephrops length distributions. This harvest ratio reference point is clearly understood and is appropriate for the stock in that it can be directly compared with an observed harvest ratio estimated from the ratio of total fishery removals (corrected for discard survival) and stock biomass estimates from the underwater TV survey. Although there is no formally defined limit reference point, it is implicit that management action would be enacted if fisheries-dependent indicators such as LPUE or stock biomass estimates from the fishery-independent underwater TV survey of Nephrops burrow complexes declined significantly.		
b	**Guidepost**		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		N	N
	Justification	There is no formally defined limit reference point for the fishery. In other Nephrops fisheries, a MSY Btrigger reference point has been defined based on the time series of biomass estimates from the TV surveys. For the Nephrops fishery in Division IIIa, there is currently too short a time series of biomass estimates from the TV survey to be able to define a limit reference point based on the lowest estimate of Nephrops biomass observed over the time series or the point at which the stock showed signs of stress.		
c	**Guidepost**		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	N

PI 1.1.2		Limit and target reference points are appropriate for the stock		
	Justification	As there are no age-based analytical assessments for Nephrops, it is difficult to estimate MSY and associated appropriate reference points. Techniques for estimating proxies for Fmsy for Nephrops were considered in detail at the ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK) meeting in 2010 (ICES, 2010a). Fmsy is the exploitation rate consistent with maintaining the stock at Bmsy, so meets the SG80. Three candidates for Fmsy were considered: F0.1, F35%SPR and Fmax. Preliminary Fmsy proxies for each stock were selected by the Working Group according to the perception of stock resilience, factors affecting recruitment, population density, knowledge of biological parameters, and the nature of the fishery including the relative exploitation of the sexes and the historical harvest rate vs. stock status. For the Nephrops stock in Division IIIa the harvest ratios which are equivalent to the various Fmsy proxies were calculated from average length frequency data from the fishery from 2008 to 2010. The estimated burrow density for this stock is defined as medium (0.3-0.8 burrows m-2), and as the observed harvest ratio in 2011 was between F0.1 and Fmax, then F35%SPR can be selected as a proxy for Fmsy. However because of the very high discard proportions observed in this fishery, F35%SPR is unusually higher than Fmax, and so Fmax is chosen as a conservative proxy for Fmsy. The harvest ratio equivalent to an exploitation rate of Fmax combined sexes (7.9%) is therefore chosen as the target reference point. The ICES WGNSSK acknowledges that the calculation of this target reference point in the form of a harvest ratio is still very much preliminary and may need further refinement, and therefore it cannot be said that it "..takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty". It does not therefore meet the SG100.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		(Not relevant	
	Justification	Although Nephrops may be prey for some groundfish species, Nephrops in the Skagerrak and Kattegat cannot be considered as a key low trophic level species against the MSC criteria. [Note: Where relevant, insert rationale for status of stocks against key LTL criteria, in addition to further rationale that key LTL requirements are met. *(Reference: CR Annex CB2.3.13- CB2.3.21)*]		
References		» ICES 2009a. Report of the Benchmark Workshop on *Nephrops* assessment (WKNEPH). ICES CM: 2009/ACOM: 33. » ICES, 2010a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 5 - 11 May 2010 ICES Headquarters, Copenhagen. ICES CM 2010/ACOM: 13. » ICES 2010b. Report of the Study Group on *Nephrops* Surveys (SGNEPS). ICES CM 2010/SSGESST: 22. Ref: SCICOM, ACOM » ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13. » ICES Advice Book 6.4.13. June 2012. North Sea. Nephrops in Division IIIa.		

PI 1.1.2	**Limit and target reference points are appropriate for the stock**
	» ICES Advice Book 6.4.14. June 2013. North Sea. Nephrops in Division IIIa.

OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**1**

Evaluation Table for PI 1.1.3

PI 1.1.3		**Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	(Y/N)		(Y/N)
	Justification	Stock not depleted – 1.1.3 not scored.		
b	**Guidepost**	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	(Y/N)	(Y/N)	(Y/N)
	Justification	Stock not depleted – 1.1.3 not scored.		
c	**Guidepost**	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	(Y/N)	(Y/N)	

PI 1.1.3		**Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe**
	Justification	Stock not depleted – 1.1.3 not scored.
References		[
OVERALL PERFORMANCE INDICATOR SCORE:		**N/A**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 1.2.1

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y
	Justification	The harvest strategy is composed of a number of elements which work together to control the exploitation rate on Nephrops and minimise the bycatch of other commercially-exploited species. Fishing effort is limited through kW-day restrictions designed to protect North Sea-Skagerrak and Kattegat cod stocks and which ensures that the Nephrops stock remains above the level at which recruitment would be impaired. There is a minimum landing size (MLS) of 40 mm carapace length, mesh size regulations and gear restrictions designed to minimise bycatch of cod and other commercially-exploited species, although the current mismatch between the MLS and the mesh size creates a high level of discards. A key element of the harvest strategy and the harvest control rule is an annual TAC based on a fishery-independent estimate of stock biomass and which is therefore responsive to changes in the state of the stock. The TAC is designed to ensure that landings do not exceed the level consistent with fishing at Fmsy and that the stock therefore fluctuates around its target reference point which is well above the level at which recruitment would be impaired.		
b	**Guidepost**	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	Restrictions on fishing effort, a range of technical conservation measures such as minimum landing size, mesh size regulations and other gear restrictions to limit bycatch, along with annual TACs are accepted components of a successful harvest strategy. All available evidence from both fisheries-dependent (landings, fishing effort, LPUE, mean size of landings and discards) and fishery-independent (TV surveys) stock indicators suggests that the harvest strategy is achieving its objectives. The harvest strategy has not been fully tested through, for example, a MSE, but it does appear to be maintaining stocks at target levels.		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	A comprehensive monitoring programme is in place for the fishery. In the trawl fishery all vessels >12m are required to complete EU log books and are equipped with a vessel monitoring system (VMS) which together provide information on landings, fishing effort and fishing position. Cross- checks of sales notes at landing ports with log book records suggest that log books are completed accurately. Smaller vessels which are not required to be fitted with a VMS fish in the same area as the larger vessels. The potting vessels in Sweden are required to complete monthly returns of catch and effort and compliance with this requirement is very good. The potting vessels are not required to carry VMS, but a cross-check of observed fishing position with recorded fishing position suggests good compliance. On-board sampling of landings and discards is undertaken by scientific observers. The underwater TV survey provides a fishery-independent estimate of stock biomass. Dockside monitoring of landings and at-sea inspections of the gear show that there is no systematic non-compliance with regulations. Stock indicators show that the Nephrops stock is in a good state, the TAC is rarely exceeded, and compliance monitoring shows minimal infringements, all of which demonstrates that the harvest strategy is working.		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	Whilst elements of the harvest strategy may be modified from time to time based on new information, e.g. changes in stock indicators and the results of experimental trials of gear selectivity, there is no formal process for reviewing the harvest strategy, i.e. there is no formal integrated fisheries management plan which must be regularly reviewed and updated.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Sharks are not a target species and therefore there is no need to score this issue.		

PI 1.2.1	There is a robust and precautionary harvest strategy in place
References	» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004.http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13. » ICES Advice Book 6.4.14. June 2013. North Sea. Nephrops in Division IIIa.

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

Evaluation Table for PI 1.2.2

PI 1.2.2		**There are well defined and effective harvest control rules in place**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	N	
	Justification	The key harvest control rule is that the TAC is adjusted annually based on the stock biomass estimate derived from the annual underwater TV surveys and the target harvest ratio equivalent to the Fmsy proxy of Fmax estimated from the yield-per-recruit model. The harvest control rule is designed to ensure that the stock fluctuates around the target reference point which is well above the level at which recruitment would be impaired. However it is not clear what management action would take place to reduce the exploitation rate if the stock biomass estimated from the TV survey or standardised LPUE from the fishery fell significantly towards an implicit limit reference point. . The Fmsy proxy framework adopted by the ICES WGNSSK would implicitly reduce the exploitation rate by using a lower target harvest ratio if the burrow density estimate from the TV survey dropped below 0.3 burrows m-2, but this cannot be considered to be an explicit, well-defined harvest control rule as it is not a formally agreed management action. The fishery does not therefore meet the SG80.		
b	**Guidepost**		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		N	N
	Justification	Whilst an HCR is used to adjust the TAC, it does not take into account the main uncertainties. The stock biomass estimated from the TV survey incorporates a cumulative bias correction factor, but the HCR does not take into account uncertainty in the estimate of the target harvest ratio equivalent to the Fmsy proxy. Fmax is chosen as a conservative proxy for Fmsy for this fishery, but the whole approach to estimating Fmsy proxies adopted by WGNSSK can be considered as still very much “work in progress”, and further development and evaluation of the methodology is required. For example, there are uncertainties underlying growth parameter estimates and the estimate of discard survival. In addition the HCR assumes that the stock biomass at the beginning of the year is the same as the stock biomass estimated from the TV survey in the previous year, and in a declining stock this would overestimate the stock biomass and thus deliver a positively-biased TAC.		

PI 1.2.2		There are well defined and effective harvest control rules in place		
c	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	N
	Justification	The main tool used to implement the harvest control rules is the TAC. All the available evidence indicates that the TACs are not systematically exceeded. The consensus view amongst fishers, scientists and managers is that current restrictions on fishing effort are such that it is highly unlikely that catches will reach the TAC. The current approach was implemented only two years ago, so the evidence is not yet available to clearly show that the tools in use are consistently effective at controlling exploitation levels.		
References		» ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13. » ICES Advice Book 6.4.13. June 2012. North Sea. Nephrops in Division IIIa. » ICES Advice Book 6.4.14. June 2013. North Sea. Nephrops in Division IIIa.		

OVERALL PERFORMANCE INDICATOR SCORE:	**65**
CONDITION NUMBER (if relevant):	**2**

Evaluation Table for PI 1.2.3

PI 1.2.3		**Relevant information is collected to support the harvest strategy**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	Y
	Justification	There is a comprehensive range of information on stock structure and stock productivity, the fleet composition is well known and fishing activity is comprehensively monitored through VMS records for the >12m sector of the fleet. Fishing positions recorded by <12m vessels are cross-checked with observed fishing positions. The management area of Division IIIa (Skagerrak and Kattegat) is now fully aligned with the biological stock and the scale at which the stock is assessed. The two assessment units, FU 3 & 4, were previously assessed separately, but are now combined into a single assessment as there are no real differences in Nephrops size compositions between the two areas and recruits are exchanged between the two areas. Genetics studies using a range of techniques showed significant genetic differentiation between populations of Nephrops across Europe but without a clear geographical pattern, and although there is a current research programme investigating the genetics of Nephrops in the region, there is no evidence to date of any genetic differentiation between Nephrops populations in the Skagerrak and Kattegat. Stock abundance is estimated directly through a fishery-independent TV survey, and is inferred from trends in standardised LPUE from EU fishery log books from trawlers and from monthly log book returns from potting vessels. Size distribution of landings and discards is available from on-board sampling by scientific observers, biological parameters are available for stock assessment models and an estimate of discard survival is available. Fishery removals are thoroughly documented through EU log books and cross-checked with fishery returns. Detailed habitat mapping of the Skagerrak and Kattegat permits evaluation of the extent of fishing activity in relation to habitat type. Information on grain size of the various habitats may provide additional information on Nephrops size and abundance. Groundfish predator abundance is available for the area, and monitoring of oxygen content of the water provides information on potential changes in emergence behaviour of Nephrops, which in turn can influence catch rates.		
b	**Guidepost**	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	Met?	Y	Y	N
	Justification	Stock abundance is estimated on an annual basis directly through a fishery-independent TV survey of Nephrops burrow complexes, and is inferred from long term trends in standardised LPUE from EU fishery log books. Harvest ratio reference points are based on cohort models using average size distributions in recent years. Fishery removals are well-documented through EU log books and fishery returns and are closely monitored to ensure that annual TACs are not exceeded. There is a good understanding of the inherent uncertainties in the data. There are uncertainties about growth parameters and discard survival estimates. Estimates of stock biomass from the TV surveys incorporate a cumulative bias correction factor taking into account detection rate, species identification and (most importantly) edge effects. Time trends in standardised LPUE are known to be affected by selective targeting behaviour, sudden changes in catchability due to environmental conditions or through changes in management regimes, and cross-checking of log book returns with fishery returns confirm the validity of log book returns. Despite the wealth of knowledge on the uncertainties in the data and information available, there is very little knowledge of the robustness of the assessment and management to this uncertainty, so the fishery does not meet the SG100.		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	Fishery removals from the trawl and creel sectors of the Nephrops fishing fleet are well documented, and whilst in both Sweden and Denmark there is some low level recreational catch of Nephrops in the coastal areas that goes unrecorded, these catches are considered to be minimal in relation to the commercial fishery.		
References		» Bagge, O.; Nielsen, E.; Mellergaard, S.; Dalsgaard, I., 1990: Hypoxia and the demersal fish stock in the Kattegat (IIIa) and Subdivision 22. ICES C.M. E: 4, 52 pp. » Campbell, N., Dobby, H., and Bailey, N. 2009. Investigating and mitigating uncertainties in the assessment of Scottish *Nephrops norvegicus* populations using simulated underwater television data. ICES Journal of Marine Science 66: 646–655. » ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13. » ICES. 2012b. Report of the Study Group on *Nephrops* Surveys (SGNEPS), 6–8 March 2012, Acona, Italy. ICES CM 2012/SSGESST: 19. 36 pp. » Stamatis, C., Triantafyllidis, A., Moutou, K. A., and Mamuris, Z. 2004. Mitochondrial DNA variation in Northeast Atlantic and Mediterranean populations of Norway lobster, *Nephrops norvegicus*. Molecular Ecology, 13: 1377–1390.		

PI 1.2.3	Relevant information is collected to support the harvest strategy
	» Stamatis, C., Triantafyllidis, A., Moutou, K. A., and Mamuris, Z. 2006. Allozymic variation in Northeast Atlantic and Mediterranean populations of Norway lobster, Nephrops norvegicus. ICES Journal of Marine Science, 63: 875-882. » Ulmestrand, M., and Eggert, H. 2001. Growth of Norway lobster, *Nephrops norvegicus* (Linnaeus 1758), in the Skagerrak, estimated from tagging experiments and length frequency data. ICES Journal of Marine Science, 58: 1326-1334. » Wileman, D.A., G. I. Sangster, M. Breen, M. Ulmestrand, A. V. Soldal and R.R. Harris, 1999. Roundfish and *Nephrops* survival after escape from commercial fishing gear. EC Contract No: FAIR-CT95-0753. Final Report 1999. 125 p + appendix, e
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 1.2.4

PI 1.2.4		**There is an adequate assessment of the stock status**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	Y
	Justification	The key component of the assessment is an annual estimate of stock biomass from the fishery-independent underwater TV survey of burrows. The TV survey is highly appropriate for Nephrops stocks as it counts Nephrops burrow complexes and not individual animals and therefore provides an index of abundance which is not influenced by diurnal and seasonal variations in emergence behaviour which can bias stock indicators based on traditional fisheries data. A yield-per recruit cohort model based on observed Nephrops length distributions is used to estimate harvest ratios equivalent to a range of fishing mortalities which act as proxies for Fmsy. Fmax is the value of fishing mortality, which is considered by the ICES WGNSSK as the best proxy for Fmsy for this stock, and the harvest ratio equivalent to Fmax is used therefore to define the target reference point. The length-based yield-per-recruit stock assessment model is appropriate for a species such as Nephrops which cannot be aged. The estimate of stock biomass from the TV survey is used in conjunction with an estimate of total fishery removals from the stock to provide an observed harvest ratio, which is then compared with the target harvest ratio to evaluate the status of the stock. In addition the observed stock biomass and the target harvest ratio are used within the harvest control rule to set a TAC for the upcoming year. Time series of landings, effort and standardised LPUE are used as additional indicators of stock status. Trends in mean sizes of both landings and discards are also available.		
b	**Guidepost**	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	The assessment estimates an observed harvest ratio from the total removals in the fishery (landings + dead discards assuming a discard survival rate of 25%) and the absolute estimate of stock biomass generated from the underwater TV survey. This observed harvest ratio can be compared directly with a pre-defined harvest ratio reference point equivalent to a proxy for Fmsy (Fmax) derived from a cohort model based on observed Nephrops length distributions.		
c	**Guidepost**	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	N

PI 1.2.4		There is an adequate assessment of the stock status		
	Justification	The major uncertainties within the assessment are known. Uncertainties in biomass estimates due to the underlying methodology of the TV surveys are well understood and are under continuous review within the ICES SGNEPS. The assessment takes into account these uncertainties by incorporating a cumulative bias correction factor taking into account detection rate, species identification and (most importantly) edge effects. The overall cumulative bias for Nephrops in Division IIIa is 1.1, meaning that the TV survey is likely to overestimate Nephrops abundance by 10%. The assessment of stock status is determined by comparison of the observed harvest ratio against a pre-determined target harvest ratio reference point which is a precautionary choice from a series of options., The calculation of the target harvest ratio incorporates cohort analysis using length distributions for which the underlying uncertainties are well understood (primarily that it is a steady-state model using the average of three years length distributions in this assessment) although the WGNSSK report states clearly that the values of Fmsy proxies and their equivalent harvest ratios are preliminary estimates which need further validation. Whilst there are uncertainties underlying the calculation of target harvest ratios, these uncertainties have been addressed previously with a condition raised against PI 1.2.2, As the key component of the assessment, the annual estimate of stock biomass from the fishery-independent underwater TV survey of burrows, takes uncertainty into account, the SG80 is met. Stock status is not evaluated relative to reference points in a probabilistic manner.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	Alternative assessment approaches have been used previously for Nephrops. An age-based virtual population analysis (VPA) was used previously, but there were significant uncertainties in relation to the “length-slicing” technique, which converted Nephrops length distributions to age distributions. A multiple indicator technique has also been used previously as a fore-runner to the current approach of combining a fishery-independent estimate of stock biomass with a yield-per-recruit analysis from length distribution data. The current methodology has the benefit that it can be applied to a biomass estimate from a single year’s TV survey, without requiring a time series of biomass estimates, but the approach is still relatively new for this Nephrops stock and has not been fully tested through, for example, an MSE. It cannot be concluded therefore that the assessment has been demonstrated to be robust.		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y

PI 1.2.4		There is an adequate assessment of the stock status
	Justification	The stock assessment is undertaken within the ICES system and is therefore subject to peer review annually within the WGNSSK group meetings, and subsequently by the ICES Review Group which will contain stock assessment scientists who are not involved with Nephrops assessments and who are not members of the WGNSSK. The underwater TV survey methodology is also regularly reviewed by the ICES SGNEPS. There have been regular benchmark assessments of Nephrops stocks, and the assessment methodology will be reviewed at the ICES WKNEPH 2013 Benchmark Workshop on Nephrops Stocks, attended by both ICES Expert Group members and invited outside experts. Following the review of the assessment within ICES, it will also be reviewed by STECF. The assessments can therefore be considered as externally peer-reviewed.
References		» Campbell, N., Dobby, H., and Bailey, N. 2009. Investigating and mitigating uncertainties in the assessment of Scottish *Nephrops norvegicus* populations using simulated underwater television data. ICES Journal of Marine Science 66: 646–655. » ICES 2007. Report of the Workshop on the use of UWTV surveys for determining abundance in *Nephrops* stocks throughout European waters (WKNEPHTV). ICES CM: 2007/ACFM: 14 » ICES 2009a. Report of the Benchmark Workshop on Nephrops assessment (WKNEPH). ICES CM: 2009/ACOM: 33. » ICES 2010b. Report of the Study Group on Nephrops Surveys (SGNEPS). ICES CM 2010/SSGESST: 22. Ref: SCICOM, ACOM » ICES. 2012a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). 27 April - 3 May 2012 ICES Headquarters, Copenhagen. ICES CM 2012/ACOM: 13. » ICES. 2012b. Report of the Study Group on *Nephrops* Surveys (SGNEPS), 6–8 March 2012, Acona, Italy. ICES CM 2012/SSGESST: 19. 36 pp. » ICES Advice Book 6.4.13. June 2012. North Sea. Nephrops in Division IIIa. » ICES Advice Book 6.4.14. June 2013. North Sea. Nephrops in Division IIIa. » Ulmestrand, M., and Eggert, H. 2001. Growth of Norway lobster, *Nephrops norvegicus* (Linnaeus 1758), in the Skagerrak, estimated from tagging experiments and length frequency data. ICES Journal of Marine Science, 58: 1326-1334. » Wileman, D.A., G. I. Sangster, M. Breen, M. Ulmestrand, A. V. Soldal and R.R. Harris, 1999. Roundfish and *Nephrops* survival after escape from commercial fishing gear. EC Contract No: FAIR-CT95-0753. Final Report 1999. 125 p + appendix, e

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Principle 2

UoC 1 Skagerrak Trawl GRID

Evaluation Table for PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	N (see SG60c)	N (see SG80c)	N
	Justification	According to STECF 2012 data on landings and bycatch (see Table 5), and due to its vulnerability and commercial importance, the assessment team is considering cod as a main retained species,		

STECF 2012 data. Swedish grid. Skagerrak Sea.

FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of Catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	443,845	99,16	574,824	56,43	1018,669	90,47
COD	**Cod**	0,054	0,01	10,733	99,50	10,787	0,96
Total main retained species		**443,899**	**99,17**	**585,557**	**N/A**	**1029,456**	**91,43**
TOTAL (All retained species)		**447,623**	**100**	**678,304**	**N/A**	**1125,927**	**100**

ICES 2013 advice for cod in the North Sea shows that the species has reached a gradual improvement in the status of the stock over the last few years in the Skagerrak and is now in the vicinity of Blim, but target reference points are not reached yet.

Cod is the only main retained species and as it is considered to be outside biologically based limits, it is considered further under SG60c and SG80c.

b	**Guidepost**			Target reference points are defined for retained species.
	Met?			Y
	Justification	Cod stock status has been studied for many years. Its target reference points are defined and can be checked at 2013 ICES advice for cod.		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The team considers that the grid drastically reduces the catch of cod, and considers the use of the grid as a partial strategy that ensures that the fishery does not hinder the recovery and rebuilding of the cod stock. The long term recovery plan for cod stocks (CR 1342/2008), the quota system, and effort restrictions enforced through a reduction in kW-days in direct proportion to reductions in fishing mortality all contribute to the partial strategy. The recovery plan has proven to be effective in the Skagerrak Sea, as the status of the cod stock has gradually improved over the last few years and is now in the vicinity of Blim.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of the cod is very well known over the years. Besides, the use of grid is expected to avoid the catch of any other retained species.		
References		» ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.2

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There´s a comprehensive EU recovery plan for cod under CR 1342/2008 which is considered as a management strategy for cod.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	ICES Advice 2013 for cod in the North Sea (including Skagerrak) suggests that the cod recovery plan for North Sea is working in improving stocks, albeit the low levels that the stock still poses. Testing also supports that the use of the grid highly contributes to the avoidance of cod catches, as grid systems tested in the North Sea Nephrops fishery demonstrated a 100% reduction in cod ≥35 cm (Catchpole et al., 2006).		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
	Justification	The cod recovery plan has been in place since 2008 under CR 1342/2008. It is considered that it is successfully implemented, and it is sufficient for helping the recovery of cod. The use of selective devices became mandatory in Sweden in 2004, with most of the fleet adopting the use of selective grids.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Cod stock status is improving, however, the team considers that the strategy is not yet achieving its overall objective, as Spawning Stock Biomass of cod is just around the limit reference point and Fishing mortality is still above the recommendations.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		» Catchpole, T.L., Revill, A.S., Dunlin, G. An assessment of the Swedish grid and square-mesh codend in the English (Farn Deeps) Nephrops fishery. Fisheries research, Vol.81, Issues 2-3. November 2006. http://www.sciencedirect.com/science/article/pii/S0165783606002906 » Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004.http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.3

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	Y
	Justification	The team considers that the information from logbooks, landings data, fishery auctions, SWAMN and SLU observers provides a range of qualitative and quantitative information which has been recorded for some years. Data are also available at STECF website. As the status of the cod is very well studied a SG100 is given.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	ICES estimates outcome status, but with the given information it is not possible to quantitatively estimate the outcome status with a high degree of certainty		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	The team considers that information provided by ICES advices is adequate to support the cod recovery plan and evaluate if it is achieving its overall objective.		

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y
	Justification	ICES consider the landings of retained species as part of stock assessment. SWAMN and SLU continue to monitor the catches of this unit of certification. Cod is under a recovery plan and we can assume that is being monitored in a sufficient detail to assess ongoing mortalities. Therefore a SG100 is given.		
References		» Agnew DJ, Pearce J, Pramod G, Peatman T, Watson R, et al. (2009) Estimating the Worldwide Extent of Illegal Fishing. PLoS ONE 4(2): e4570. doi:10.1371/ journal.pone.0004570. http://www.plosone.org/article/info:doi/10.1371/journal.pone.0004570 » Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » ORCA-EU, The Fisheries Secretariat (FiSH) (2007). A report on IUU fishing of Baltic Sea. http://www.fishsec.org/downloads/1198235739_21059.pdf » Valentinsson, D. & Ulmestrand, M. Species-selective Nephrops trawling: Swedish grid experiments. Science Direct. 90 (2008) 109-117. http://www.sciencedirect.com/science/article/pii/S0165783607002536 » Ziegler, F. SIK report 746. Environmental Life Cycle Assessment of Norway lobster (Nephrops norvegicus) caught along the Swedish west coast by creels, conventional trawls and species-selective trawls. A data report. http://www.sik.se/archive/pdf-filer-katalog/SR746(1).pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N

PI 2.2.1	The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups

Justification

There are no main bycatch species to consider in this UoC. Nephrops and cod constitute 91% of the total catch. The other 9% of the catch consists of the following species:

STECF 2012 data. Swedish grid. Skagerrak Sea.						
FAO code	**Species**	**Landings (Tonnes)**	**Discards (Tonnes)**	**% of Catch discarded**	**Catch (Tonnes)**	**% of Total Catch**
DAB	Dab	0,088	34,945	99,75	35,033	3,11
PLE	Plaice	0,801	19,514	96,06	20,315	1,80
FLX	Flounder	0,115	10,381	98,90	10,496	0,93
WIT	Witch	0,071	9,586	99,26	9,657	0,86
WHG	Whiting	0,931	6,864	88,06	7,795	0,69
HKE	Hake	0,086	4,105	97,95	4,191	0,37
SRX	Rays, stingrays and mantas	0,005	2,338	99,79	2,343	0,21
HAD	Haddock	0,042	2,04	97,98	2,082	0,18
LEM	Lemon sole	0,077	1,805	95,91	1,882	0,17
POK	Saithe	0,007	0,357	98,08	0,364	0,03
ANF	Anglerfish	0,019	0,21	91,70	0,229	0,02
LIN	Ling	0,003	0,104	97,20	0,107	0,01
TOTAL		**447,623**	**678,304**	**N/A**	**1125,927**	**100**

ICES Advice for Plaice (2013) considers plaice in Skagerrak closely associated with plaice in the North Sea and is proposed to be included in the North Sea plaice stock assessment, although it is recognized that local components are present in the area. In the Western component, plaice would be constituted of a mixture of local components intermingling with the North Sea stock. In the Eastern component, adult plaice would be only constituted of local components although nursery grounds would also host North Sea juveniles. This means that while the assessment unit includes the North Sea, Division VIId, and the Skagerrak, and the combined assessment is run accordingly, the management harvest control rules should take into account the presence of different components in the area. The local components in the Skagerrak should thus be managed separately. For the Western component the biomass in the last three years (2011–2013) is 7% higher than the average of the five previous years (2006–2010). Conversely, in the Eastern component, the biomass is considered depleted. The biomass in the last three years (2011– 2013) is 19% lower than the average of the five previous years (2006–2010). Catches in the Eastern area are very low (under 1% of the Skagerrak catches in 2012), but the actual exploitation rate is uncertain due to the reduced stock status. Therefore, no directed fisheries should occur and bycatch and discards should be minimized in this Eastern component.

For this reason (among others) it can´t be said that all bycatch species are within biologically based limits.

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
b	Guidepost	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	There are no species to consider under the main bycatch species definition.		
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The team considers that as there are no main bycatch species and there is a low proportion of bycatch species (9% of total catch), SG60 is met. The high control on the gears and mesh sizes, the technical conservation measures, the cod recovery plan and the assigned quotas prevent the area from fishing overexploitation.		
References		» ICES 2013 Advice for plaice. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf » WG NEW (2013) http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGNEW/WGNEW%20report%20160513.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.2

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	As there are no main bycatch species to consider, SG80 is met. Regarding all bycatch species, the use of the grid, technical regulations on the gear, TACs, minimum landing sizes, and the management measures related to the cod recovery plan are considered as a strategy for minimizing bycatch, which is only 9% of total catch. Total bycatch of the fishery is still considerable (although a significant proportion of this bycatch is undersized nephrops).		

SW grid. Skagerrak Sea	
Landings (Tonnes)	447,623
Discards (Tonnes)	678,304
% Discards	60,24
% Landings	39,76

b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	The fishery is very well regulated and measures are working in the Skagerrak, as the proportion of bycatch has decreased considerably since the use of the grid. The different LTMP in the area (for cod, haddock, saithe and herring), along with MLS, fishing effort control and quota regulations can be seen as a partial strategy that is working in the avoidance of bycatch. However, the grid hasn´t proved to be efficient in the avoidance of flatfish (see bycatch proportions in UoC2). For this UoC there are no main bycatch species to consider, therefore a SG80 is given. A lower discard ratio would support a SG100.		

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	The strategy has been implemented since the use of the grid became mandatory in 2005 and the cod recovery plan was established in 2008. There have been a great number of experimental trials that show that the grid is very effective in avoiding the catch of roundfish such as cod, which was the main species to avoid due to its poor status.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Cod recovery plan is a big part of this strategy. As the recovery of the cod has not yet been reached and the use of the grid shows some difficulties in the avoidance of flatfish, it can´t be said that the strategy is achieving its overall objective. This SG is not met.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Fiskeriverket. Measures to allow more accurate estimates of fisheries bycatch and their effect on endangered species and stocks. 2007-06-29 » WG NEW (2013). http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGNEW/WGNEW%20report%20160513.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.3

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Information on bycatch has been recorded with onboard observers for a long period by SLU. Also STECF has a record of various years. But the team can´t assert that this information is accurate on all bycatch species, as it is difficult to find information on non-commercial species and to know the status of affected populations. Besides that, some species (rays, stingrays and mantas) are recorded under the same name.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The team considers that information should be sufficient to estimate outcome status for bycatch species, but not enough to do so in a quantitative way for all species (such as rays, stingrays and mantas).		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	The team considers that information is adequate to support a partial strategy, but not enough to support a strategy to manage all bycatch species, as there´s still a lack of data on some species, reported under a unique section in STECF records.		

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	Y
	Justification	Data on bycatch is being collected by SLU observers. The collection of these data is very thorough and all information is open to the general public and can be downloaded at the STECF website.		
References		» Feekings J, Bartolino V, Madsen N, Catchpole T (2012) Fishery Discards: Factors Affecting Their Variability within a Demersal Trawl Fishery. PLoS ONE 7(4): e36409. doi:10.1371/journal.pone.0036409 http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0036409 » Fiskeriverket. 2007. Åtgärder för att möjliggöra noggrannare uppskattningar av fiskets bifångster samt deras effekter på hotade arter och bestånd. (Measures to allow more accurate estimates of fisheries bycatch and their effect on endangered species and stocks). Page 15. » Hornborg, S. et al. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated using a life cycle approach. Marine Policy (2012) Figure 4, Page 5. http://www.sciencedirect.com/science/article/pii/S0308597X12000346 » SwAMN, 2013. Regeringsuppdrag om kontroll av förbud mot utkast av fisk i Skagerrak. Regeringsuppdrag L2013/1017/JFS (page 17). https://www.havochvatten.se/download/18.3f5692b613e6622a2eb135a/1369980528925/Regeringsuppdrag+om+kontroll+av+utkastf%C3%B6rbud+i+Skagerrak+L2013_1017_JFS.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 2.3.1

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	N
	Justification	Endangered, Threatened and Protected species are those that are recognized by binding international agreement (e.g. CITES) or legislation (e.g. Council Regulation No 43/2014, such as harbour porpoise or common skate. None of the species listed in section 3.4.3 were recorded in the client endangered species records for 2012. Besides, the escape window before the grid facilitates the escape of bigger animals. It is highly unlikely that marine mammals and cetaceans interact with this fishery. Northridge (1988) provided several reasons why this species normally avoids the catch on demersal gears. The team concludes that the effects of the fishery are highly likely to be within limits on national and international requirements for the protection of ETP Species. The team can´t give a SG score of 100 because of the lack of a comprehensive record of all catches of ETP species for the grid fleet. This lack of data eliminates this high degree of certainty.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N
	Justification	After the site visit, the team concludes that directed fisheries are highly unlikely to create unacceptable impacts on the species listed in 3.4.3.. For species subject to a landing ban, they are returned to the water when fished. If this return is done quickly there´s a high probability for these species to survive, as different studies show. (Mandelman and Farrington 2007, Revill et al.2005, Enever et al 2009, Enever et al. 2010)		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**
	Justification	Indirect effects of the fishery such as habitat destruction, destruction of egg cases or competition for forage 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.
References		» Enever, R., Catchpole, T.L, Ellis, J.R. and Grant, A. 2009. The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research, Volume 97, Issues 1-2, April 2009, Pages 72-76 http://www.sciencedirect.com/science/article/pii/S0165783609000046 » Enever, R. Revill, A. Caslake, R. and Grant, A. 2010. Discard mitigation increases skate survival in the Bristol Channel. Fisheries Research, Volume 102, Issues 1-2, February 2010, Pages 9-15. http://www.sciencedirect.com/science/article/pii/S0165783609002598 » Mandelman, J.W., and M.A. Farrington. 2007a. The estimated short-term discard mortality of a trawled elasmobranch, the spiny dogfish (*Squalus acanthias*). Fisheries Research 83 (2007) 238–245. http://www.sefsc.noaa.gov/sedar/download/S21_RD16_Mandelman%26Farrington2007.pdf?id=DOCUMENT » Northridge, S. An updated world review of interactions between marine mammals and fisheries. FAO fisheries technical paper, 251. http://www.fao.org/docrep/003/t0452e/t0452e00.htm » » 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. http://www.sciencedirect.com/science/article/pii/S0165783604001870
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.3.2

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimize mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y

	Justification	There are measures that are designed to manage impacts of commercial fisheries on ETP species specifically. There is also regulatory protection of ETP species and records on the ETP species caught. There are Action Plans for Threatened Species of Fish and Shell (Finfo 2007:7). All these measures are considered to constitute a comprehensive strategy to manage ETP species. These measures include: a) Annual EU fishing opportunities regulations. 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. 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. b) 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 set out limits for fishing effort by mobile gears according to mesh size used (TR1, TR2) c) 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. d) 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*." e) 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. f) 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.

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	Y
	Justification	The team concludes that there is an objective basis for confidence that the strategy will work, as there is a high number of measures, a strict effort control, and a code of conduct establishing steps to take in the event of interactions with ETP species. ETP species in the area have been sampled in Sweden since 2005. For all the above reasons, the team concludes there is a high confidence that the strategy will work.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	Finfo 2007:7 action plan is implemented since 2007, but the team could not ascertain if all elements of the strategy were fully implemented. The lack of direct data from this fishery makes it difficult to check if all the elements of the strategy are successfully implemented.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	The team hasn´t found evidence of the absence of landings for these species and there are still remaining doubts about the correct identification of all ETP species.		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
References	» ASCOBANS (2004). Annual national reports submitted to the Secretariat as of 27 April 2004 (Belgium, Germany, Sweden, and UK). Document AC11/Doc. 30(S) presented at the 11th Advisory Committee meeting to ASCOBANS, Jastrzebia Góra, Poland, 27 – 29 April, 2004. http://www.ascobans.org/pdf/ac11/ac11-30.pdf » ICES (2010) Report of the study group on Bycatch of Protected Species (SGBYC).ICES ADVISORY COMMITTEE. ICES CM 2010/ACOM:25 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/SGBYC/sgbyc_final_2010.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.3

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Sampling records (from 2005 onwards) and Danish fleet records provide information that should be sufficient to allow a quantitative estimation of fishery related mortality of ETP species but not enough to quantitatively estimate outcome status of ETP species.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	SLU observer programs and STECF data reports are considered to be adequate to support ongoing monitoring of the fishery's impacts on these species as well as measuring trends, while also to effectively support a strategy to manage impacts. This should be sufficient to determine whether the fishery may be a threat to the protection and recovery of these species. SG 100 can´t be met as the information is not enough to know the magnitude of all impacts and injuries caused to ETP species.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	The team considers that the volume of data provided by ongoing monitoring programs on ETP species is adequate to support measures to manage the impacts on these species, notwithstanding these trends have not yet been measured due to the short record history. Yet, the complete information that is collected should be enough to do so in a short time.
References		» OSPAR 2010. Background Document for Common skate *Dipturus batis*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf »
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	The team considers that with Nephrops fisheries targeting softer mud or sandy mud sediment it is highly unlikely that trawling activity would cause irreversible harm. According to Trimmer *et al* (2005) biogeological processes in the upper layers of sediment, both oxic and anoxic, seem unaffected by trawling in the long term. Benthic trawling can alter the organic structure of sediments through a combination of the removal of surficial sediments and the turnover and burial of organic matter (Mayer *et al*. 1991, Watling *et al.* 2001, as cited in Trimmer *et a*l 2005). Jennings *et al.* (2002) showed that the small infauna community (largely polycheates) is unaffected by trawling activity. Since small infaunal polychaetes are a key source of food for flatfishes, the research concluded that beam trawling disturbance does not have a positive or negative effect on their food supply. It is however accepted that trawl gear does impact habitats.Fishing strategy includes the fishing of one vessel after another on the same area, which would reduce the area where these impacts may take place. Fishing intensity of the Swedish fisheries for lobster, cod and other benthic fish were studied in the Kattegat (area of study: 21.000 km2) for the period 2001-2003 (Gislason, page 62. 2013). Nilsson & Zieger (2007) found that more than 44% of the seabed was being fished. The study showed that 55% of hard bottom and 41% of mud bottom was trawled more than twice a year. The study did not include the Danish fishing, and the effects on bottom organisms were not investigated.		
References		» Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. http://icesjms.oxfordjournals.org/content/60/2/371.full » Gislason, H. et al. 2013. Miljøskånsomhed og økologisk bæredygtighed i dansk fiskeri. DTU 2013. Journal nr 12/09478 (Sustainability and ecology of Danish fisheries) http://levendehav.dk/wp-content/uploads/Milj%C3%B8sk%C3%A5nsomhed-og-b%C3%A6redygtighed-i-dansk-fiskeri-3.pdf » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	» Humborstad, O.-B., Nøttestad, L., Løkkeborg, S., and Rapp, H. T. 2004. RoxAnn bottom classification system, sidescan sonar and video-sledge: spatial resolution and their use in assessing trawling impacts. ICES Journal of Marine Science 61, 53-63. http://icesjms.oxfordjournals.org/content/61/1/53.full.pdf » 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Jennings S, Nicholson MD, Dinmore TA, Lancaster JE (2002) Effects of chronic trawling disturbance on the production of infaunal communities. Mar Ecol Prog Ser 243:251–260 http://www.int-res.com/articles/meps2002/243/m243p251.pdf » M. J. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. http://www.int-res.com/articles/feature/m311p001.pdf » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » OCEANA. Conservation proposals for ecologically important areas in the Baltic Sea. 2011. http://oceana.org/en/eu/media-reports/publications/baltic-conservation-proposals-for-ecologically-important-areas-in-the-baltic-sea » Pommer, C.D., “Does bottom trawling fishery have an impact on the benthis fauna in the Kattegat?” http://researchonline.jcu.edu.au/21463/3/21463_Stieglitz_and_Ridd_2011.pdf » 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. http://www.int-res.com/abstracts/meps/v298/p79-94/
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.2

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Most of the fishing effort takes place over soft seabed sediments such as mud and sandy mud, and the effort area is identified by the Vessel Monitoring Systems. Skagerrak is a studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). There are also different proposals for conservation sites by NGO´s. These Marine Protected Areas are protected from trawling due to the general trawl boundary, and the regulation to protect reefs inside this boundary. The Bratten area is protected and there are current meetings about the future zoning boundaries to protect sensitive habitats from trawling. The establishment in 2009 of the Kosterhavet National Park as the first marine national park shows an improvement in the management of marine habitats types. Therefore, the team considers that there is a strategy in place for managing the impact of the fishery on habitat types.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	N	N
	Justification	There are a large number of Natura2000 sites in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden: Varedofjorden, Store Rev, Lonstrup Rodgrund, Gule Rev, Gullmarsfjorden and Herthas flak). As shown in VMS, Skagens Gren area supports a high fishing effort which impacts the seafloor. This area is a Natura 2000 site designated to protect birds and mammals. The regulation of these areas is therefore needed. Until management measures are designed and implemented there is no objective basis for confidence that this strategy will work, as at present the strategy is limited to specifying Natura sites which should need more protection but aren´t regulated yet. Management measures need to be implemented in these areas in order to achieve a confidence in the strategy effectiveness.		

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The establishment of these protected areas is considered as evidence of the success of the implementation of this strategy, but management measures should be clearly specified, and should include the ability to modify fishing practices in the light of monitoring results. There are a large number of Natura2000 sites in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden: Varedofjorden, Store Rev, Lonstrup Rodgrund, Gule Rev, Gullmarsfjorden and Herthas flak), but, even though the need for fishing regulation in these areas is known, this regulation is not yet implemented.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			N
	Justification	The team considers this strategy hasn´t provided evidence yet of achieving its objective.		
References		» Board of Fisheries regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea https://www.havochvatten.se/miljopolitik-och-lagar/lagstiftning/svensk-lagstiftning/havs--och-vattenmyndighetens-forfattningssamling/register/fiskeriverkets-foreskrifter-fifs-200436-om-fiske-i-skagerrak-kattegatt-och-ostersjon.html » Council Regulation 1342/2008. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Fish and benthic environment at the Swedish west coast, 2004-2009: Effects of jet boundary relocation and other fishing regulations. Fiskeriverter informerar. F-info 2011:6 https://www.havochvatten.se/download/18.64f5b3211343cffddb2800012608/1348912838177/finfo2011_6.pdf » http://natura2000.eea.europa.eu/# » http://www.naturstyrelsen.dk/Naturbeskyttelse/Natura2000/Natura_2000_planer/Se_Planerne/001_125/ » http://projektwebbar.lansstyrelsen.se/kosterhavet/Sv/Pages/default.aspx		

OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**3**

Evaluation Table for PI 2.4.3

PI 2.4.3		**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	N
	Justification	This area has been very well studied over the years and there are numerous studies on the distribution of all main habitats types. But the fact that new areas are still proposed as Marine Protected Areas and some of them have just received such consideration (as the coral reefs in the Bratten area, which was declared protected area just in 2011) makes it difficult for the team to assert that all vulnerable habitat types are known.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	Trawling activity generates disturbance on muddy and sandy sediments, as they are suspended in the water column and relocated again. Effects such as bottom damage, seabed relief, sediment sorting and species survival, abundance and recovery have been studied in different research programmes. The team considers that there is enough information to identify the nature of the impacts and the spatial and temporal extent of the interaction.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	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 these data are available for assessing the scale of risk to habitat on an ongoing basis. 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. The Danish NOVANA Programme is responsible for monitoring habitat distributions and characteristics. There is also a great involvement of different NGO´s in the study of these habitats.
References		» Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic populations caused by trawl fisheries on the Dutch continental shelf in the North Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331. http://icesjms.oxfordjournals.org/content/57/5/1321.abstract » Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L., and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. http://icesjms.oxfordjournals.org/content/60/2/371.full » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235 » ICES WGMHM REPORT 2009: Report of the Working Group on Marine Habitat Mapping. http://www.aquabiota.se/publikationersveng/pdf/wgmhm09.pdf » 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. http://icesjms.oxfordjournals.org/content/55/3/353.full.pdf » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » Løkkeborg, S. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO Fisheries technical paper 472. 2005 http://www.fao.org/docrep/008/y7135e/y7135e00.htm » NOVANA Programme: National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment. http://www.naturstyrelsen.dk/Naturbeskyttelse/National_naturbeskyttelse/Overvaagning_af_vand_og_natur/NOVANA+Program/

PI 2.4.3	**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.1

PI 2.5.1		**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	N
	Justification	Nephrops is a low trophic level species and is common prey for numerous marine species. There is a temporal coincidence in the decline of other species and nephrops abundance, which suggests a relationship between them. Nephrops main diet consists of crustaceans, molluscs, and to a lesser extent polychaetes and echinoderms (Parslow-Williams *et al*., 2002). Differences in diet appear to be due more to changes in prey abundance than to prey preference (Parslow-Williams *et al.*, 2002) indicating that the species is an opportunistic predator. *Nephrops* are preyed upon by different species some of which are listed below: » Research in Scotland showed that 80% of cod had Nephrops norvegicus amongst their stomach contents (Thomas, 1965b). Cod is by far the main predator of the Icelandic Nephrops stock (Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication) » Nephrops was also found in 52% of the thornback ray Raja clavata that were sampled (Thomas 1965b). » In the Clyde, Nephrops was found in 51% of the small spotted catshark (dogfish) Scyliorhinus canicula that were sampled (Gordon & De Silva, 1980). Gordon et al. studied the effects of otter trawling on benthic habitat and communities on Western Bank. Although not specific to this UoC, results indicated very limited immediate impacts on the benthic community. The structure of the colonial epifaunal assemblage was not affected by repeated trawling over three years. However, the total biomass of colonial epifauna was significantly reduced. The team considers that due to the healthy status of the nephrops and the low abundance of predators it is highly unlikely that biodiversity, community structure and productivity are adversely impacted by this fishery.		
		» Björnsson, B. and Dongala Dombaxeb, M.A. ICES Journal of Marine Science. (2004) 61 (6):983-991. Quality of Nephrops as food for Atlantic cod (*Gadus morhua* L.) with possible implications for fisheries management. http://icesjms.oxfordjournals.org/content/61/6/983.abstract » Gordon, J.D.M. and de Silva, S.S. (1980). The fish populations of the West of Scotland Shelf. Part I, Oceanographic Marine Biology Annual Review, 18, 317-366. » Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication. » http://www.marlin.ac.uk/biotic/browse.php?sp=4390		

PI 2.5.1	**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**
	» Parslow-Williams P., Goodheir C., Atkinson R.J.A., Taylor A.C. Feeding energetics of the Norway lobster, *Nephrops norvegicus* in the Firth of Clyde, Scotland. Ophelia2002; 56:101-120. http://cel.webofknowledge.com/InboundService.do?SID=U2IdkSsNrYtswp8HOi8&product=CEL&UT=000178458400004&SrcApp=Highwire&Init=Yes&action=retrieve&Func=Frame&customersID=Highwire&SrcAuth=Highwire&IsProductCode=Yes&mode=FullRecord
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.2

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	The team considers that there are measures in place, such as the cod recovery plan, the establishment of Natura 2000 sites, the quota assigned, and the use of selective gears. The joint application of these measures can be considered as a partial strategy, but this falls short of a full ecosystem plan for the area.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	EU fisheries should address the precautionary and ecosystem approach in their management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help co-ordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE). Furthermore legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations and Norway-EU agreements. It is therefore assessed that there are a series of measures in place that constitute a partial strategy to ensure the impacts of the Swedish grid on the ecosystem achieve Ecosystem Outcome SG80.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	The team considers that this combination of spatial and fishery-specific management is likely to work in relation to achieving or maintaining ecosystem integrity.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N
	Justification	The designation of Natura 2000 sites, effort control, management of the fishery, inspections on board and on the landing port suggests that this partial strategy is being implemented successfully.		
References		» ICES CM 2009 ACOM Advisory Committee: 20 Report of the Working Group on the Assessment on Ecosystem Effects of Fishing Activities. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WGECO/wgeco_final_2009.pdf » ICES. 2002. Report of the Working Group on Ecosystem Effects of Fisheries. Advisory Committee on Ecosystems		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation Table for PI 2.5.3

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	Skagerrak Sea fisheries have been studied by different institutions over the years. There is relevant information to understand the key elements of the ecosystem and its functions. These key elements include the trophic structure of the Skagerrak ecosystem, such as prey, predators and competitors, community composition, productivity patterns and biodiversity characteristics. ICES reports on stocks assessment also provide relevant information to know the status of the different components of the fishery. For this reason, the team considers that the information is adequate to broadly understand the key elements of the fishery.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Main impacts of the fishery on these key elements can be inferred from existing information, such as the Mackinson & Daskalov (2007) Ecopath model of the North Sea. This model is able to answer questions such as the response of the ecosystem to changes, and can be used as a basis in the design of policies aimed at implementing ecosystem management principles, and can provide testable insights into changes that have occurred in the ecosystem over time.		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	Nephrops is a low trophic species and its relationship with other species is known. The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known. Direct and indirect impacts of the fishery on both ETP species and seabed habitats are known with a reasonable degree of accuracy.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred. This data are sufficient to allow the main impacts on these components to be inferred directly.		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	The team considers that information is sufficient to support the development of strategies to manage ecosystem impacts. Besides that, sufficient data continue to be collected through various organizations. 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. ICES Mixed fisheries advice report for the North Sea (2013) (which includes Skagerrak), gives an overview of the stocks of different species and marks a path towards ecosystem management. This advice indicates that sufficient data is collected to support the development of strategies to manage ecosystem impacts.		
References		» Annual report for the Swedish National Programme for collection of fisheries data 2012. Swedish Agency for Marine and Water Management. https://www.havochvatten.se/download/18.2a9b232013c3e8ee03e7a3f/1364904967368/Sweden_NP_Proposal_2011-2013_Text_26-Mar-2013.pdf » ICES Mixed fisheries advice for the North Sea (2013). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf		

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
	» Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp. http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	**N/A**

UoC 2: Kattegat Trawl GRID

Evaluation Table for PI 2.1.1

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	N/A	N/A	N
	Justification	According to STECF 2012 data on landings and bycatch (see Table 6), the main retained species that will be considered is cod, due to its poor stock status and its commercial importance.		

STECF 2012 data. Swedish grid. KATTEGAT SEA

FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of Catch discarded	Catch (Tonnes)	% of Total catch
NEP	Nephrops	274,393	99,03	227,089	45,3	501,482	63,05
COD	**Cod**	0,126	0,05	12,069	99	12,195	1,53
Total main retained species		274,519	99,07	239,158	46,56	513,677	64,59
TOTAL (all retained species)		**277,08**	**100**	**518,244**	**N/A**	**795,324**	**100,00**

ICES Advice 2013 for cod in Kattegat advises on the basis of precautionary considerations that there should be no directed fisheries and bycatch and discards should be minimized. SG60 is not met. Cod is the only main retained species and as it is considered to be outside biologically based limits, it is considered under SG80c rather than SG80a.

b	**Guidepost**			Target reference points are defined for retained species.
	Met?			Y
	Justification	Cod stock status has been studied for many years due its commercial importance. Target reference points are well defined by ICES.		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The team considers that the grid drastically reduces the catch of cod, and considers the use of the grid as a partial strategy that ensures that the fishery does not hinder the recovery and rebuilding of the cod stock. The long term recovery plan for cod stocks (CR 1342/2008) is a strategy seeking the recovery of cod. The quota system and the effort restrictions enforced through a reduction in kW-days in direct proportion to reductions in fishing mortality also contribute to this strategy.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of the cod is very well known over the years. Besides, the use of the grid is expected to avoid the catch of any other retained species.		
References		» ICES 2013 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.2

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There´s a comprehensive recovery plan for cod under CR 1342/2008 which is considered as a management strategy for cod.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
	Justification	ICES Advice 2013 for cod in the North Sea suggests that the cod recovery plan for North Sea is working in improving some stocks, albeit the low levels that the stock still poses. For the Kattegat stock, ICES advices states that spawning stock biomass has been at a historically lowest level since 2000, recruitment in recent years has been among the lowest in the time series and the current level of fishing mortality is unknown due to a pronounced difference between the catch data (landings plus discards estimated from observer data) and the total removals from the stock estimated within the model based on survey data. However, testing supports that the use of the grid contributes significantly to the avoidance of cod catches, as grid systems tested in the North Sea Nephrops fishery demonstrated a 100% reduction in cod ≥35 cm (Catchpole et al., 2006). DTU Aqua Notat to Naturerhvervstyrelsen on the Evaluation of cod avoidance measures in the Kattegat suggests, according to ICES cod stock assessment report and Vinther and Eero paper, that the aim of the cod management plan to reduce fishing mortality of cod ages 3-5 has worked by the introduction of cod avoidance measures. And that even though the objective to rebuild SSB to above Bpa hasn´t been reached yet, an increase in SSB has been detected. It is also stated that the current level of F is highly likely to be less than the target F of 0.4. The team concludes that there is evidence that the strategy is working for the cod, so its reaches a SG100.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	Cod recovery plan was implemented in 2009 and the use of selective gears became mandatory in Sweden in 2004, with most of the fleet adopting the use of selective grids.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Cod recovery plan is a big part of this strategy. The recovery of the cod has not yet been reached, although DTU Aqua Notat states that there has been some improvement on cod stock status, Spawning Stock Biomass is still below limit reference point and Fishing mortality is still above the recommendations.		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		» Catchpole, T.L., Revill, A.S., Dunlin, G. An assessment of the Swedish grid and square-mesh codend in the English (Farn Deeps) Nephrops fishery. Fisheries research, Vol.81, Issues 2-3. November 2006. http://www.sciencedirect.com/science/article/pii/S0165783606002906 » Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » DTU Aqua Notat on the Evaluation of cod avoidance measures in the Kattegat to NaturErhvervstyrelsen, Center for Fiskeri. 8th February 2013. Journr.: 12/09587/MV. (page3). http://stecf.jrc.ec.europa.eu/documents/43805/595663/Evaluation+od+Cod+Avoidance+measures+for+Kattegat_cod_evaluation.pdf » ICES 2013 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » ICES 2012 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/cod-kat.pdf » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf » Vinther, M., Eero M. (2013). Quantifying relative fishing impact on fish popula tion based on spatio-temporal overlap of fishing effort and stock density. ICES journal of Marine Science 2013. http://icesjms.oxfordjournals.org/content/early/2013/01/22/icesjms.fst001.short		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.3

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	Y
	Justification	The team considers that the information from logbooks, landing data, fishery auctions, SWAMN and SLU observers provides a range of qualitative and quantitative information which has been recorded for some years. Data are also available at STECF website. As the status of the cod is very well studied a SG100 is given.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	ICES 2012 advice for cod cannot estimate MSY and states that fishing mortality is unknown. Concerning SSB, the estimates are considered imprecise, however both the assessment with discards and with estimating total removals within the model indicate historically lowest SSB in recent years (in the range of 950 and 1700 tonnes in 2011). The level of SSB estimated from the assessment is in line with the independent estimates of cod biomass based on data from the joint Swedish-Danish fishermen-scientist survey. ICES estimates outcome status, but with the given information it is not possible to quantitatively estimate the outcome status with a high degree of certainty for all retained species.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	The team considers that information provided by ICES advices is adequate to support the cod recovery plan and evaluate if it is achieving its overall objective.		

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y
	Justification	SWAMN and SLU continue to monitor the catches of this unit of certification. As cod is under a recovery plan, we can assume that is being monitored in a sufficient detail to assess ongoing mortalities. Therefore it scores a SG100.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES 2013 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » ICES 2012 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2012/2012/cod-kat.pdf » ORCA-EU, The Fisheries Secretariat (FiSH) (2007). A report on IUU fishing of Baltic Sea. http://www.fishsec.org/downloads/1198235739_21059.pdf » Valentinsson D & Ulmestrand M. Species-selective Nephrops trawling: Swedish grid experiments. Science Direct. 90 (2008) 109-117. http://www.sciencedirect.com/science/article/pii/S0165783607002536 » Ziegler, F. SIK report 746. Environmental Life Cycle Assessment of Norway lobster (Nephrops norvegicus) caught along the Swedish west coast by creels, conventional trawls and species-selective trawls. A data report. http://www.sik.se/archive/pdf-filer-katalog/SR746(1).pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.1

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	According to STECF 2012 data, main bycatch species for this UoC is dab (22,46%of total catch). Other minor bycatch species would be whiting, flounder, plaice, lemon sole, hake, sole, witch, herring, cat, turbot and edible crab (15% of total catch).		

STECF 2012 data. Swedish grid. KATTEGAT SEA						
FAO code	**Species**	**Landings (Tn)**	**Discards (Tn)**	**% Discards**	**Total catch**	**% Total catch**
DAB	**Dab**	0,032	178,588	99,98	178,62	22,46
TOTAL		**277,08**	**518,244**	**N/A**	**795,324**	**100**

ICES Advice for Dab (2013) shows an increment of the abundance for the last 15 years, but still there´s not enough information to give catch advice. WG NEW (2013) suggests dab abundance is increasing, but no biologically based limits are set. SG for dab is 80.

Other minor species such as whiting or plaice don´t reach SG100.

b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	No main bycatch species are to be considered under this scoring issue.		

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of dab is not poorly known, and the amount of tonnes caught by this gear should not be enough to make the fishery being outside biological based limits. There´s a high control on the gears and mesh sizes. Technical conservation measures, cod recovery plan and quotas prevent overexploitation of this species, However, it is also true that the grid is not very effective in the avoidance of flatfish. Just very recently the EU has aggregated IIIa dab to the EU data collection framework, which would increase the accuracy of future advice. This measure is expected to increase the knowledge of its status.		
References		» Hornborg, S. et al. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated using a life cycle approach. Marine Policy (2012) Figure 4, Page 5. http://www.sciencedirect.com/science/article/pii/S0308597X12000346 » ICES 2013 Advice for dab. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/dab-nsea.pdf » ICES 2013 Advice for plaice. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf » ICES 2013 Advice for whiting in the Kattegat and the Skagerrak. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/whg-kask.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.2

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	ICES 2013 advice for dab considers dab as a limited data stock. It also states that dab discards are known to take place, but data are insufficient to estimate a discards proportion that could be applied to give catch advice. Regardless of this information, surveys show an increasing abundance in Division IIIa, so it would be difficult for this species to be outside biologically based limits, despite its high discard ratio. The use of the grid, technical regulations on the gear, TACs, minimum landing sizes, and the management measures related to the cod recovery plan are considered as a strategy for minimizing bycatch. Total bycatch of the fishery is still considerable (although the majority of this bycatch is undersized nephrops (20%) and also dab (22%)).		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N

SW grid. Kattegat Sea	
Total catch (Tonnes)	795,324
Landings (Tonnes)	277,08
Discards (Tonnes)	518,244
% Discards	**65,16**
% Landings	34,83

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
	Justification	The cod recovery plan, along with measures such as the use of the sorting grid, MLS, fishing effort control and quota regulations are considered a strategy working in the avoidance of bycatch, which is already working in the avoidance of roundfish, but hasn´t proved to be efficient in the avoidance of flatfish (22% of catch), The fishery is very well regulated and measures should work as they do in other fisheries. Hornborg et al (2012) show important discard ratios for dab in the Kattegat grid fishery, but ICES advice for dab in the area also shows an increase in its abundance, which gives confidence in the effectiveness of the strategy. High discard ratios prevent the fishery from achieving SG100. It is understood that a modified grid has been developed in an attempt to further reduce bycatch, but this is still to be implemented.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	The strategy has been implemented since the use of the grid became mandatory in 2005 and the cod recovery plan was established in 2009. There have been a great number of experimental trials that show that the grid is very effective in avoiding the catch of roundfish such as cod, which was the main species to avoid due to its poor status.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Cod recovery plan is a big part of this strategy. As the recovery of the cod has not yet been reached and the use of the grid shows some difficulties in the avoidance of flatfish, it can´t be said that the strategy is achieving its overall objective with this high rate of discards.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Hornborg, S. et al. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated using a life cycle approach. Marine Policy (2012) Figure 4, Page 5. http://www.sciencedirect.com/science/article/pii/S0308597X12000346		

PI 2.2.2	**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**
	» ICES Advice for dab. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/dab-nsea.pdf » WG NEW (2013) http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGNEW/WGNEW%20report%20160513.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.3

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Information on bycatch has been recorded with onboard observers for a long period by SLU. Also STECF has a record of various years. But the team can´t assert that this information is accurate on all bycatch species, as it is difficult to find information on non-commercial species and to know the status of affected populations.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	As stated in ICES Advice for dab, survey indices show an increasing abundance for Division IIIa. The stock size indicator (number/hour) in the last three years (2010–2012) is 16% higher (Skagerrak–Kattegat) than the average of the five previous years (2005–2009). The team considers that information is sufficient to estimate outcome status as it shows an increasing abundance, but is not enough to do it in a quantitative way.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	The team considers that information is adequate to support a partial strategy, but considers that is not enough to support a strategy to manage all bycatch species, as there´s still a lack of data on some species, as reported on the miscellanea fish section in the Hornborg et al., 2012 pie chart taken as reference.		

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	Y
	Justification	Data on bycatch is being collected by SLU observers. The collection of these data is very thorough and all information is open to the general public and can be downloaded at the STECF website.		
References		» Feekings J, Bartolino V, Madsen N, Catchpole T (2012) Fishery Discards: Factors Affecting Their Variability within a Demersal Trawl Fishery. PLoS ONE 7(4): e36409. doi:10.1371/journal.pone.0036409 http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0036409 » Hornborg, S. et al. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated using a life cycle approach. Marine Policy (2012) Figure 4, Page 5. http://www.sciencedirect.com/science/article/pii/S0308597X12000346 » ICES 2013 Advice for dab. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/dab-nsea.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

Evaluation Table for PI 2.3.1

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	N
	Justification	Endangered, Threatened and Protected species are those that are recognized by binding international agreement (e.g. CITES) or legislation (CR 43/2014), such as harbor porpoise or common skate. The client has provided record of ETP sampling by SLU since 2005 in the area. None of the species listed in section 3.4.3 were recorded in the SLU records provided by the client nor in the client endangered species records for 2012. Besides, the escape window before the grid facilitates the escape of bigger animals. It is highly unlikely that marine mammals and cetaceans interact with this fishery. Northridge (1988) provided several reasons why this species normally avoids the catch on demersal gears. The team considers that the effects of this fishery are highly unlikely to be within limits of national and international requirements for protection of ETP species. The team can´t give a SG100 as the lack of records from the fishery for a series of years eliminates this high degree of certainty.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N
	Justification	After the site visit, the team concludes that directed fisheries are highly unlikely to create unacceptable impacts on the ETP species listed in section 3.4.3. Council Regulation 57/2011 prohibits the landing of spurdog from European waters, and the retaining on board of rays is forbidden or restricted to a percentage of the catch. CR 57/2011 also establishes the obligation to report some species of ray separately. For species subject to the landing ban, if returned quickly to the water there´s a high probability for these species to survive, as different studies show. (Mandelman and Farrington 2007, Revill et al.2005, Enever et al 2009, Enever et al. 2010)		

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N
	Justification	Indirect effects of the fishery such as habitat destruction, destruction of egg cases or competition for forage effects have been considered 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.		
References		» Council Regulation (EU) No 43/2014, fixing for 2014 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in EU waters and, for EU vessels, in certain non-EU waters. » Enever, R., Catchpole, T.L, Ellis, J.R. and Grant, A. 2009. The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research, Volume 97, Issues 1-2, April 2009, Pages 72-76 http://www.sciencedirect.com/science/article/pii/S0165783609000046 » Northridge, S. An updated world review of interactions between marine mammals and fisheries. FAO fisheries technical paper, 251. http://www.fao.org/docrep/003/t0452e/t0452e00.htm » 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. http://www.sciencedirect.com/science/article/pii/S0165783604001870		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.2

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimize mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y

	Justification	There are measures that are designed to manage impacts of commercial fisheries on ETP species specifically. There is also regulatory protection of ETP species and records on the ETP species caught. There is an Action Plans for Threatened Species of Fish and Shell (Finfo 2007:7). All these measures are considered to constitute a comprehensive strategy to manage ETP species. These measures include: a) Annual EU fishing opportunities regulations. 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 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. b) 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 set out limits for fishing effort by mobile gears according to mesh size used (TR1, TR2) c) 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*." d) 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. e) 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.

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	Y
	Justification	The team concludes that there is an objective basis for confidence that the strategy will work, as there is a high number of measures, a strict effort control, and a code of conduct establishing steps to take in the event of interactions with ETP species. ETP species in the area have been sampled in Sweden since 2005. For all the above reasons, the team concludes there is a high confidence that the strategy will work.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	Finfo 2007:7 action plan is implemented since 2007, but the team could not ascertain if all elements of the strategy were fully implemented. The lack of direct data from this fishery makes it difficult to check if all the elements of the strategy are successfully implemented.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	There are still remaining doubts about the correct identification of all ETP species.		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
References	» ASCOBANS (2004). Annual national reports submitted to the Secretariat as of 27 April 2004 (Belgium, Germany, Sweden, and UK). Document AC11/Doc. 30(S) presented at the 11th Advisory Committee meeting to ASCOBANS, Jastrzebia Góra, Poland, 27 – 29 April, 2004. http://www.ascobans.org/pdf/ac11/ac11-30.pdf » ICES (2010) Report of the study group on Bycatch of Protected Species (SGBYC).ICES ADVISORY COMMITTEE. ICES CM 2010/ACOM:25 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/SGBYC/sgbyc_final_2010.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.3

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Sampling records (from 2005 onwards) provide information that should be sufficient to allow a quantitative estimation of fishery related mortality of ETP species but not enough to quantitatively estimate outcome status of ETP species with a high degree of certainty.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	SLU observer programs and STECF data reports are considered to be adequate to support ongoing monitoring of the fishery's impacts on these species as well as measuring trends, while also to effectively support a strategy to manage impacts. This should be sufficient to determine whether the fishery may be a threat to the protection and recovery of these species. SG 100 can´t be met as the information is not enough to know the magnitude of all impacts and injuries caused to ETP species.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	The team considers that the volume of data provided by ongoing sampling programs on ETP species (since 2005) should be adequate to support measures to manage the impacts on this species.
References		» OSPAR 2010. Background Document for Common skate *Dipturus batis*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	With Nephrops fisheries targeting softer mud or sandy mud sediment it is highly unlikely that trawling activity would cause irreversible harm. According to Trimmer *et al* (2005) biogeological processes in the upper layers of sediment, both oxic and anoxic, seem unaffected by trawling in the long term. Benthic trawling can alter the organic structure of sediments through a combination of the removal of surficial sediments and the turnover and burial of organic matter (Mayer *et al*. 1991, Watling *et al.* 2001, as cited in Trimmer *et a*l 2005). Jennings *et al.* (2002) showed that the small infauna community (largely polycheates) is unaffected by trawling activity. Since small infaunal polychaetes are a key source of food for flatfishes, the research concluded that beam trawling disturbance does not have a positive or negative effect on their food supply. It is however accepted that trawl gear does impact habitats. Fishing strategy includes the fishing of one vessel after another on the same area, which would reduce the area where these impacts may take place. Fishing intensity of the Swedish fisheries for lobster, cod and other benthic fish were studied in the Kattegat (area of study: 21.000 km2) for the period 2001-2003 (Gislason, page 62. 2013). Nilsson & Zieger (2007) found that more than 44% of the seabed was being fished. The study showed that 55% of hard bottom and 41% of mud bottom was trawled more than twice a year. The study did not include the Danish fishing, and the effects on bottom organisms were not investigated.		
References		» Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. http://icesjms.oxfordjournals.org/content/60/2/371.full » Gislason, H. et al. 2013. Miljøskånsomhed og økologisk bæredygtighed i dansk fiskeri. DTU 2013. Journal nr 12/09478 (Sustainability and ecology of Danish fisheries) » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235 » Humborstad, O.-B., Nøttestad, L., Løkkeborg, S., and Rapp, H. T. 2004. RoxAnn bottom classification system, sidescan sonar and video-sledge: spatial resolution and their use in assessing trawling impacts. ICES Journal of Marine Science 61, 53-63. http://icesjms.oxfordjournals.org/content/61/1/53.full.pdf		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	» 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Jennings S, Nicholson MD, Dinmore TA, Lancaster JE (2002) Effects of chronic trawling disturbance on the production of infaunal communities. Mar Ecol Prog Ser 243:251–260 http://www.int-res.com/articles/meps2002/243/m243p251.pdf » M. J. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » OCEANA. Conservation proposals for ecologically important areas in the Baltic Sea. 2011. http://oceana.org/en/eu/media-reports/publications/baltic-conservation-proposals-for-ecologically-important-areas-in-the-baltic-sea » Pommer, C.D., “Does bottom trawling fishery have an impact on the benthis fauna in the Kattegat?” http://researchonline.jcu.edu.au/21463/3/21463_Stieglitz_and_Ridd_2011.pdf » 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. http://www.int-res.com/abstracts/meps/v298/p79-94/
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.2

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Most of the fishing effort takes place over soft seabed sediments such as mud and sandy mud, and the effort area is identified by the Vessel Monitoring Systems. Kattegat is a studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). There are also different proposals for conservation sites by NGO´s. There are Marine Protected Areas that are protected from trawling due to the general trawl boundary, and the regulation to protect reefs inside this boundary. The Evaluation of closed areas in Kattegat reports that several closed areas were established in 2009 in the northern part of the Sound with the aim to protect local cod population, as it was seen that those areas were nursery areas for the cod. Notice that some areas are open to the grid fishery. These areas include: » Permanently closed area closed for all fisheries, including recreational fisheries. » Partially closed areas closed for all fisheries in the period 1st January to 31st March. Fisheries with selective gears such as the grid are allowed to fish here from 1st April to 31st December. » Bigger seasonally closed area closed from the 1st January to 31st March, except for fisheries with selective gears such as the grid. The team considers that this is a strategy in place for managing the impact of the fishery on habitat types.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	N	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Justification	The Sound area has been closed to trawling for many years and illustrates that the strategy of spatial management works when implemented. As since 2009 there is an exclusion from the effort regime for vessels fishing with a selective grid (Article 11.2.b, Cod Recovery Plan: The Council may, acting on a Commission proposal and on the basis of the information provided by Member States and the advice of STECF referred to in paragraph 3, exclude certain groups of vessels from the application of the effort regime provided that: the percentage of cod catches as assessed by STECF does not exceed 1,5 % of the total catches for each group of vessels concerned) there can´t be a high confidence in the efficiency of the strategy, as seafloor habitats protection decreases as impacts on the sea floor still occur. Swedish control 2009-2011 reported a total of 27 inspections at sea which resulted in two infringements. But air surveillance resulted in 22 reported infringements. All infringements were detected in the permanently closed area. (Evaluation of closed areas in the Kattegat, page 3). This area is very sensitive for the recovery of the cod. Management of the closed areas in Kattegat seems to be established, but there are still infringements. The fact that the grid fishery is allowed in the closed areas also hinders the recovery of these habitats. Other habitats subject to protection are the Natura2000 sites in the Kattegat (such as Anholt, Stradenge pa laeso og havet syd herfor, Havetomkring nordre runner, Laesotrindel og tonneberg banke, Kims top og den kinesiske mur, Fladen, Lilla middelgrund, Stora middelgrund och rode bank, Lysegrund, Hesselo, Morups bank). VMS maps show a higher impact of the fisheries in Kims top og den kinesiske mur, Fladen and Lilla middelgrund areas. The regulation of these areas is therefore needed. Until management measures are designed and implemented there is no objective basis for confidence that this strategy will work, as at present the strategy is limited to specifying Natura sites which should need more protection but aren´t regulated yet. Management measures need to be implemented in these areas in order to achieve a confidence in the strategy effectiveness.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The establishment of these protected areas is considered as evidence of the success of the implementation of this strategy, but the lack of defined management measures and enforcement in Natura 2000 sites, , (which should include the ability to modify fishing practices in the light of monitoring results), prevents the fishery from achieving a SG100. Therefore, a SG80 is given.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
	Justification	The team considers that there is no evidence that the strategy is achieving its objective of not posing a risk of serious or irreversible harm to habitats types, as there is still the need of implementation of management measures in some areas.
References		» Board of Fisheries regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea https://www.havochvatten.se/miljopolitik-och-lagar/lagstiftning/svensk-lagstiftning/havs--och-vattenmyndighetens-forfattningssamling/register/fiskeriverkets-foreskrifter-fifs-200436-om-fiske-i-skagerrak-kattegatt-och-ostersjon.html » Council Regulation 1342/2008. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Fish and benthic environment at the Swedish west coast, 2004-2009: Effects of jet boundary relocation and other fishing regulations. Fiskeriverter informerar. F-info 2011:6 https://www.havochvatten.se/download/18.64f5b3211343cffddb2800012608/1348912838177/finfo2011_6.pdf » http://natura2000.eea.europa.eu/# » http://www.naturstyrelsen.dk/Naturbeskyttelse/Natura2000/Natura_2000_planer/Se_Planerne/001_125/ » http://projektwebbar.lansstyrelsen.se/kosterhavet/Sv/Pages/default.aspx » SwAMN. Evaluation of closed areas in Kattegat to promote the rebuilding of the cod stock. https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**3**

Evaluation Table for PI 2.4.3

PI 2.4.3		**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	Kattegat Sea has been very well studied over the years and there are numerous studies and high resolution maps on the distribution of all main habitats types.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	Trawling activity generates disturbance on muddy and sandy sediments, as they are suspended in the water column and relocated again. Effects such as bottom damage, seabed relief, sediment sorting and species survival, abundance and recovery have been studied in different research programmes. The team considers that there is enough information to identify the nature of the impacts and the spatial and temporal extent of the interaction.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	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 these data are available for assessing the scale of risk to habitat on an ongoing basis. 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 closed areas and Natura 2000) are being undertaken and will be required to continue into the future under the Habitats Directive and under commitments to OSPAR. . The Danish NOVANA Programme is responsible for monitoring habitat distributions and characteristics. There is also a great involvement of different NGO´s in the study of these habitats.
References		» Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic populations caused by trawl fisheries on the Dutch continental shelf in the North Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331. http://icesjms.oxfordjournals.org/content/57/5/1321.abstract » Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L., and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. http://icesjms.oxfordjournals.org/content/60/2/371.full » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235 » ICES WGMHM REPORT 2009: Report of the Working Group on Marine Habitat Mapping. http://www.aquabiota.se/publikationersveng/pdf/wgmhm09.pdf » 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. http://icesjms.oxfordjournals.org/content/55/3/353.full.pdf » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » Løkkeborg, S. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO Fisheries technical paper 472. 2005 http://www.fao.org/docrep/008/y7135e/y7135e00.htm » Evaluation of closed areas in Kattegat to promote the rebuilding of cod stock https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf » DTU Aqua, 2013. Evaluation of Cod avoidance measures for Kattegat.

PI 2.4.3	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	» Greenpeace. Oresund. http://www.greenpeace.org/denmark/da/press/rapporter-og-dokumenter/2013/Oresund---et-unikt-farvand-i-Danmark/ » Madsen, N. & Valentinsson, D. 2012. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience ICES Journal of Marine Science Advance. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf+html?sid=43c94723-273e-4f6f-b5eb-4cfcd709d503 » NOVANA Programme (National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment). http://www2.dmu.dk/1_viden/2_publikationer/3_fagrapporter/rapporter/fr532.pdf » Oceana, 2011. Fisheries management in the Baltic Sea. How to get on a track to a sustainable future in Baltic fisheries. http://oceana.org/en/eu/media-reports/publications/fisheries-management-in-the-baltic-sea-how-to-get-on-track-to-a-sustainable-future-in-baltic-fishe » Oceana, 2011. Conservation proposals for ecologically important areas in the Baltic Sea. http://oceana.org/en/eu/media-reports/publications/baltic-conservation-proposals-for-ecologically-important-areas-in-the-baltic-sea » Oceana, 2013. Oceana proposal for a Marine Protected Area: Kattegat trench (Baltic Sea Project). http://oceana.org/sites/default/files/euo/OCEANA_10_Kattegat_Trench.pdf » Master's thesis by Christina Dahl Pommer, C.D., 2011. Does trawling impact the Benthic Communities in Kattegat? Master thesis. University of Copenhagen.
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.1

PI 2.5.1		**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	N
	Justification	Nephrops is a low trophic level species and is common prey for numerous marine species. There is a temporal coincidence in the decline of other species and nephrops abundance, which suggests a relationship between them. Nephrops main diet consists of crustaceans, molluscs, and to a lesser extent polychaetes and echinoderms (Parslow-Williams *et al*., 2002). Differences in diet appear to be due more to changes in prey abundance than to prey preference (Parslow-Williams *et al.*, 2002) indicating that the species is an opportunistic predator. *Nephrops* is preyed upon by different species some of which are listed below: » Research in Scotland showed that 80% of cod had Nephrops norvegicus amongst their stomach contents (Thomas, 1965b). Cod is by far the main predator of the Icelandic Nephrops stock (Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication) » Nephrops was also found in 52% of the thornback ray Raja clavata that were sampled (Thomas 1965b). » In the Clyde, Nephrops was found in 51% of the small spotted catshark (dogfish) *Scyliorhinus canicula* that were sampled (Gordon & De Silva, 1980). Gordon et al. studied the effects of otter trawling on benthic habitat and communities on Western Bank. Although not specific to this UoC, results indicated very limited immediate impacts on the benthic community. The structure of the colonial epifaunal assemblage was not affected by repeated trawling over three years. However, the total biomass of colonial epifauna was significantly reduced. The team considers that due to the healthy status of the nephrops and the low abundance of predators it is highly unlikely that biodiversity, community structure and productivity are adversely impacted by this fishery. The high discard rate prevents the fishery from achieving a SG100, as, even though it seems to be a high abundance of dab no reference points have been defined yet for this and other species.		
References		» Björnsson, B. and Dongala Dombaxeb, M.A. ICES Journal of Marine Science. (2004) 61 (6):983-991. Quality of Nephrops as food for Atlantic cod (*Gadus morhua* L.) with possible implications for fisheries management. http://icesjms.oxfordjournals.org/content/61/6/983.abstract » Gordon, J.D.M. and de Silva, S.S. (1980). The fish populations of the West of Scotland Shelf. Part I, Oceanographic Marine Biology Annual Review, 18, 317-366		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
	» Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication. » http://www.marlin.ac.uk/biotic/browse.php?sp=4390 » Parslow-Williams P., Goodheir C., Atkinson R.J.A., Taylor A.C. Feeding energetics of the Norway lobster, *Nephrops norvegicus* in the Firth of Clyde, Scotland. Ophelia2002; 56:101-120. http://cel.webofknowledge.com/InboundService.do?SID=U2IdkSsNrYtswp8HOi8&product=CEL&UT=000178458400004&SrcApp=Highwire&Init=Yes&action=retrieve&Func=Frame&customersID=Highwire&SrcAuth=Highwire&IsProductCode=Yes&mode=FullRecord
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.2

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	Y
	Justification	The team considers that there is a strategy to protect the Kattegat ecosystem, focused in the recovery of the cod stock. Measures in place, such as the closed areas, the cod recovery plan, the enforcement effort, the collaboration between the Swedish and Danish fisheries agencies, the establishment of Natura 2000 sites, the quota assigned, and the use of selective gears can be seen as a planned strategy.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	EU fisheries should address the precautionary and ecosystem approach in their management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help co-ordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE). Furthermore legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations and Norway-EU agreements. It is therefore assessed that there are a series of measures in place that constitute a strategy to address impacts on the ecosystem. But this strategy is highly focused on the recovery of cod and does not pay the same attention to other impacts. Therefore, SG100 is not met.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	The team considers that this combination of spatial and fishery-specific management is likely to work in relation to achieving or maintaining ecosystem integrity. Nevertheless, more measures should be implemented to assess impacts in other zones of the Kattegat apart from the closed areas.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N
	Justification	The designation of closed areas, Natura 2000 sites, effort control, and management of fisheries, inspections on board and aerial surveillance suggests that the strategy is implemented in the closed areas, but not in the whole Kattegat Sea.		
References		» DTU Aqua, 2013. Evaluation of Cod avoidance measures for Kattegat » Evaluation of closed areas in Kattegat to promote the rebuilding of cod stock https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf » ICES CM 2009 ACOM Advisory Committee: 20 Report of the Working Group on the Assessment on Ecosystem Effects of Fishing Activities. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WGECO/wgeco_final_2009.pdf » ICES. 2002. Report of the Working Group on Ecosystem Effects of Fisheries. Advisory Committee on Ecosystems.		

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

Evaluation Table for PI 2.5.3

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	Kattegat ecosystem has been studied by different institutions over the years. There is relevant information to understand the key elements of the ecosystem and its functions. These key elements include the trophic structure of the Kattegat ecosystem, such as prey, predators and competitors, community composition, productivity patterns and biodiversity characteristics. ICES reports on stocks assessment also provide relevant information to know the status of the different components of the fishery. For this reason, the team considers that the information is adequate to broadly understand the key elements of the fishery.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Main impacts of the fishery on these key elements can be inferred from existing information, such as the Mackinson & Daskalov (2007) Ecopath model of the North Sea (which includes the Kattegat). This model is able to answer questions such as the response of the ecosystem to changes, and can be used as a basis in the design of policies aimed to implement ecosystem management principles, and can provide testable insights into changes that have occurred in the ecosystem over time.		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	Nephrops is a low trophic species and its relationship with other species is known. The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known. Direct and indirect impacts of the fishery on both ETP species and seabed habitats are known with a reasonable degree of accuracy.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred. The poor data from on records from some sections are corrected by the good records of the Danish fisheries fishing in the same area. These data are sufficient to allow the main impacts on these components to be inferred directly.		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	N
	Justification	Sufficient data continue to be collected through various organizations. Data are routinely collected on an ongoing basis to allow for the detection of any change or increase in risk level to the main ecosystem components. But an advice on mixed fisheries in the Kattegat would provide information sufficient to support the development of strategies to manage ecosystem impacts.		
References		» Annual report for the Swedish National Programme for collection of fisheries data 2012. Swedish Agency for Marine and Water Management. https://www.havochvatten.se/download/18.2a9b232013c3e8ee03e7a3f/1364904967368/Sweden_NP_Proposal_2011-2013_Text_26-Mar-2013.pdf » Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp. http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Principle 2

UoC 3 Skagerrak Trawl Seltra

Evaluation Table for PI 2.1.1

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?			N

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species

Justification

According to STECF 2012 data on landings and bycatch (see Table 7), the main retained species that will be considered are cod, haddock, saithe, plaice and witch. As this gear was introduced in the Skagerrak Sea in February 2013 there are still no real data on catch composition. In a precautionary proxy the team will consider data from the previous trawling gear in the same sea.

STECF 2012 data. Danish trawling gear. Skagerrak Sea.

Main retained Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total catch
Nephrops	1494,456	21,06	911,495	37,9	2405,951	22,79
Cod	1020,995	14,39	1120,815	52,3	2141,81	20,28
Haddock	815,534	11,49	507,914	38,4	1323,448	12,53
Saithe	1238,848	17,46	40,235	3,1	1279,083	12,11
Plaice	839,763	11,83	120,455	12,5	960,218	9,09
Witch	749,98	10,57	165,687	18,1	915,667	8,67
Total main retained species	6159,576	86,80	2866,60	N/A	9026,177	85,48
TOTAL (All retained spp)	**7095,959**	**100**	**3463,322**	**N/A**	**10559,281**	**100**

Landings data show that this is a mixed fishery with a high rate of retained species, where main retained species comprise 85% of the total catch, but there are 24 other minor retained species which add up to 100% of the total catch.

ICES 2013 advice for cod in the North Sea shows that the species has reached a gradual improvement in the status of the stock over the last few years in the Skagerrak and is now in the vicinity of Blim, but target reference points are not reached yet (SG60 not met).

ICES 2013 advice for haddock in Division IIIa report that in recent years F has been around FSMY and SSB has been above MSY Btrigger. (SG100).

ICES 2013 advice for saithe in Division IIIa report that F has fluctuated around FSMY in recent years but in 2012 SSB was just below MSY Btrigger (SG80).

Plaice in Skagerrak is closely associated with plaice in the North Sea and is included in the North Sea plaice stock assessment, although local components are present in the area (ICES, 2013). In the Western component, plaice would be a mixture of local components intermingling with the North Sea stock. In the Eastern component, adult plaice would be only constituted of local components although nursery grounds would also host North Sea juveniles. This means that the management harvest control rules should take local components into account. For the Western component (where nearly all catches take place) the biomass in the last three years (2011–2013) is 7% higher than the average of the five previous years (2006–2010). (Eastern Skagerrak plaice SG80. Eastern component is considered under SGc). Witch is also considered under SGc.

Western plaice, haddock and saithe are considered to be within biologically based limits, so they meet SG80a other than cod, Eastern plaice and witch are considered under SG80c.

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	There are not defined target reference points for witch. There are other minor retained species whose target reference points are not always defined.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The team considers that there is a strategy in place that should ensure that the fishery does not hinder the recovery of the cod stock. Cod is subject to an EU recovery plan (CR 1342/2008) with effort restrictions enforced through a reduction in kW-days in direct proportion to reductions in fishing mortality and quota restrictions. There are also controls on landings and gear restrictions. This recovery plan has proven to be effective in the Skagerrak Sea, as the status of the cod stock has gradually improved over the last few years and SSB is now in the vicinity of Blim. (SG80 for cod). Eastern Skagerrak plaice biomass is considered depleted. The biomass in the Eastern Skagerrak for the last three years (2011– 2013) is 19% lower than the average of the five previous years (2006–2010). Catches in the Eastern area are very low (under 1% of the Skagerrak catches in 2012), but the actual exploitation rate is uncertain due to the reduced stock status. ICES 2013 advice for witch reports that landings have declined in the last decade, but 2012 landings in IIIa show an increase. Abundance indices show a declining trend since the peak observed in 2000 and an increase in recent years. The stock size indicator (number/hour) in the last 3 years (2011-2013) is more than 20% higher than the average of the five previous years (2006-2010) for both surveys. Exploratory estimates suggest that fishing mortality is above potential FMSY proxies (SG80). Cod recovery plan and other management measures are considered as a partial strategy that will help in the recovery of these stocks. (SG80 for Eastern plaice and witch).		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of most species is well known. Besides that, there are practices in place such as quotas and MLS that should ensure that the fishery does not hinder the recovery of stocks of the retained species.		
References		» ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » ICES June 2013. Advice for mixed fisheries in Division IIIa North (Skagerrak). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf » ICES 2013 Advice for haddock. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/had-34.pdf » ICES 2013 Advice for plaice. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf » ICES 2013 Advice for saithe. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/sai-3a46.pdf » ICES 2013 Advice for witch. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/wit-nsea.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 2.1.2

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	N
	Justification			

Species	SG60	SG80	SG100
Cod	Y	Y	Y
Haddock	Y	Y	Y
Saithe	Y	Y	Y
Plaice	Y	Y	N
Witch	Y	Y	N
Other minor retained species	N/A	N/A	N

The long term management plans for cod, haddock or saithe support these species reaching the SG100. These plans can also be seen as a partial strategy to minimize the likelihood of the fishery hindering the recovery of other retained species, such as plaice and witch. Catches of plaice in the Eastern area are very low (under 1% of the Skagerrak catches in 2012), and for witch, stock size indicator for the last 3 years shows an increase respect to the average of the previous 5 years.

Nonetheless, these plans are not sufficient to prevent the risk of serious or irreversible harm in all retained species (24 different species), as many of them are still not very well documented (i.e. lumpfish).

b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
	Justification			

Species	SG60	SG80	SG100
Cod	Y	Y	Y
Haddock	Y	Y	Y
Saithe	Y	Y	N
Plaice	Y	Y	N
Witch	Y	Y	N
Other minor retained species	N/A	N/A	N

The improvement of different stocks in the Skagerrak gives confidence in the effectiveness of these LTMP for cod, haddock and saithe. SSB of saithe is currently below Bpa and, this gear is not very effective at reducing bycatch of flatfish, so saithe does not meet the SG100. The gear is similarly ineffective at reducing bycatch of plaice and witch, but the abundance of both species is increasing, which gives confidence to the function of these partial strategies.

c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification			

Species	SG60	SG80	SG100
Cod	N/A	Y	Y
Haddock	N/A	Y	Y
Saithe	N/A	Y	Y
Plaice	N/A	Y	N
Witch	N/A	Y	N
Other minor retained species	N/A	N/A	N

The cod recovery plan has been in place since 2008 under CR 1342/2008. It is considered that it is successfully implemented, and it is sufficient for helping the recovery of cod and some other species. EU-Norway agreements on the Long Term Management Plans for haddock and saithe are also implemented successfully.

But the lack of a specific management plan for plaice, witch or other species makes it difficult to assert that a complete strategy is successfully implemented.

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Cod and haddock LTMPs could be considered to be achieving their objective in the Skagerrak Sea, as populations are increasing. However, Spawning Stock Biomass of cod is just around the limit reference point and Fishing mortality is still above the recommended level. As there are 24 retained species it is difficult to assert that the partial strategy is achieving the objectives for all of them, as not all of them are increasing their populations or at least maintaining them in a good stock status.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » EU – Norway Long Term Management Plan for haddock. http://www.nwwrac.org/admin/publication/upload/LTMP_North_Sea_Haddock_MSE_CN_EN.pdf » EU – Norway Long Term Management Plan for saithe. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:DKEY=728986:EN:NOT » ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » ICES 2013. Advice for mixed fisheries in Division IIIa North (Skagerrak). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf » ICES 2013 Advice for plaice. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf		

PI 2.1.2	**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**
	» ICES 2013 Advice for witch. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/wit-nsea.pdf » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.3

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification			

Species	SG60	SG80	SG100
Cod	N/A	Y	Y
Haddock	N/A	Y	Y
Saithe	N/A	Y	Y
Plaice	N/A	Y	Y
Witch	N/A	Y	N
Other minor retained species	N/A	N/A	N

The team considers that the information from logbooks, landings data, fishery auctions and observers provides a range of qualitative and quantitative information, but the lack of information on the consequences for the status of the stocks, due to the short history of this fishery (which began in 2013) precludes it from meeting the SG100.

Poor stock status information on witch justifies a SG80. All other minor retained species don´t reach a SG100 as the status of all of them is not well known.

b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
	Justification			

Species	SG60	SG80	SG100
Cod	Y	Y	N
Haddock	Y	Y	N
Saithe	Y	Y	N
Plaice	Y	Y	N
Witch	Y	Y	N
Other minor retained species	N/A	N/A	N

All main species reach a SG80, as outcome stock status can be estimated for most of them (but these are not yet estimated for plaice and witch). The lack of a high degree of confidence in these quantitative estimations prevents them from achieving a SG100.

c	Guidepost	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	The team considers that information is adequate to support a partial strategy, but considers that is not enough to support a strategy to manage all retained species, as there´s still a lack of data on some other species. The team considers that information provided by ICES advices is adequate to support a partial strategy, as the cod recovery plan and the different LTMP can be seen, but as there is no directed strategy for most retained species it is not possible to evaluate and rationalize if the partial strategy is achieving its overall objective.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	N

PI 2.1.3	Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
Justification	

Species	SG60	SG80	SG100
Cod	N/A	Y	Y
Haddock	N/A	Y	Y
Saithe	N/A	Y	Y
Plaice	N/A	Y	Y
Witch	N/A	Y	N
Other minor retained species	N/A	N/A	N

Data on retained species are being collected by SWAMN and SLU. The team considers that it is difficult to assess ongoing mortalities to all retained species.

References

» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF

» ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf

» ICES June 2013. Advice for mixed fisheries in Division IIIa North (Skagerrak). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf

» ICES 2013 Advice for plaice. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-skag.pdf

» ICES 2013 Advice for witch. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/wit-nsea.pdf

» ORCA-EU, The Fisheries Secretariat (FiSH) (2007). A report on IUU fishing of Baltic Sea. http://www.fishsec.org/downloads/1198235739_21059.pdf

» Ziegler, F. SIK report 746. Environmental Life Cycle Assessment of Norway lobster (Nephrops norvegicus) caught along the Swedish west coast by creels, conventional trawls and species-selective trawls. A data report. http://www.sik.se/archive/pdf-filer-katalog/SR746(1).pdf

OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	N/A

Evaluation Table for PI 2.2.1

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	N/A	N/A	N
	Justification	There are no main bycatch species to consider in this UoC. Even though there is bycatch in this fishery, most species are retained to a greater or lesser extent. According to STECF 2012 data on landings and bycatch (see Table 7), only 3 species are generally discarded, but their weight represents less than 2% of the total catch composition.		

2012 data. Danish trawling gear. SKAGERRAK SEA.

FAO Code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
PLA	**American Plaice**	0,036	0,0005	178,869	99,97	178,905	1,6943
HER	**Herring**	0,104	0,0015	12,049	99,1	12,153	0,1151
CMO	**Rabbitfish**	0,018	0,0003	4,241	99,6	4,259	0,0403
TOTAL 3 spp		0,158	0,0022	195,159	N/A	195,317	2
TOTAL all spp		7095,959	100	3463,322	N/A	10559,281	100

None of these species meets the SG100, as herring stock status situation is poor, and there is no information on the status of rabbitfish and American plaice in this area.

The fishery also reported 2 tonnes of spurdog caught during 2012. Spurdog is seriously depleted in the OSPAR Area and the stock may be in danger of collapse as a result of unsustainable removal in former target fisheries. While most target fisheries for spurdog collapsed over the past decade, its aggregating habit made this sensitive species highly vulnerable to localized, seasonal fisheries. Until recent years, retention of by-catch from mixed fisheries has also been unrestricted. Stock assessments for spurdog in the North-East Atlantic estimated very low stock status for this onetime highly abundant species. Continued target fishing and retention of bycatch since the above stock assessments are likely to have reduced the stock further and the North-East Atlantic population is presently listed as Critically Endangered in the IUCN Red List (Fordham et al. 2006). Recovery requires fishing pressure on this stock to be minimized. As the 2 tonnes caught represent a very small proportion of the total catch, SGa80 is still met.

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
b	Guidepost	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	There are no species to consider under the main bycatch species definition.		
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The team considers that as there are no main bycatch species and there is a very low proportion of bycatch species (3% of total catch), SG60 is met.		
References		» ICES advise for herring in Division IIIa. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf » OSPAR Commission 2010. Background Document for Spurdog or Spiny dogfish Squalus acanthias. http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.2

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	As there are no main bycatch species to consider, SG80 is met. Regarding all bycatch species (herring, American plaice and rabbitfish), they only represent 2% of the total catch. Spurdog represents less than 0.1 % of the total catch. The team considers that, on the contrary that with the grid gear, it can´t now be stated that there´s a strategy for minimizing bycatch. This UoC represents a mixed fishery and the seltra gear is not intended to avoid the catch of other species, but to specifically facilitate the escape of roundfish such as cod. Bycatch proportions are still considerable.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.

DK seltra. SKA. 2012	
Total catch (Tonnes)	10559,281
Total landings (Tonnes)	7095,959
Total discards (Tonnes)	3463,322
% Discards	**32,79**
% Landings	67,20

Species	SG60	SG80	SG100
Main bycatch species	N/A	N/A	N
Other minor retained species	N/A	N/A	N

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
	Met?	Y	Y	N
	Justification			

Species	SG60	SG80	SG100
Main bycatch species	N/A	N/A	N/A
Other minor retained species	N/A	N/A	N

All these LTMP, along with MLS, fishing effort control and quota regulations can be seen as a partial strategy that is working in the avoidance of bycatch. Besides that there are no main bycatch species to consider in this UoC. A lower discard ratio would support a SG100.

c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The cod recovery plan, the effort control, the use of the seltra gear are successfully implemented in the area, but they are only considered as a partial strategy as the seltra gear does not intend to stop the catch of other species apart from nephrops.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Even though there is some improvement in the status of certain species, it can´t be said that this partial strategy for avoiding bycatch its achieving its overall objective, as the seltra gear is not very selective in the avoidance of flatfish.		

References

- Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF
- http://www.fishonline.org/fish/dab-96
- http://www.fishonline.org/fish/flounder-98
- Fiskeriverket. Measures to allow more accurate estimates of fisheries bycatch and their effect on endangered species and stocks. 2007-06-29

PI 2.2.2	**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.3

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	It is known that SLU and SwANM in Sweden and DTU Aqua and the AgriFish Agency in Denmark have been recording data on bycatch on a continuous basis. As the gear has just been implemented, there aren´t yet any reports on this UoC to work with, which does not mean that those data and information don´t exist. It can also be inferred that data on bycatch will also be published in STECF in 2015, as right now data from 2012 are already published. Reports from previous years and from other gears can give an idea of the amount of bycatch expected, which will always be smaller than in previous years, because of the bigger mesh size in the escape window in the sorting box section. For this reason the team considers that there is qualitative information and also some quantitative information on the amount of main bycatch species expected in the fishery. The poor knowledge of the status of the rabbitfish prevent the fishery from SG100.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	As mentioned before, there isn´t any direct information yet on the bycatch of this UoC. The team considers that there is not enough information to quantitatively estimate outcome status with a high degree of certainty for species such as rabbitfish or American plaice.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
	Justification	The team considers that it is difficult to evaluate with a high degree of certainty whether the strategy is achieving its objective of adequately managing all bycatch species.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	Y
	Justification	Data on bycatch is being collected by DTU Aqua and SLU observers in Denmark and Sweden. The collection of these data is very thorough and all information is open to the general public and can be downloaded at the STECF website.		
References		» Hornborg, S. et al. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated using a life cycle approach. Marine Policy (2012) Figure 4, Page 5. http://www.sciencedirect.com/science/article/pii/S0308597X12000346 » Swedish Government commission L2013/1017/JFS. Government Commission on Monitoring ban discards in Skagerrak. Regeringsuppdrag om kontroll av förbud mot utkast av fisk i Skagerrak. 31/05/2013. https://www.havochvatten.se/download/18.3f5692b613e6622a2eb135a/1369980528925/Regeringsuppdrag+om+kontroll+av+utkastf%C3%B6rbud+i+Skagerrak+L2013_1017_JFS.pdf		

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

Evaluation Table for PI 2.3.1

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	N
	Justification	Endangered, Threatened and Protected species are those that are recognized by binding international agreement (e.g. CITES) or legislation (CR 43/2014) As the gear is just implemented in Sweden, the team will study data on endangered species recorded by the Danish client (see Table 26). Among other species not considered ETP species under the MSC standards, records show the following catches for 2012. **Live weight (kilos) of ETP species in the Danish trawl fishery in the Skagerrak. 2011.**		

Species	SKAGERRAK	
	Individuals	Kg
Shark ssp	4	5
Coral	1	15
Unknown shark	2	2,5
Skate	1	2

Records don't show any entanglement of harbor porpoise or other marine mammals. It is highly unlikely that marine mammals and cetaceans interact with this fishery. Northridge (1988) provided several reasons why this species normally avoids the catch on demersal gears.

The team considers that the effects of this fishery are highly likely to be within limits on national and international requirements for the protection of ETP Species. Uncertainties in the identification of all sharks and skates prevent the fishery from achieving a SG100.

b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N
	Justification	After the site visit, the team concludes that directed fisheries are highly unlikely to create unacceptable impacts on ETP species listed in section 3.4.3. Landing ban prohibits the retaining on board of common skate, which is returned to the water. If this return is done quickly there´s a high probability for these species to survive, as different studies show. (Mandelman and Farrington 2007, Revill *et al*.2005, Enever *et al* 2009, Enever *et al*. 2010)		

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N
	Justification	Indirect effects of the fishery such as habitat destruction, destruction of egg cases or competition for forage effects have been considered 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.		
References		» Council Regulation (EU) No 43/2014, fixing for 2014 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in EU waters and, for EU vessels, in certain non-EU waters. » Enever, R., Catchpole, T.L, Ellis, J.R. and Grant, A. 2009. The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research, Volume 97, Issues 1-2, April 2009, Pages 72-76 http://www.sciencedirect.com/science/article/pii/S0165783609000046 » Enever, R. Revill, A. Caslake, R. and Grant, A. 2010. Discard mitigation increases skate survival in the Bristol Channel. Fisheries Research, Volume 102, Issues 1-2, February 2010, Pages 9-15. http://www.sciencedirect.com/science/article/pii/S0165783609002598 Northridge, S. An updated world review of interactions between marine mammals and fisheries. FAO fisheries technical paper, 251. http://www.fao.org/docrep/003/t0452e/t0452e00.htm		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.2

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimize mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y

	Justification	There are measures that are designed to manage impacts of commercial fisheries on ETP species specifically. There is also regulatory protection of ETP species and records on the ETP species caught. There are Action Plans for Threatened Species of Fish and Shell (Finfo 2007:7). All these measures are considered to constitute a comprehensive strategy to manage ETP species. These measures include: a) Annual EU fishing opportunities regulations. 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. These species 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. b) 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 set out limits for fishing effort by mobile gears according to mesh size used (TR1, TR2) c) 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*." d) 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. e) 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.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with	There is an objective basis for confidence that the strategy will work, based on information directly	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
		similar fisheries/species).	about the fishery and/or the species involved.	
	Met?	Y	Y	Y
	Justification	The team concludes that there is an objective basis for confidence that the strategy will work, as there is a high number of measures, a strict effort control, and a code of conduct establishing steps to take in the event of interactions with ETP species. ETP species in the area have been sampled in Sweden since 2005. For all the above reasons, the team concludes there is a high confidence that the strategy will work.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	Finfo 2007:7 action plan is implemented since 2007, but the team could not ascertain if all elements of the strategy were fully implemented. The lack of direct data from this fishery makes it difficult to check if all the elements of the strategy are successfully implemented.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	The team hasn´t found evidence of the absence of landings for these species and there are still remaining doubts about the correct identification of all ETP species.		
References		» ASCOBANS (2004). Annual national reports submitted to the Secretariat as of 27 April 2004 (Belgium, Germany, Sweden, and UK). Document AC11/Doc. 30(S) presented at the 11th Advisory Committee meeting to ASCOBANS, Jastrzebia Góra, Poland, 27 – 29 April, 2004. http://www.ascobans.org/pdf/ac11/ac11-30.pdf » Fiskeriverter Informerar Finfo2007:7. Atgardsprogram for hotade fiskarter och skaldjur.		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
	https://www.havochvatten.se/download/18.64f5b3211343cffddb2800018319/1348912834692/finfo2007_7.pdf » ICES (2010) Report of the study group on Bycatch of Protected Species (SGBYC).ICES ADVISORY COMMITTEE. ICES CM 2010/ACOM:25 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/SGBYC/sgbyc_final_2010.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.3

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The Swedish seltra shall be considered as selective as the Danish seltra gear. The Danish fishery has provided records on ETP catches. This information should be sufficient to quantitatively estimate the impact of the fishing for these species, but not enough to quantitatively estimate outcome status of ETP species.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	SLU observer programs and STECF data reports are considered to be adequate to support ongoing monitoring of the fishery's impacts on these species as well as measuring trends, while also to effectively support a strategy to manage impacts. This should be sufficient to determine whether the fishery may be a threat to the protection and recovery of these species. SG 100 can´t be met as the information is not enough to know the magnitude of all impacts and injuries caused to ETP species.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	The team considers that the volume of data provided by ongoing monitoring programs on ETP species is adequate to support measures to manage the impacts on these species, notwithstanding these trends have not yet been measured due to the short record history. Yet, the complete information that is collected should be enough to do so in a short time.
References		» OSPAR 2010. Background Document for Common skate *Dipturus batis*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	The team considers that with Nephrops fisheries targeting softer mud or sandy mud sediment it is highly unlikely that trawling activity would cause irreversible harm. According to Trimmer *et al* (2005) biogeological processes in the upper layers of sediment, both oxic and anoxic, seem unaffected by trawling in the long term. Benthic trawling can alter the organic structure of sediments through a combination of the removal of surficial sediments and the turnover and burial of organic matter (Mayer *et al*. 1991, Watling *et al.* 2001, as cited in Trimmer *et a*l 2005). Jennings *et al.* (2002) showed that the small infauna community (largely polycheates) is unaffected by trawling activity. Since small infaunal polychaetes are a key source of food for flatfishes, the research concluded that beam trawling disturbance does not have a positive or negative effect on their food supply. It is however accepted that trawl gear does impact habitats.Fishing strategy includes the fishing of one vessel after another on the same area, which would reduce the area where these impacts may take place. Fishing intensity of the Swedish fisheries for lobster, cod and other benthic fish were studied in the Kattegat (area of study: 21.000 km2) for the period 2001-2003 (Gislason, page 62. 2013). Nilsson & Zieger (2007) found that more than 44% of the seabed was being fished. The study showed that 55% of hard bottom and 41% of mud bottom was trawled more than twice a year. The study did not include the Danish fishing, and the effects on bottom organisms were not investigated.		
References		» Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. http://icesjms.oxfordjournals.org/content/60/2/371.full » Gislason, H. et al. 2013. Miljøskånsomhed og økologisk bæredygtighed i dansk fiskeri. DTU 2013. Journal nr 12/09478 (Sustainability and ecology of Danish fisheries) » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235 » Humborstad, O.-B., Nøttestad, L., Løkkeborg, S., and Rapp, H. T. 2004. RoxAnn bottom classification system, sidescan sonar and video-sledge: spatial resolution and their use in assessing trawling impacts. ICES Journal of Marine Science 61, 53-63. http://icesjms.oxfordjournals.org/content/61/1/53.full.pdf		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	» 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Jennings S, Nicholson MD, Dinmore TA, Lancaster JE (2002) Effects of chronic trawling disturbance on the production of infaunal communities. Mar Ecol Prog Ser 243:251–260 http://www.int-res.com/articles/meps2002/243/m243p251.pdf » M. J. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. (page 12) file:///C:/Users/Luc%C3%ADa/Desktop/KAiser%20et%20al%202006%20habitat%20nephrops.pdf » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » OCEANA. Conservation proposals for ecologically important areas in the Baltic Sea. 2011. http://oceana.org/en/eu/media-reports/publications/baltic-conservation-proposals-for-ecologically-important-areas-in-the-baltic-sea » Pommer, C.D., “Does bottom trawling fishery have an impact on the benthis fauna in the Kattegat?” http://researchonline.jcu.edu.au/21463/3/21463_Stieglitz_and_Ridd_2011.pdf » 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. http://www.int-res.com/abstracts/meps/v298/p79-94/
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.2

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Most of the fishing effort takes place over soft seabed sediments such as mud and sandy mud, and the effort area is identified by the Vessel Monitoring Systems. Skagerrak is a studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). There are also different proposals for conservation sites by NGO´s. These Marine Protected Areas are protected from trawling due to the general trawl boundary, and the regulation to protect reefs inside this boundary. The Bratten area is protected and there are current meetings about the future zoning boundaries to protect sensitive habitats from trawling. The establishment in 2009 of the Kosterhavet National Park as the first marine national park shows an improvement in the management of marine habitats types. Therefore, the team considers that there is a strategy in place for managing the impact of the fishery on habitat types.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	N	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Justification	As long as management measures are not designed and implemented there won´t be an objective basis for confidence that this strategy will work, as at present the strategy is limit to specifying areas which should need more protection but aren´t regulated yet. Management measures need to be implemented in these areas, and should include the ability to modify fishing practices in the light of monitoring results, in order to achieve a confidence in the strategy effectiveness. There are a large number of Natura2000 sites in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden: Varedofjorden, Store Rev, Lonstrup Rodgrund, Gule Rev, Gullmarsfjorden and Herthas flak). As shown in VMS, Skagens Gren area supports a high fishing effort which impacts the seafloor. This area is a Natura 2000 site designated to protect birds and mammals. The regulation of these areas is therefore needed. Until management measures are designed and implemented there is no objective basis for confidence that this strategy will work, as at present the strategy is limited to specifying Natura sites which should need more protection but aren´t regulated yet. Management measures need to be implemented in these areas in order to achieve a confidence in the strategy effectiveness.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The establishment of these protected areas is considered as evidence of the success of the implementation of this strategy, but management measures should be clearly specified. There are a large number of Natura2000 sites in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden: Varedofjorden, Store Rev, Lonstrup Rodgrund, Gule Rev, Gullmarsfjorden and Herthas flak), but, even though the need for fishing regulation in these areas is known, this regulation is not yet implemented.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			N
	Justification	The team considers this strategy hasn´t provided evidence yet of achieving its objective.		
References		» Board of Fisheries regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea https://www.havochvatten.se/miljopolitik-och-lagar/lagstiftning/svensk-lagstiftning/havs--och-vattenmyndighetens-forfattningssamling/register/fiskeriverkets-foreskrifter-fifs-200436-om-fiske-i-skagerrak-kattegatt-och-ostersjon.html		

PI 2.4.2	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
	» Council Regulation 1342/2008. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Fish and benthic environment at the Swedish west coast, 2004-2009: Effects of jet boundary relocation and other fishing regulations. Fiskeriverter informerar. F-info 2011:6 https://www.havochvatten.se/download/18.64f5b3211343cffddb2800012608/1348912838177/finfo2011_6.pdf » http://natura2000.eea.europa.eu/# » http://www.naturstyrelsen.dk/Naturbeskyttelse/Natura2000/Natura_2000_planer/Se_Planerne/001_125/ » http://projektwebbar.lansstyrelsen.se/kosterhavet/Sv/Pages/default.aspx
OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**3**

Evaluation Table for PI 2.4.3

PI 2.4.3		**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	N
	Justification	This area has been very well studied over the years and there are numerous studies on the distribution of all main habitats types. But the fact that new areas are still proposed as Marine Protected Areas and some of them have just received such consideration (as the coral reefs in the Bratten area, which was declared protected area just in 2011) makes it difficult for the team to assert that all vulnerable habitat types are known.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	Trawling activity generates disturbance on muddy and sandy sediments, as they are suspended in the water column and relocated again. Effects such as bottom damage, seabed relief, sediment sorting and species survival, abundance and recovery have been studied in different research programmes. The team considers that there is enough information to identify the nature of the impacts and the spatial and temporal extent of the interaction.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	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 these data are available for assessing the scale of risk to habitat on an ongoing basis. 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. The Danish NOVANA Programme is responsible for monitoring habitat distributions and characteristics. There is also a great involvement of different NGO´s in the study of these habitats.
References		» Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic populations caused by trawl fisheries on the Dutch continental shelf in the North Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331. http://icesjms.oxfordjournals.org/content/57/5/1321.abstract » Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L., and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. http://icesjms.oxfordjournals.org/content/60/2/371.full » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235 » ICES WGMHM REPORT 2009: Report of the Working Group on Marine Habitat Mapping. http://www.aquabiota.se/publikationersveng/pdf/wgmhm09.pdf » 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. http://icesjms.oxfordjournals.org/content/55/3/353.full.pdf » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » Løkkeborg, S. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO Fisheries technical paper 472. 2005 http://www.fao.org/docrep/008/y7135e/y7135e00.htm » NOVANA Programme: National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment. http://www.naturstyrelsen.dk/Naturbeskyttelse/National_naturbeskyttelse/Overvaagning_af_vand_og_natur/NOVANA+Program/

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

Evaluation Table for PI 2.5.1

PI 2.5.1		**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	N
	Justification	Nephrops is a low trophic level specie and is common prey for numerous marine species. There is a temporal coincidence in the decline of other species and nephrops abundance, which suggests a relationship between them. Nephrops main diet consists of crustaceans, molluscs, and to a lesser extent polychaetes and echinoderms (Parslow-Williams *et al*., 2002). Differences in diet appear to be due more to changes in prey abundance than to prey preference (Parslow-Williams *et al.*, 2002) indicating that the species is an opportunistic predator. *Nephrops* is preyed upon by different species some of which are listed below: » Research in Scotland showed that 80% of cod had Nephrops norvegicus amongst their stomach contents (Thomas, 1965b). Cod is by far the main predator of the Icelandic Nephrops stock (Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication) » Nephrops was also found in 52% of the thornback ray Raja clavata that were sampled (Thomas 1965b). » In the Clyde, Nephrops was found in 51% of the small spotted catshark (dogfish) *Scyliorhinus canicula* that were sampled (Gordon & De Silva, 1980). Gordon et al. studied the effects of otter trawling on benthic habitat and communities on Western Bank. Although not specific to this UoC, results indicated very limited immediate impacts on the benthic community. The structure of the colonial epifaunal assemblage was not affected by repeated trawling over three years. However, the total biomass of colonial epifauna was significantly reduced. The team considers that due to the healthy status of the nephrops and the low abundance of predators it is highly unlikely that biodiversity, community structure and productivity are adversely impacted by this fishery.		
References		» Björnsson, B. and Dongala Dombaxeb, M.A. ICES Journal of Marine Science. (2004) 61 (6):983-991. Quality of Nephrops as food for Atlantic cod (*Gadus morhua* L.) with possible implications for fisheries management. http://icesjms.oxfordjournals.org/content/61/6/983.abstract » Gordon, J.D.M. and de Silva, S.S. (1980). The fish populations of the West of Scotland Shelf. Part I, Oceanographic Marine Biology Annual Review, 18, 317-366		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
	» Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication. » http://www.marlin.ac.uk/biotic/browse.php?sp=4390 » Parslow-Williams P., Goodheir C., Atkinson R.J.A., Taylor A.C. Feeding energetics of the Norway lobster, *Nephrops norvegicus* in the Firth of Clyde, Scotland. Ophelia2002; 56:101-120. http://cel.webofknowledge.com/InboundService.do?SID=U2IdkSsNrYtswp8HOi8&product=CEL&UT=000178458400004&SrcApp=Highwire&Init=Yes&action=retrieve&Func=Frame&customersID=Highwire&SrcAuth=Highwire&IsProductCode=Yes&mode=FullRecord
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.2

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	The team considers that there are measures in place, such as the cod recovery plan, the establishment of Natura 2000 sites, the quota assigned, and the use of selective gears. The joint application of these measures can be considered as a partial strategy, but this falls short of a full ecosystem plan for the area.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	EU fisheries should address the precautionary and ecosystem approach in their management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help co-ordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE). Furthermore, legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations and Norway-EU agreements. It is therefore assessed that there are a series of measures in place that constitute a partial strategy to ensure the impacts of the gear on the ecosystem achieve Ecosystem Outcome SG80.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	The team considers that this combination of spatial and fishery-specific management is likely to work in relation to achieving or maintaining ecosystem integrity.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N
	Justification	The designation of Natura 2000 sites, effort control, management of the fishery, the inspections on board and on landing ports suggests that this partial strategy is being implemented successfully.		
References		» ICES CM 2009 ACOM Advisory Committee: 20 Report of the Working Group on the Assessment on Ecosystem Effects of Fishing Activities. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WGECO/wgeco_final_2009.pdf » ICES. 2002. Report of the Working Group on Ecosystem Effects of Fisheries. Advisory Committee on Ecosystems		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.3

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	Skagerrak Sea fisheries have been studied by different institutions over the years. There is relevant information to understand the key elements of the ecosystem and its functions. These key elements include the trophic structure of the Skagerrak ecosystem, such as prey, predators and competitors, community composition, productivity patterns and biodiversity characteristics. ICES reports on stocks assessment also provide relevant information to know the status of the different components of the fishery. For this reason, the team considers that the information is adequate to broadly understand the key elements of the fishery.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Main impacts of the fishery on these key elements can be inferred from existing information, such as the Mackinson & Daskalov (2007) Ecopath model of the North Sea. This model is able to answer questions such as the response of the ecosystem to changes, and can be used as a basis in the design of policies aimed at implementing ecosystem management principles, and can provide testable insights into changes that have occurred in the ecosystem over time.		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	Nephrops is a low trophic species and its relationship with other species is known. The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known. Direct and indirect impacts of the fishery on both ETP species and seabed habitats are known with a reasonable degree of accuracy.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred. These data are sufficient to allow the main impacts on these components to be inferred directly.		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	The team considers that information is sufficient to support the development of strategies to manage ecosystem impacts. Besides that, sufficient data continue to be collected through various organizations. 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. ICES Mixed fisheries advice report for the North Sea (2013) (which includes Skagerrak), gives an overview of the stocks of different species and marks a path towards ecosystem management. This advice indicates that sufficient data is collected to support the development of strategies to manage ecosystem impacts.		
References		» Annual report for the Swedish National Programme for collection of fisheries data 2012. Swedish Agency for Marine and Water Management. https://www.havochvatten.se/download/18.2a9b232013c3e8ee03e7a3f/1364904967368/Sweden_NP_Proposal_2011-2013_Text_26-Mar-2013.pdf » ICES Mixed fisheries advice for the North Sea (2013). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf		

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
	» Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp. http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	**N/A**

UoC 4: Kattegat SELTRA trawl

Evaluation Table for PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	N (see SG60c)	N (See SG80c)	N
	Justification			

According to STECF 2012 data on landings and bycatch (see Table 8) the main retained species that will be considered are dab, herring, plaice and cod. These data correspond to the Danish fleet fishing with the Seltra gear in the Kattegat Sea.

STECF 2012 data. Danish gear. KATTEGAT SEA

FAO code	Retained species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of catch discarded	Catch (Tonnes)	% of Total Catch
NEP	Nephrops	1350,869	74,92	1972,222	59,3	3323,091	46,93
DAB	**Dab**	31,667	1,76	1434,748	97,8	1466,415	20,71
HER	**Herring**	10,299	0,57	1025,905	99	1036,204	14,63
PLE	**Plaice**	136,954	7,60	313,589	69,6	450,543	6,36
COD	**Cod**	49,001	2,72	104,15	68	153,151	2,16
Total main retained species		1578,79	87,56	4850,614	N/A	6429,404	90,80
Total (All retained species)		**1803,002**	**100**	**5277,563**	**N/A**	**7080,565**	**100**

ICES Advice for Dab (2013) shows an increment of the abundance for the last 15 years in IIIa, but still there´s not enough information to give catch advice and no reference points have been defined. WG NEW (2013) suggests dab abundance is increasing, but no biologically based limits are set. The team has considered dab as a retained species due to the 31 Tonnes landed in 2012. SG80.

ICES 2013 advice for herring states that SSB has decreased in recent years, reaching the lowest in the time-series in 2011 at between BPA and Blim. Fishing mortality has been at its lowest in the recent years, but it is still above FMSY in 2012. The stock appears to remain in a low production period; however, recruitment is estimated with high uncertainty. SG60 is not met.

ICES Advice for Plaice (2013) in the Kattegat confirms that fishing mortality has dropped since 2006, and SSB has been increasing since 2009. The SSB in the last two years (2011–2012) is 76% higher than the average of the three previous years (2008–2010). Fishing mortality is below FMSY proxy. No specific management objectives are known to ICES. The stock is planned to be benchmarked in 2014. SG80.

ICES Advice 2013 for cod in Kattegat advises on the basis of precautionary considerations that there should be no directed fisheries and bycatch and discards should be minimized. SG60 is not met.

All the main retained species except for cod and herring are considered to be within biologically based limits, so all main species meet SG80a other than cod which is considered under SG80c.

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	Target reference points are well defined for cod, plaice and herring, but not for dab. Besides, there are other minor retained species whose target reference points are not always defined.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The team considers that there are measures to ensure that the fishery does not hinder the recovery of these species, and could also state that there is a strategy for species such as cod and herring.		

Species	SG60	SG80	N/A
Dab	N/A	N/A	N/A
Herring	Y	Y	N/A
Plaice	N/A	N/A	N/A
Cod	Y	Y	N/A

The team considers that there is a strategy in place that should ensure that the fishery does not hinder the recovery of cod or herring. Cod is under a recovery plan (CR 1342/2008) with effort and quota restrictions, and there is a proposal for an EU-Norway Long Term Management Plan for herring which should be applied in 2015.

The working group on the evaluation of closed areas concluded that “the increase in SSB estimated for 2012 compared to the values estimated for 2009 can partly be attributed to the measures related to the implementation of closed areas”

The quota restrictions, the effort control, gear restrictions and control of landings contribute to prove the effectiveness of these strategies.

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	ICES 2013 advice for dab considers dab as a limited data stock. It also states that dab discards are known to take place, but data are insufficient to estimate a discards proportion that could be applied to give catch advice. Regardless of this information, surveys show an increasing abundance of dab in Division IIIa, so it seems reasonable to conclude that dab is not outside biologically based limits, regardless of its high discard ratio. Status of herring, plaice and cod is well known.		
References		» ICES 2013 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » ICES May 2013. Advice for plaice in Subdivisions 21-23. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-2123_201304142222.pdf » ICES June 2013. Advice for herring in Division IIIa and Subdivisions 22-24. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/her-3a22.pdf » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf » ICES 2013 Advice for dab. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/dab-nsea.pdf » Summary evaluation of closed areas in Kattegat. WG NEW (2013). http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGNEW/WGNEW%20report%20160513.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.2

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	N
	Justification			

Species	SG60	SG80	SG100
Dab	Y	Y	N
Herring	Y	Y	Y
Plaice	Y	Y	N
Cod	Y	Y	Y
21 Minor retained species	N/A	N/A	N

Technical regulations on the gear, TACs, minimum landing sizes and the management measures related to the cod recovery plan are considered a partial strategy which prevents the fishery from hindering the recovery of the different species.

However, the seltra is considered a selective gear as it avoids the catch of round fish, but still catches a significant proportion of flatfish which is not always landed in a high proportion.

b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
	Justification	DTU Aqua Notat to Naturerhvervstyrelsen on the Evaluation of cod avoidance measures in the Kattegat suggests, according to ICES cod stock assessment report and Vinther and Eero paper, that the aim of the cod management plan to reduce fishing mortality of cod ages 3-5 has worked by the introduction of cod avoidance measures. And that even though the objective to rebuild SSB to above Bpa hasn´t been reached yet, an increase in SSB has been detected. It is also stated that the current level of F is highly likely to be less than the target F of 0.4. Species / SG60 / SG80 / SG100 Dab / Y / Y / N Herring / Y / Y / N Plaice / Y / Y / N Cod / Y / Y / Y 21 Minor retained species / N/A / N/A / N The team considers that there are measures such as gear regulations and effort control that should reduce harm on these species. These measures, as the effort control associated to the cod recovery plan, have been very effective. The catch of herring is considered a freak event in this fishery, as herring is associated with pelagic ecosystems. SSB for herring in 2011 was at a low point, but is was expected by ICES to be almost at a MSYBtrigger in 2013 and above in 2014. This and the Long Term Management Plan proposed for herring, which will come into force in 2015, gives confidence to the effectiveness of this partial strategy for this specie. Fishing mortality for plaice in the Kattegat has dropped since 2006, and SSB has been increasing since 2009. As reported by ICES advice, dab abundance is also increasing in the area, The team considers that general measures such as the effort control and the capacity reduction, improve the status of these stocks and give confidence to the effectiveness of this partial strategy.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
	Justification	The cod recovery plan was established in 2009 and the selective gears became mandatory in 2011 for the Kattegat region. These measures can be viewed as a partial strategy as they intend to avoid the irreversible harm to retained species, but this strategy only takes cod into consideration, not taking into account other stocks.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Cod recovery plan is a big part of this strategy. DTU Aqua Notat states that there has been some recovery of cod stock status. However, the recovery of the cod has not yet been reached, as Spawning Stock Biomass is below limit reference point and Fishing mortality is still above the recommendations. The use of the seltra gear shows some difficulties in the avoidance of flatfish, so it can´t be said that the strategy is achieving its overall objective of ensuring that the fishery does not pose a risk of serious harm to all retained species populations. No species reach this SG100.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant

Species	SG60	SG80	SG100
Dab	N/A	Y	N
Herring	N/A	Y	N
Plaice	N/A	Y	N
Cod	N/A	Y	Y
21 Minor retained species	N/A	N/A	N

Species	SG60	SG80	SG100
Dab	N/A	N/A	N
Herring	N/A	N/A	N
Plaice	N/A	N/A	N
Cod	N/A	N/A	N-
21 Minor retained species	N/A	N/A	N

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species
	Justification	
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » DTU Aqua Notat on the Evaluation of cod avoidance measures in the Kattegat to NaturErhvervstyrelsen, Center for Fiskeri. 8th February 2013. Journr.: 12/09587/MV. (page3). http://stecf.jrc.ec.europa.eu/documents/43805/595663/Evaluation+od+Cod+Avoidance+measures+for+Kattegat_cod_evaluation.pdf » ICES 2013 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » ICES 2013 advice for herring. » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf » http://www.nsrac.org/wp-content/uploads/2012/06/ICES-advice-2012_July10_NSRAC.pdf » http://stecf.jrc.ec.europa.eu/documents/43805/595663/Evaluation+od+Cod+Avoidance+measures+for+Kattegat_cod_evaluation.pdf » Vinther, M., Eero M. (2013). Quantifying relative fishing impact on fish population based on spatio-temporal overlap of fishing effort and stock density. ICES journal of Marine Science 2013. http://icesjms.oxfordjournals.org/content/early/2013/01/22/icesjms.fst001.short
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.1.3

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Information on retained species has been recorded with onboard observers for a long period by SLU and SwAMN on the Swedish fisheries. But as the seltra gear was introduced on February 2013 on the Swedish fleet, and on July 2011 on the Danish one, there isn´t yet any published report on catch composition. The team has found data on seltra catch composition in the STECF 2012 records. The team considers that SG80 is met as those data provide quantitative information on landings and bycatch, but the consequences for the status for all retained species is not yet available.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	ICES 2012 advice for cod can't estimate MSY and states that fishing mortality is unknown. Concerning SSB, the estimates are considered imprecise, however both the assessment with discards and with estimating total removals within the model indicate historically lowest SSB in recent years (in the range of 950 and 1700 tonnes in 2011). The level of SSB estimated from the assessment is in line with the independent estimates of cod biomass based on data from the joint Swedish-Danish fishermen-scientist survey. Moreover, the high number of minor retained species (25) hinders the reaching of SG100.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
	Justification	The team considers that information provided by ICES advices is adequate to support a partial strategy, as the cod recovery plan and the different LTMP can be seen, but as there is no directed strategy for most retained species it is not possible to evaluate and rationalize if the partial strategy it´s achieving its overall objective. Besides, there is a lack of data on the status of some species such as herring, among others.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	N
	Justification	SWAMN and SLU continue to monitor the catches of this unit of certification, but the team considers that the information is not collected in sufficient detail to assess ongoing mortalities to all retained species.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Feekings J, Bartolino V, Madsen N, Catchpole T (2012) Fishery Discards: Factors Affecting Their Variability within a Demersal Trawl Fishery. PLoS ONE 7(4): e36409. doi:10.1371/journal.pone.0036409. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0036409 » ICES 2013 Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » ICES May 2013. Advice for plaice in Subdivisions 21-23. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/ple-2123_201304142222.pdf » Madsen, N & Valentinsson, D. 2010. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience. ICES Journal of Marine Science, 67: 2042–2050. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf » ORCA-EU, The Fisheries Secretariat (FiSH) (2007). A report on IUU fishing of Baltic Sea. http://www.fishsec.org/downloads/1198235739_21059.pdf » Ziegler, F. SIK report 746. Environmental Life Cycle Assessment of Norway lobster (Nephrops norvegicus) caught along the Swedish west coast by creels, conventional trawls and species-selective trawls. A data report. http://www.sik.se/archive/pdf-filer-katalog/SR746(1).pdf		

PI 2.1.3	**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.1

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	There are no 'main' bycatch species to consider in this UoC as even though there are discards in this fishery, most species are retained to a greater or lesser extent. According to STECF 2012 data on landings and bycatch (see table 8), only 3 species are generally discarded, but their weight represents less than 1% of the total catch composition. 500 kilograms of spurdog were also reported by the Danish client, which represents less than 0.1 % of the total catch.		

STECF 2012 data. Danish SELTRA gear. KATTEGAT SEA

FAO code	Species	Landings (Tonnes)	% of Total Landings	Discards (Tonnes)	% of Catch discarded	Catch (Tonnes)	% of Total Catch
PLA	American Plaice	0,004	0,00	15,371	100	15,375	0,21714
JAX	Jack and horse mackerel	0,175	0,01	2,103	92,3	2,278	0,03217
LUM	Lumpfish	0,15	0,01	0,565	79	0,715	0,01010
TOTAL 3 species		0,329	0,02	18,039	N/A	18,368	0,25941
TOTAL (All species)		**1803,002**	**100**	**5277,563**	**N/A**	**7080,565**	**100**

Spurdog is seriously depleted in the OSPAR Area and the stock may be in danger of collapse as a result of unsustainable removal in former target fisheries. While most target fisheries for spurdog collapsed over the past decade, its aggregating habit made this sensitive species highly vulnerable to localized, seasonal fisheries. Until recent years, retention of by-catch from mixed fisheries has also been unrestricted. Stock assessments for spurdog in the North-East Atlantic estimated very low stock status for this onetime highly abundant species. Continued target fishing and retention of bycatch since the above stock assessments are likely to have reduced the stock further and the North-East Atlantic population is presently listed as Critically Endangered in the IUCN Red List (Fordham et al. 2006).

None of these species meets the SG100, as spurdog is nearly depleted and for the other species their stock status situation is not very well documented in the Kattegat Sea.

b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
	Met?	Y	Y	
	Justification	There are no species to consider under the main bycatch species definition.		
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The team considers that as there are no main bycatch species and there is a very low proportion of bycatch species (1% of total catch), SG60 is met.		
References		» OSPAR Commission 2010. Background Document for Spurdog or Spiny dogfish Squalus acanthias. http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.2

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	As there are no main bycatch species to consider, SG80 is met. Regarding all bycatch species, they only represent 1% of the total catch. The team considers that, on the contrary that with the grid gear, it can´t now be stated that there is a strategy for minimizing bycatch. This UoC represents a mixed fishery and the seltra gear is not intended to avoid the catch of other species, but to specifically facilitate the escape of roundfish such as cod. However, the use of this gear along with other management measures and the long term management plans for cod and other species can be seen as a partial strategy. Discard ratio in this UoC is extremely high, but consists of species that are retained to a greater or lesser extent.		

DK seltra. Kattegat Sea. 2012	
Total catch (Tonnes)	7080,565
Total landings (Tonnes)	1803,002
Total discards (Tonnes)	5277,563
% Discards	**74,53**
% Landings	25,46

Species	SG60	SG80	SG100
Main bycatch species	N/A	N/A	N/A
Other minor retained species	N/A	N/A	N

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification			

Species	SG60	SG80	SG100
Main bycatch species	N/A	N/A	N/A
Other minor retained species	N/A	N/A	N

All these LTMP, along with MLS, fishing effort control and quota regulations can be seen as a partial strategy that is working in the avoidance of bycatch. Besides that there are no main bycatch species to consider in this UoC.

c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The cod recovery plan, effort control, the use of selective gears such as seltra are successfully implemented in the area, but are only considered as a partial strategy as the seltra gear is considered as a mixed fishery which targets nephrops along with many other species.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	Cod recovery plan is a big part of this partial strategy. As the recovery of the cod has not yet been reached and the use of the seltra shows some difficulties in the avoidance of flatfish, it can´t be said that this partial strategy is achieving its overall objective, due to this high rate of discards.		

PI 2.2.2	**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**
References	» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.3

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	SLU and SwANM in Sweden and DTU Aqua and the AgriFish Agency in Denmark have been recording data on bycatch on a continuous basis. The team has found data on seltra catch composition in the STECF 2012 records. The team considers that SG80 is met for all species, as those data provide qualitative information and some quantitative information on bycatch, but it is difficult to know the status of all affected populations, given that most of them have poor commercial interest.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The team considers that there is not enough information to quantitatively estimate outcome status with a high degree of certainty for species such as lumpfish or American plaice.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	The team considers that is difficult to evaluate with a high degree of certainty whether the strategy is achieving its objective of adequately managing all bycatch species.		

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	Y
	Justification	Data on bycatch is being collected by SLU and DTU Aqua observers in Sweden and Denmark. The collection of these data is very thorough and all information is open to the general public and can be downloaded at the STECF website.		
References		» Feekings J, Bartolino V, Madsen N, Catchpole T (2012) Fishery Discards: Factors Affecting Their Variability within a Demersal Trawl Fishery. PLoS ONE 7(4): e36409. doi:10.1371/journal.pone.0036409 http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0036409 » Hornborg, S. et al. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated using a life cycle approach. Marine Policy (2012) Figure 4, Page 5. http://www.sciencedirect.com/science/article/pii/S0308597X12000346 » Swedish Government commission L2013/1017/JFS. Government Commission on Monitoring ban discards in Skagerrak. Regeringsuppdrag om kontroll av förbud mot utkast av fisk i Skagerrak. 31/05/2013. https://www.havochvatten.se/download/18.3f5692b613e6622a2eb135a/1369980528925/Regeringsuppdrag+om+kontroll+av+utkastf%C3%B6rbud+i+Skagerrak+L2013_1017_JFS.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 2.3.1

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	N
	Justification	Endangered, Threatened and Protected species are those that are recognized by binding international agreement (e.g. CITES) or legislation (CR 43/2014) As the gear is just implemented in Sweden, the team will study data on endangered species recorded by the Danish client (see Table 27). Among other species not considered ETP species under the MSC standards, records show the following catches for 2012. **Live weight (kilos) of endangered species in the Danish seltra trawl fishery in the Kattegat.** It is highly unlikely that marine mammals and cetaceans interact with this fishery. Northridge (1988) provided several reasons why this species normally avoids the catch on demersal gears. But even so, two harbor porpoises were caught by the seltra Danish gear in 2011 in the Kattegat Sea. However, DTU onboard sampling on 300 trips during 2010 showed no records at all of interactions with this species. The team considers that the effects of this fishery would be very similar to those originated by the seltra Danish trawl, and concludes that these effects are highly likely to be within limits on national and international requirements for the protection of ETP Species. The team can´t give a SG score of 100 as the lack of specific records for all species (including records for the different rays, skates and sharks species) eliminates the high degree of certainty.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N

Species	**KATTEGAT 2011**	
	Individuals	**Kg**
Coral	1	5
Harbour Porpoise	2	45
Ray ssp	780	1315,3

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
	Justification	After the site visit, the team concludes that directed fisheries are highly unlikely to create unacceptable impacts on the ETP Species considered (see Table 23: basking, angel and white sharks, harbor porpoise, common skate, giant manta ray, portbeage and guitarfishes). CR 57/2011 establishes the obligation to report some species of ray separately. Landing ban prohibits the retaining on board of common skate, which is returned to the water. If this return is done quickly there´s a high probability for these species to survive, as different studies show. (Mandelman and Farrington 2007, Revill *et al*.2005, Enever *et al* 2009, Enever *et al*. 2010)		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N
	Justification	Indirect effects of the fishery such as habitat destruction, destruction of egg cases or competition for forage effects have been considered 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.		
References		» Council Regulation (EU) No 43/2014, fixing for 2014 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in EU waters and, for EU vessels, in certain non-EU waters » Enever, R., Catchpole, T.L, Ellis, J.R. and Grant, A. 2009. The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research, Volume 97, Issues 1-2, April 2009, Pages 72-76 http://www.sciencedirect.com/science/article/pii/S0165783609000046 » Enever, R. Revill, A. Caslake, R. and Grant, A. 2010. Discard mitigation increases skate survival in the Bristol Channel. Fisheries Research, Volume 102, Issues 1-2, February 2010, Pages 9-15. http://www.sciencedirect.com/science/article/pii/S0165783609002598 » Northridge, S. An updated world review of interactions between marine mammals and fisheries. FAO fisheries technical paper, 251. http://www.fao.org/docrep/003/t0452e/t0452e00.htm		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 2.3.2

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimize mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y

	Justification	There are measures that are designed to manage impacts of commercial fisheries on ETP species specifically. There is also regulatory protection of ETP species and records on the ETP species caught. There is an Action Plans for Threatened Species of Fish and Shell (Finfo 2007:7). All these measures are considered to constitute a comprehensive strategy to manage ETP These measures include: a) Annual EU fishing opportunities regulations. 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 captured within EU waters. The implication of this is that all common skate or 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. b) 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 set out limits for fishing effort by mobile gears according to mesh size used (TR1, TR2) c) 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*." d) 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. e) 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.

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	Y
	Justification	The team concludes that there is an objective basis for confidence that the strategy will work, as there is a high number of measures, a strict effort control, and a code of conduct establishing steps to take in the event of interactions with ETP species. ETP species in the area have been sampled in Sweden since 2005. For all the above reasons, the team concludes there is a high confidence that the strategy will work.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	Finfo 2007:7 strategy is implemented since 2007, but the team could not ascertain if all elements of the strategy were fully implemented. The lack of direct data from this fishery makes it difficult to check if all the elements of the strategy are successfully implemented.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	As there is no clear evidence yet of the strategy being successfully implemented, there can´t be evidence of it achieving its objective. The team hasn´t found evidence of the absence of landings for these species and there are still remaining doubts about the correct identification of all ETP species.		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
References	» ASCOBANS (2004). Annual national reports submitted to the Secretariat as of 27 April 2004 (Belgium, Germany, Sweden, and UK). Document AC11/Doc. 30(S) presented at the 11th Advisory Committee meeting to ASCOBANS, Jastrzebia Góra, Poland, 27 – 29 April, 2004. http://www.ascobans.org/pdf/ac11/ac11-30.pdf » Fiskeriverter Informerar Finfo2007:7. Atgardsprogram for hotade fiskarter och skaldjur. https://www.havochvatten.se/download/18.64f5b3211343cffddb2800018319/1348912834692/finfo2007_7.pdf » ICES (2010) Report of the study group on Bycatch of Protected Species (SGBYC).ICES ADVISORY COMMITTEE. ICES CM 2010/ACOM:25 http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/SGBYC/sgbyc_final_2010.pdf » 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. http://www.researchgate.net/publication/232978854_Spiny_Dogfish_Mortality_Induced_by_Gill-Net_and_Trawl_Capture_and_Tag_and_Release

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.3

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The Swedish seltra shall be considered as selective as the Danish seltra gear. The Danish fishery has provided records on ETP catches. This information should be sufficient to quantitatively estimate the impact of the fishing for these species, but not enough to quantitatively estimate outcome status of ETP species.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	SLU observer programs and STECF data reports are considered to be adequate to support ongoing monitoring of the fishery's impacts on these species as well as measuring trends, while also to effectively support a strategy to manage impacts. This should be sufficient to determine whether the fishery may be a threat to the protection and recovery of these species. SG 100 can´t be met as the information is not enough to know the magnitude of all impacts and injuries caused to ETP species.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	The team considers that the volume of data provided by ongoing monitoring programs on ETP species is adequate to support measures to manage the impacts on this species, notwithstanding these trends have not yet been measured due to the short record history. Yet, the complete information that is collected should be enough to do so in a short time.
References		» OSPAR 2010. Background Document for Common skate *Dipturus batis*. Available at http://qsr2010.ospar.org/media/assessments/Species/P00477_common_skate.pdf »
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	With Nephrops fisheries targeting softer mud or sandy mud sediment it is highly unlikely that trawling activity would cause irreversible harm. According to Trimmer *et al* (2005) biogeological processes in the upper layers of sediment, both oxic and anoxic, seem unaffected by trawling in the long term. Benthic trawling can alter the organic structure of sediments through a combination of the removal of surficial sediments and the turnover and burial of organic matter (Mayer *et al*. 1991, Watling *et al.* 2001, as cited in Trimmer *et a*l 2005). Jennings *et al.* (2002) showed that the small infauna community (largely polycheates) is unaffected by trawling activity. Since small infaunal polychaetes are a key source of food for flatfishes, the research concluded that beam trawling disturbance does not have a positive or negative effect on their food supply. It is however accepted that trawl gear does impact habitats. Fishing strategy includes the fishing of one vessel after another on the same area, which would reduce the area where these impacts may take place. Fishing intensity of the Swedish fisheries for lobster, cod and other benthic fish were studied in the Kattegat (area of study: 21.000 km2) for the period 2001-2003 (Gislason, page 62. 2013). Nilsson & Zieger (2007) found that more than 44% of the seabed was being fished. The study showed that 55% of hard bottom and 41% of mud bottom was trawled more than twice a year. The study did not include the Danish fishing, and the effects on bottom organisms were not investigated.		
References		» Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. http://icesjms.oxfordjournals.org/content/60/2/371.full » Gislason, H. et al. 2013. Miljøskånsomhed og økologisk bæredygtighed i dansk fiskeri. DTU 2013. Journal nr 12/09478 (Sustainability and ecology of Danish fisheries) » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235 » Humborstad, O.-B., Nøttestad, L., Løkkeborg, S., and Rapp, H. T. 2004. RoxAnn bottom classification system, sidescan sonar and video-sledge: spatial resolution and their use in assessing trawling impacts. ICES Journal of Marine Science 61, 53-63. http://icesjms.oxfordjournals.org/content/61/1/53.full.pdf		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	» 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Jennings S, Nicholson MD, Dinmore TA, Lancaster JE (2002) Effects of chronic trawling disturbance on the production of infaunal communities. Mar Ecol Prog Ser 243:251–260 http://www.int-res.com/articles/meps2002/243/m243p251.pdf » M. J. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » OCEANA. Conservation proposals for ecologically important areas in the Baltic Sea. 2011. http://oceana.org/en/eu/media-reports/publications/baltic-conservation-proposals-for-ecologically-important-areas-in-the-baltic-sea » 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. http://www.int-res.com/abstracts/meps/v298/p79-94/
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.2

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Most of the fishing effort takes place over soft seabed sediments such as mud and sandy mud, and the effort area is identified by the Vessel Monitoring Systems. Kattegat is a studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). There are also different proposals for conservation sites by NGO´s. There are Marine Protected Areas protected from trawling due to the general trawl boundary, and the regulation to protect reefs inside this boundary. The Evaluation of closed areas in Kattegat reports that several closed areas were established in 2009 in the northern part of the Sound with the aim to protect local cod population, as it was seen that those areas were nursery areas for the cod. These areas include: » Permanently closed area closed for all fisheries, including recreational fisheries. » Partially closed areas closed for all fisheries in the period 1st January to 31st March. Fisheries with selective gears such as the grid are allowed to fish here from 1st April to 31st December. » Bigger seasonally closed area closed from the 1st January to 31st March, except for fisheries with selective gears such as the grid. The team considers the Natura 2000 network as a strategy for managing the impact of the fishery on habitat types.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	N	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Justification	The Sound area has been closed to trawling for many years and illustrates that the strategy of spatial management works when implemented. As since 2009 there is an exclusion from the effort regime for vessels fishing with a selective gear (Article 11.2.b, Cod Recovery Plan: The Council may, acting on a Commission proposal and on the basis of the information provided by Member States and the advice of STECF referred to in paragraph 3, exclude certain groups of vessels from the application of the effort regime provided that: the percentage of cod catches as assessed by STECF does not exceed 1,5 % of the total catches for each group of vessels concerned) there can´t be a high confidence in the efficiency of the strategy, as seafloor habitats protection decreases as impacts on the sea floor still occur. Swedish control 2009-2011 reported a total of 27 inspections at sea which resulted in two infringements. But air surveillance resulted in 22 reported infringements. All infringements were detected in the permanently closed area. (Evaluation of closed areas in the Kattegat, page 3). This area is very sensitive for the recovery of the cod. Management of the closed areas in Kattegat seems to be established, but there are still infringements. Other habitats subject to protection are the Natura2000 sites in the Kattegat (such as Anholt, Stradenge pa laeso og havet syd herfor, Havetomkring nordre runner, Laesotrindel og tonneberg banke, Kims top og den kinesiske mur, Fladen, Lilla middelgrund, Stora middelgrund och rode bank, Lysegrund, Hesselo, Morups bank). VMS maps show a higher impact of the fisheries in Kims top og den kinesiske mur, Fladen and Lilla middelgrund areas. The regulation of these areas is therefore needed. Until management measures are designed and implemented there is no objective basis for confidence that this strategy will work, as at present the strategy is limited to specifying Natura sites which should need more protection but aren´t regulated yet. Management measures need to be implemented in these areas in order to achieve a confidence in the strategy effectiveness.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The establishment of these protected areas is considered as evidence of the success of the implementation of this strategy, but the lack of defined management measures and enforcement in Natura 2000 sites, (which should include the ability to modify fishing practices in the light of monitoring results), prevents the fishery from achieving a SG100. Therefore, a SG80 is given.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
	Justification	The team considers that there is no evidence that the strategy is achieving its objective of not posing a risk of serious or irreversible harm to habitats types, as there is still the need of implementation of management measures in some areas.
References		» Board of Fisheries regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea https://www.havochvatten.se/miljopolitik-och-lagar/lagstiftning/svensk-lagstiftning/havs--och-vattenmyndighetens-forfattningssamling/register/fiskeriverkets-foreskrifter-fifs-200436-om-fiske-i-skagerrak-kattegatt-och-ostersjon.html » Council Regulation 1342/2008. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Fish and benthic environment at the Swedish west coast, 2004-2009: Effects of jet boundary relocation and other fishing regulations. Fiskeriverter informerar. F-info 2011:6 https://www.havochvatten.se/download/18.64f5b3211343cffddb2800012608/1348912838177/finfo2011_6.pdf » http://natura2000.eea.europa.eu/# » http://www.naturstyrelsen.dk/Naturbeskyttelse/Natura2000/Natura_2000_planer/Se_Planerne/001_125/ » http://projektwebbar.lansstyrelsen.se/kosterhavet/Sv/Pages/default.aspx » SwAMN. Evaluation of closed areas in Kattegat to promote the rebuilding of the cod stock. https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf

OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**3**

Evaluation Table for PI 2.4.3

PI 2.4.3		**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	Kattegat Sea has been very well studied over the years and there are numerous studies and high resolution maps on the distribution of all main habitats types.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	Trawling activity generates disturbance on muddy and sandy sediments, as they are suspended in the water column and relocated again. Effects such as bottom damage, seabed relief, sediment sorting and species survival, abundance and recovery have been studied in different research programmes. The team considers that there is enough information to identify the nature of the impacts and the spatial and temporal extent of the interaction.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	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 these data are available for assessing the scale of risk to habitat on an ongoing basis. 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 closed areas and Natura 2000) are being undertaken and will be required to continue into the future under the Habitats Directive and under commitments to OSPAR. . The Danish NOVANA Programme is responsible for monitoring habitat distributions and characteristics. There is also a great involvement of different NGO´s in the study of these habitats.
References		» Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic populations caused by trawl fisheries on the Dutch continental shelf in the North Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331. http://icesjms.oxfordjournals.org/content/57/5/1321.abstract » Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L., and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. http://icesjms.oxfordjournals.org/content/60/2/371.full » Hiddink, J. G., Jennings, S., Kaiser, M. J., Queirós, A. M., Duplisea, D. E., and Piet, G. J. 2006a. Cumulative impacts of seabed trawl disturbance on benthic biomass, production and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Sciences, 63: 721-736. http://library.wur.nl/WebQuery/wurpubs/355235 » ICES WGMHM REPORT 2009: Report of the Working Group on Marine Habitat Mapping. http://www.aquabiota.se/publikationersveng/pdf/wgmhm09.pdf » 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. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2656.2001.00504.x/pdf » Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. http://icesjms.oxfordjournals.org/content/55/3/353.full.pdf » Kenchington, E.L.R., K.D. Gilkinson, K.G. MacIsaac, C. Bourbonnais-Boyce, T.J. Kenchington, S.J. Smith & D.C. Gordon Jr. 2006. Effects of experimental otter trawling on benthic assemblages on Western Bank, northwest Atlantic Ocean. Journal of Sea Research 56: 249-270. http://www.vliz.be/imis/imis.php?module=ref&refid=102812&pp=print » Løkkeborg, S. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO Fisheries technical paper 472. 2005 http://www.fao.org/docrep/008/y7135e/y7135e00.htm » Evaluation of closed areas in Kattegat to promote the rebuilding of cod stock https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf

PI 2.4.3	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	» Greenpeace. Oresund. http://www.greenpeace.org/denmark/da/press/rapporter-og-dokumenter/2013/Oresund---et-unikt-farvand-i-Danmark/ » Madsen, N. & Valentinsson, D. 2012. Use of selective devices in trawls to support recovery of the Kattegat cod stock: a review of experiments and experience ICES Journal of Marine Science Advance. http://icesjms.oxfordjournals.org/content/67/9/2042.full.pdf+html?sid=43c94723-273e-4f6f-b5eb-4cfcd709d503 » NOVANA Programme (National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment). http://www2.dmu.dk/1_viden/2_publikationer/3_fagrapporter/rapporter/fr532.pdf » Oceana, 2011. Fisheries management in the Baltic Sea. How to get on a track to a sustainable future in Baltic fisheries. http://oceana.org/en/eu/media-reports/publications/fisheries-management-in-the-baltic-sea-how-to-get-on-track-to-a-sustainable-future-in-baltic-fishe » Oceana, 2011. Conservation proposals for ecologically important areas in the Baltic Sea. http://oceana.org/en/eu/media-reports/publications/baltic-conservation-proposals-for-ecologically-important-areas-in-the-baltic-sea » Oceana, 2013. Oceana proposal for a Marine Protected Area: Kattegat trench (Baltic Sea Project). http://oceana.org/sites/default/files/euo/OCEANA_10_Kattegat_Trench.pdf » Master's thesis by Christina Dahl Pommer, C.D., 2011. Does trawling impact the Benthic Communities in Kattegat? Master thesis. University of Copenhagen.
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.1

PI 2.5.1		**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	N
	Justification	Nephrops is low trophic level species and is common prey for numerous marine species. There is a temporal coincidence in the decline of other species and nephrops abundance, which suggests a relationship between them. Nephrops main diet consists of crustaceans, molluscs, and to a lesser extent polychaetes and echinoderms (Parslow-Williams *et al*., 2002). Differences in diet appear to be due more to changes in prey abundance than to prey preference (Parslow-Williams *et al.*, 2002) indicating that the species is an opportunistic predator. *Nephrops* is preyed upon by different species some of which are listed below: » Research in Scotland showed that 80% of cod had Nephrops norvegicus amongst their stomach contents (Thomas, 1965b). Cod is by far the main predator of the Icelandic Nephrops stock (Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication) » Nephrops was also found in 52% of the thornback ray Raja clavata that were sampled (Thomas 1965b). » In the Clyde, Nephrops was found in 51% of the small spotted catshark (dogfish) Scyliorhinus canicula that were sampled (Gordon & De Silva, 1980). Gordon et al. studied the effects of otter trawling on benthic habitat and communities on Western Bank. Although not specific to this UoC, results indicated very limited immediate impacts on the benthic community. The structure of the colonial epifaunal assemblage was not affected by repeated trawling over three years. However, the total biomass of colonial epifauna was significantly reduced. The team considers that due to the healthy status of the nephrops and the low abundance of predators it is highly unlikely that biodiversity, community structure and productivity are adversely impacted by this fishery. The high discard rate prevents the fishery from achieving a SG100, as, even though it seems to be a high abundance of dab no reference points have been defined yet for this and other species.		
References		» Björnsson, B. and Dongala Dombaxeb, M.A. ICES Journal of Marine Science. (2004) 61 (6):983-991. Quality of Nephrops as food for Atlantic cod (*Gadus morhua* L.) with possible implications for fisheries management. http://icesjms.oxfordjournals.org/content/61/6/983.abstract » Gordon, J.D.M. and de Silva, S.S. (1980). The fish populations of the West of Scotland Shelf. Part I, Oceanographic Marine Biology Annual Review, 18, 317-366		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
	» Hrafnkell Eiríksson, Marine Research Institute, Reykjavík, personal communication. » http://www.marlin.ac.uk/biotic/browse.php?sp=4390 » Parslow-Williams P., Goodheir C., Atkinson R.J.A., Taylor A.C. Feeding energetics of the Norway lobster, *Nephrops norvegicus* in the Firth of Clyde, Scotland. Ophelia2002; 56:101-120. http://cel.webofknowledge.com/InboundService.do?SID=U2IdkSsNrYtswp8HOi8&product=CEL&UT=000178458400004&SrcApp=Highwire&Init=Yes&action=retrieve&Func=Frame&customersID=Highwire&SrcAuth=Highwire&IsProductCode=Yes&mode=FullRecord
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.2

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	Y
	Justification	The team considers that there is a strategy to protect the Kattegat ecosystem, focused in the recovery of the cod stock. Measures in place, such as the closed areas, the cod recovery plan, the enforcement effort, the collaboration between the Swedish and Danish fisheries agencies, the establishment of Natura 2000 sites, the quota assigned, and the use of selective gears can be seen as a planned strategy.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	EU fisheries should address the precautionary and ecosystem approach in their management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help co-ordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE). Furthermore legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations and Norway-EU agreements. It is therefore assessed that there are a series of measures in place that constitute a strategy to address impacts on the ecosystem. But this strategy is highly focused on the recovery of cod and does not pay the same attention to other impacts. Therefore, SG100 is not met.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	The team considers that this combination of spatial and fishery-specific management is likely to work in relation to achieving or maintaining ecosystem integrity. Nevertheless, more measures should be implemented to assess impacts in other zones of the Kattegat apart from the closed areas.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N
	Justification	The designation of closed areas, Natura 2000 sites, effort control, management of fisheries, inspections on board and aerial surveillance suggests that the strategy is implemented in the closed areas, but not in the whole Kattegat Sea.		
References		» Evaluation of closed areas in Kattegat to promote the rebuilding of cod stock https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf » ICES CM 2009 ACOM Advisory Committee: 20 Report of the Working Group on the Assessment on Ecosystem Effects of Fishing Activities. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WGECO/wgeco_final_2009.pdf » ICES. 2002. Report of the Working Group on Ecosystem Effects of Fisheries. Advisory Committee on Ecosystems.		

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

Evaluation Table for PI 2.5.3

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	Kattegat ecosystem has been studied by different institutions over the years. There is relevant information to understand the key elements of the ecosystem and its functions. These key elements include the trophic structure of the Kattegat ecosystem, such as prey, predators and competitors, community composition, productivity patterns and biodiversity characteristics. ICES reports on stocks assessment also provide relevant information to know the status of the different components of the fishery. For this reason, the team considers that the information is adequate to broadly understand the key elements of the fishery.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Main impacts of the fishery on these key elements can be inferred from existing information, such as the Mackinson & Daskalov (2007) Ecopath model of the North Sea (which includes the Kattegat). This model is able to answer questions such as the response of the ecosystem to changes, and can be used as a basis in the design of policies aimed at implementing ecosystem management principles, and can provide testable insights into changes that have occurred in the ecosystem over time.		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	Nephrops is a low trophic species and its relationship with other species is known. The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known. Direct and indirect impacts of the fishery on both ETP species and seabed habitats are known with a reasonable degree of accuracy.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred. The poor data on records from some sections are corrected by the good records of the Danish fisheries fishing in the same area. These data are sufficient to allow the main impacts on these components to be inferred directly.		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	N
	Justification	Sufficient data continue to be collected through various organizations. Data are routinely collected on an ongoing basis to allow for the detection of any change or increase in risk level to the main ecosystem components. But an advice on mixed fisheries in the Kattegat would provide information sufficient to support the development of strategies to manage ecosystem impacts.		
References		» Annual report for the Swedish National Programme for collection of fisheries data 2012. Swedish Agency for Marine and Water Management. https://www.havochvatten.se/download/18.2a9b232013c3e8ee03e7a3f/1364904967368/Sweden_NP_Proposal_2011-2013_Text_26-Mar-2013.pdf » Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp. http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Principle 2

UoC 5 Skagerrak Creel

Evaluation Table for PI 2.1.1

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	N/A	N/A	N
	Justification	Catch composition for the Swedish creels fishing in the Skagerrak Sea. Data have been obtained from the STECF 2012 database. Species in bold in green shaded cells represent main retained species.		

STECF 2012 data. SW Skagerrak creels. 2012			
Species		**Landings (Tn)**	**% Catch composition**
NEP	Nephrops	177,366	93,33
CRE	**Edible crab**	10,506	5,52
COD	**Cod**	1,242	0,65
LIN	Ling	0,433	0,22
CAT	Catfish	0,28	0,14
WHG	Whiting	0,122	0,06
DAB	Dab	0,08	0,04
POK	Saithe	0,001	0,01
POL	Pollack	0,005	0,002
HER	Herring	0,002	0,001
TOTAL		**190,037**	**100**

There is a high degree of certainty that crab abundance is high (T. Jansson Maser Thesis 2008, and Annete Ungfors Doctoral Thesis 2008). The suitable crab habitat combined with the density estimates from Fjällbacka would indicate that the catchable population of crabs on the Swedish west coast would be approximately 10-22 million (95 % confidence interval) crabs. The stock biomass of edible crabs available for the Swedish fishermen in Kattegat and Skagerrak is estimated to 4-8 million edible crab or 1600-2600 tonnes. Besides, Fishing mortality is low and no trend (decreasing or increasing) in logbooks landing per unit effort (LPUE) can been seen over the last 13 years. Cod is considered as a main retained species due to the vulnerability of the stock. ICES Advice 2013 for cod in Skagerrak shows that there has been a gradual improvement in the status of the stock over the last few years and SSB is now in the vicinity of Blim, but target reference points are not reached yet.

Species	SG60	SG80	SG100
Cod	N/A	N/A	N
Edible crab	Y	Y	Y

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	Cod stock status has been studied for many years because of its commercial importance. Target reference points are well defined by ICES. Cod therefore meets the SG100. As there are no target reference points for crab it does not meet this SG. <table><tr><td>Species</td><td>SG100</td></tr><tr><td>Cod</td><td>Y</td></tr><tr><td>Edible crab</td><td>N</td></tr></table>		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The team considers that the use of the creel avoids the catch of retained species and bycatch, so it considers the use of the creel as a strategy that ensures that the fishery does not hinder the recovery and rebuilding of the cod stock. The long term plan for cod stocks (CR 1342/2008), the quota system, and the effort control contribute to prove the effectiveness of these measures. Cod therefore meets the SG80. Crab is not outside biologically based limits. Therefore is not to be considered under this SG.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	Justification	The status of the cod is very well known over the years. Also, the use of the creel is a practice which avoids the catch of cod and other species. All species reach a SG60.
References		» ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors, A. Doctoral Thesis (2008) "Fisheries biology of the edible crab (*Cancer pagurus*) in the Kattegat and the Skagerrak. Implications for sustainable management", http://www.gu.se/forskning/publikation/?publicationId=112249 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.1.2

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There´s a comprehensive recovery plan for cod under CR 1342/2008 which is considered as a management strategy for this retained species. There are also specific limitations for the creel fishery which limit the exploitation rate of crabs, such as the MLS and the number of creels allowed per boat (800 creels for boats with one fisherman and 1400 creels for boats with two fishermen). Creels must be set at depths deeper than 30m. Vessels participating in the creel fishery normally vary from 5 -12.7m length, being most of them at the 8-10 m interval. 25 % of total Swedish quota is allocated to the creel fishery (341 Tonnes, both for Skagerrak and Kattegat). (Ungfors, 2013). These limitations on the creel fishery can be seen as a strategy to manage retained species, therefore a SG100 is given. Vessels over 10m are obliged to report retained species in the logbook daily, and, if under 10 m, monthly. The exhaustive record of catch composition at STECF website also supports the SG100.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	ICES Advice 2013 for cod in the North Sea (including Skagerrak) suggests that the cod recovery plan for North Sea is working in improving stocks, albeit the low levels that the stock still poses. Cod meets the SG100. Crab abundance gives confidence on the effectiveness of the strategy. The small proportion of total retained species (6%) also supports this statement.		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	Cod recovery plan is being implemented since 2009 and it has shown an improvement in the cod status in the area. Nevertheless, the low amount of retained species supports a SG100 for all species.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	The team considers that the cod strategy is not yet achieving its overall objective, as Spawning Stock Biomass is just around the limit reference point and Fishing mortality is still above the recommended level. Crab and other retained species don´t reach this SG due to the lack of evidence regarding the effects of this fishery on these species.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf		

PI 2.1.2	**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**
	» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.3

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Qualitative and quantitative information is being recorded by SWAMN and SLU observers for some years. There is also a comprehensive record of data on STECF website which would support SG100, but the difficulties in knowing the status and consequences for all affected populations prevents the scoring issue from reaching a SG 100. As the latest observer reports provides data from 2005 (Jansson, 2008), the team considers that this limited observer data also prevents the fishery from achieving SG100. All species reach a SG80.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	ICES estimates outcome status, but with the given information it is not possible to quantitatively estimate the outcome status with a high degree of certainty for all species.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	Information is adequate to support the cod recovery plan and evaluate the efficiency of it, as in ICES cod advices. All species reach a SG100.		

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y
	Justification	Cod recovery plan assures a continuous monitoring of this species. Besides that, data on retained species are recorded in the logbook and there continues to be research on the issue. All species reach a SG100.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » STECF Data Collection Framework. http://stecf.jrc.ec.europa.eu/data-reports 2013 App 08 landings by rectangle by country.xlsx » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.		

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.1

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	Data from research and trials in the creel fishery show the following catch composition: 90 % of nephrops (of which 75% are above MLS and 15% under MLS, therefore, discarded), and a 10% of miscellaneous fish which are discarded. Even though STECF database is very comprehensive and shows discards of all other gears, no discards at all have been recorded for the creel fishery. It is known that both undersized nephrops and the various fish (of which many are poor cod *Trisopterus minutus*) are discarded at the point of capture with a very high survival rate, as the animals don´t get harmed during their interaction with the creel. But the lack of data on the miscellaneous fish discarded by the creels makes it difficult to reach a SG100. All species reach SG80.		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The use of the creels is seen by the team as an effective strategy to avoid the catch of retained species or bycatch. All species reach SG80.		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups
	Justification	As said before, there´s a proportion of bycatch which has not been identified, as report only shows "miscellanea fish" for a group of them. But the team considers that the creel fishery does not hinder the recovery of bycatch or retained species. All species reach a SG60.
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Bergmann & Moore, 2001. Survival of decapod crustaceans discarded in the Nephrops fishery on the Clyde Sea area, Scotland. http://icesjms.oxfordjournals.org/content/58/1/163.full.pdf » STECF Data Collection Framework. http://stecf.jrc.ec.europa.eu/data-reports 2013 App 08 landings by rectangle by country.xlsx » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. Page 280. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.2

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	The team considers that the use of the creel and its management can be seen as a strategy for managing and minimizing bycatch. As the number of creels is limited by vessel, the data collected in logbooks, there´s a quota allocated to the fishery, and a high survival rate of discards, therefore the UoC reaches a SG100 for all species.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	The creel fishery has been under research to certify it´s low impact on the environment. Fishermen and scientists claim that nephrops caught with creel are alive and present much better condition, as they are not harmed during the process. Due to the benign nature of the capture process, it is expected that the mortality of fish discarded from traps may be low as the catch is usually alive, with low injury rates. Experiment with passive gears such as fish pots, hand lines and fyke nets showed that 90% of the cod were viable for tagging and release. (Nostvik and Pedersen, 1999). Therefore, it can be concluded that bycatch shouldn´t be harmed either. All species reach a SG100.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
	Met?		Y	Y
	Justification	Fishermen's traditional behaviour regarding bycatch has been to release this catch from the creels immediately on hauling so that survival can be maximised. This contributes significantly to the success of the strategy. Therefore, all species reach a SG100.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	The low proportion of observer trips onboard these vessels, as well as their small size, makes it difficult to carry out a comprehensive monitoring of the activities of the vessels in the creel fisheries. No species reach the SG100.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES 2013. Advice for cod in the North Sea. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-347.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Nøstvik, F and Pedersen, T. 1999. Catching cod for tagging experiments. Fish. Res. 42: 57-66. http://www.sciencedirect.com/science/article/pii/S0165783699000375 » STECF Data Collection Framework. http://stecf.jrc.ec.europa.eu/data-reports 2013 App 08 landings by rectangle by country.xlsx » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		

PI 2.2.2	**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.3

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Research on creels is a source of qualitative and quantitative information on the amount of bycatch species taken by the fishery. But that is not enough to assert that there is information on all bycatch species and that the information is verifiable. All species reach a SG80. Investigations into Nephrops creel fisheries are limited to the Scottish west coast, where fish bycatch varies seasonally and includes poor cod, and more occasionally cod, haddock, whiting, conger eel, and ling. Other crustaceans, starfish and gastropods also feature in catches. This by-catch is largely discarded, and survival is generally considered to be high. (Phillips, 2006, page 438)		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The lack of information on bycatch composition prevents this fishery from achieving a SG100. Information is not accurate, but the team considers that it is sufficient to estimate outcome status, due to the small proportion of bycatch. In 2005–2006, an observer survey in the Swedish creel fishery (Jansson, 2008; more than 12,000 creels recorded for 26 vessels) found that on average 75% of the capture by weight consisted of the targeted Nephrops, 15% of under-sized Nephrops (under 40-mm CL) and 10% of fish such as cod and poor cod (*Trisopterus minutus*). (Ungfors et al. 2013). All species reach a SG80.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
	Justification	The low proportion of bycatch and the high rate of survival leads to the high degree of certainty of the effectiveness of the strategy, but the lack of information on which species comprise the bycatch of this fishery prevents it from scoring SG100. Therefore, a SG80 is given for all species.		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	N
	Justification	Data are collected through SLU and other organizations, but this monitoring is not conducted often enough to assess ongoing mortalities to all bycatch species, as the last report to which the team had access is from year 2005 (Jansson, 2008). All species reach a SG80.		
References		» Phillips, B. (Editor). Lobsters: Biology, management, aquaculture and fisheries. 2006 (Page 438). http://books.google.es/books?hl=en&lr=&id=Hp6otrU_y0QC&oi=fnd&pg=PA1982&dq=Lobsters:+Biology,+management,+aquaculture+and+fisheries.+2006&ots=9prvHi995Z&sig=MFK80wmNF9D5jrb0HfW3HvmH6l4#v=onepage&q=Lobsters%3A%20Biology%2C%20management%2C%20aquaculture%20and%20fisheries.%202006&f=false » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 2.3.1

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	Y
	Justification	As reported in other UoC´s, the main ETP species in the area would be common skate, basking, angel and white sharks, giant manta ray, portbeage and guitarfish (elasmobranchii) and harbor porpoise (cetacea). The team does not expect the effects of this fishery to be within the limits for protection for these species.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N
	Justification	Information in the area is scant, but the only expected effects would be scratches on the animal skin, which obviously are direct effects but are not considered to create unacceptable impacts on these species.		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y
	Justification	The team considers that there Are no significant detrimental indirect effects of the creel fishery on these species, such as it would be the depletion of the prey or changes on the trophic webs in the area.		
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf		

PI 2.3.1	**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**
	» Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Northridge, S. An updated world review of interactions between marine mammals and fisheries. FAO fisheries technical paper, 251. http://www.fao.org/docrep/003/t0452e/t0452e00.htm » OSPAR Commission 2010. Background Document for Spurdog or Spiny dogfish Squalus acanthias. http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.2

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimize mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y

	Justification	There are measures that are designed to manage impacts of commercial fisheries on ETP species specifically. There is also regulatory protection of ETP species and records on the ETP species caught. There is an Action Plans for Threatened Species of Fish and Shell (Finfo 2007:7). All these measures are considered to constitute a comprehensive strategy to manage ETP These measures include: a) Annual EU fishing opportunities regulations. 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. The implication of this is that all common skate or 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. b) 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 set out limits for fishing effort by mobile gears according to mesh size used (TR1, TR2) c) 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*." d) 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. e) 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.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or	There is an objective basis for confidence that the strategy will work, based on information directly	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
		comparison with similar fisheries/species).	about the fishery and/or the species involved.	supports high confidence that the strategy will work.
	Met?	Y	Y	Y
	Justification	The team concludes that there is an objective basis for confidence that the strategy will work, as there is a high number of measures, a strict effort control, and a code of conduct establishing steps to take in the event of interactions with ETP species. ETP species in the area have been sampled in Sweden since 2005. For all the above reasons, the team concludes there is a high confidence that the strategy will work. Besides, the creels are not expected to cause irreversible harm on the ETP species considered.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	Finfo 2007:7 strategy is implemented since 2007, but the team could not ascertain if all elements of the strategy were fully implemented. The lack of direct data from this fishery makes it difficult to check if all the elements of the strategy are successfully implemented. The use of acoustic deterrent devices would help in achieving this goal.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	As there is no clear evidence yet of the strategy being successfully implemented, there can´t be evidence of it achieving its objective. The team hasn´t found evidence nor records of interactions between the creels and the species, which could mean that there are no interactions or that these are not recorded.		
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
	» Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.3

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The team considers that there is sufficient information to quantitatively estimate the impacts of the creel fishery on ETP species, but the lack of records of interactions for this UoC weakens the certainty of these estimations and prevents the fishery from achieving the SG100.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	The team considers that the available information is sufficient to determine whether the fishery may be a threat to the protection of ETP species, but is not enough to quantify all impacts or injuries that ETP species may suffer due to the creels.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	Y

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	The team considers that the available information should be sufficient to support a comprehensive strategy to minimize the impacts and injuries of the creel fishery on ETP species.
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497
OVERALL PERFORMANCE INDICATOR SCORE:		**85**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	Eno et al (2001) studied impacts of trap fishing on emergent fauna (sponges, bryozoans, ascidians, soft corals and tube worms) at three sites off the British Isles, concluding that impacts were generally low. Soft, erect fauna (sea pens) tended to bend in response to the pressure wave. Impacts on other emergent fauna were limited. More information can be found on the Workshop on effects of fishing gear on marine habitats in the north-eastern US (NEFMC 2002) which concluded that the degree of impact caused by pots and traps to biological and physical structure and to benthic species in mud, sand and gravel habitats was low. The primary direct impacts of any kind of pot are the scouring of the bottom and injury or death to benthic organisms that occur directly under the pot. The panel concluded that the degree of impact caused by pots and traps to biological and physical structure and to benthic prey in mud, sand and gravel habitats was low. Research on the habitat impacts of the creel fishery show a very small proportion of seafloor impacted. The entire west coast creel fishery, landing 20% of the total lobster catch, affected the same seafloor area as did 1 hour of trawling (Ziegler & Valentinsson, 2008). Also, seafloor disturbance caused by creels can be considered to be much less harmful to the habitat that the majority of fishing gears. It is considered that the creels don´t cause irreversible harm to the habitat.		
References		» Eno, N. C., D. S. MacDonald, J. A. M. Kinnear, S. C. Amos, C. J. Chapman, R. A. Clark, F. St. P. D Bunker and C. Munro. 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58: 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.full.pdf+html » Kinnear, J.A.M. et al. 1996. Effects of nephrops creels on the environment. Fisheries research Services, report 2/96. http://www.scotland.gov.uk/Uploads/Documents/frsr296.pdf » NEFMC 2002. Workshop on the effects of fishing gear on marine habitats off the north eastern United States, October 23-25, 2001, Boston, Massachusetts. Northeast Fish. Sci. Cent. Ref. Doc 02- 01: 86 pp. (Northeast Region Essential Fish Habitat Steering Committee) http://nefsc.noaa.gov/publications/crd/crd0201/crd0201.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.2

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Skagerrak is a studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). There are also different proposals for conservation sites by NGO´s. The establishment in 2009 of the Kosterhavet National Park as the first marine national park shows an improvement in the management of marine habitats types. Therefore, the team considers that there is a strategy in place for managing the impact of the fishery on habitat types.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N
	Justification	Until management measures are designed and implemented there is not an objective basis for confidence that this strategy will work, as at present the strategy is limited to specifying areas which should need more protection but aren´t regulated yet. Management measures need to be implemented in these areas in order to achieve a confidence in the strategy effectiveness. There are various Natura2000 sites in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden: Varedofjorden, Store Rev, Lonstrup Rodgrund, Gule Rev, Gullmarsfjorden and Herthas flak). These areas are Natura 2000 sites designated to protect birds and mammals. The regulation of these areas is therefore needed.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Justification	The establishment of these protected areas is considered an evidence of the success of the implementation of this strategy, but management measures in these areas should be clearly specified. There are a large number of Natura2000 sites in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden: Varedofjorden, Store Rev, Lonstrup Rodgrund, Gule Rev, Gullmarsfjorden and Herthas flak), but, even though the need for fishing regulation in these areas is known, this regulation is not yet implemented. Besides that, there is a regulation on the number of creels each vessel can drop, and some small limitations regarding the areas of the fishery. (Ungfors, 2013). These can be considered as measures to limit the plausible harm that the fishery could cause to the habitat, but the difficulty to carry on enforcement measures also contributes to the failure of SG100.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			N
	Justification	The team considers this strategy hasn´t provided evidence yet of achieving its objective.		
References		» Board of Fisheries regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea https://www.havochvatten.se/miljopolitik-och-lagar/lagstiftning/svensk-lagstiftning/havs--och-vattenmyndighetens-forfattningssamling/register/fiskeriverkets-foreskrifter-fifs-200436-om-fiske-i-skagerrak-kattegatt-och-ostersjon.html » Council Regulation 1342/2008. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Eno, N. C., Mac Donald, S. D., Kinnear, J. A. M., Amos, C. S., Chapman, C. J., Clark, R. A., Bunker, F. St. P. D. and Munro, C., 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58, 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.abstract » Fish and benthic environment at the Swedish west coast, 2004-2009: Effects of jet boundary relocation and other fishing regulations. Fiskeriverter informerar. F-info 2011:6 https://www.havochvatten.se/download/18.64f5b3211343cffddb2800012608/1348912838177/finfo2011_6.pdf » http://natura2000.eea.europa.eu/# » http://www.naturstyrelsen.dk/Naturbeskyttelse/Natura2000/Natura_2000_planer/Se_Planerne/001_125/ » http://projektwebbar.lansstyrelsen.se/kosterhavet/Sv/Pages/default.aspx » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282.		

PI 2.4.2	**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.3

PI 2.4.3		**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	N
	Justification	This area has been very well studied over the years and there are numerous studies on the distribution of all main habitats types. But the fact that new areas are still proposed as Marine Protected Areas and some of them have just received such consideration (as the coral reefs in the Bratten area, which was declared protected area just in 2011) makes it difficult for the team to assert that all vulnerable habitat types are known.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	The team considers that there is enough information to identify the nature of the impacts and spatial and temporal interaction are recorded in logbooks. Creel fishing has been shown to have no, or very little, disturbance effect on benthic fauna (Eno, et al., 2001). However, these impacts have not yet being quantified fully in the area.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	The team considers that sufficient data are not being collected, as spatial extent of the habitat affected by the creel fishery is not exactly known due to the lack of vessel monitoring system onboard. However, spatial information is recorded in logbooks. Days at sea and vessel quotas are also monitored on an ongoing basis and these data are available for assessing the scale of risk to habitat on an ongoing basis. Considering this, knowing total licenses creel vessels could be sufficient to determine increase in risks to Habitat outcome. 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 closed areas and Natura 2000) are being undertaken and will be required to continue into the future under the Habitats Directive and under commitments to OSPAR. The NOVANA Programme is responsible for monitoring habitat distributions and characteristics. There is also a great involvement of different NGO´s in the study of these habitats.
References		» ICES WGMHM REPORT 2009: Report of the Working Group on Marine Habitat Mapping. http://www.aquabiota.se/publikationersveng/pdf/wgmhm09.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497

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

Evaluation Table for PI 2.5.1

PI 2.5.1		**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	Main impacts of the creel fishery have been investigated. Creel fishing has been shown to have no, or very little, disturbance effect on benthic fauna (Eno, et al., 2001). They are considered highly unlikely to disrupt the key elements underlying ecosystem structure and function, or cause irreversible harm to the ecosystem, due to its small seafloor disturbance, its small proportion of bycatch, the high rate of discard survival, and the absence of interactions with ETP species.		
References		» Eno, N. C., Mac Donald, S. D., Kinnear, J. A. M., Amos, C. S., Chapman, C. J., Clark, R. A., Bunker, F. St. P. D. and Munro, C., 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58, 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.abstract » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Kinnear, J.A.M. et al. 1996. Effects of nephrops creels on the environment. Fisheries research Services, report 2/96. http://www.scotland.gov.uk/Uploads/Documents/frsr296.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 2.5.2

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	The team considers that there are measures in place, such as the quota assigned, the use of the creels and the licensing of vessels. Vessels over 10m are obliged to report retained species in the logbook daily, and, if under 10 m, monthly. The joint application of these measures can be considered as a partial strategy, but this falls short of a full ecosystem plan for the Skagerrak area. The establishment of effectively closed areas would help to achieve SG100 in the Skagerrak.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	EU fisheries should address the precautionary and ecosystem approach in their management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help co-ordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE). Furthermore legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations and Norway-EU agreements. It is therefore assessed that there are a series of measures in place that constitute a partial strategy to ensure the impacts of the creels on the ecosystem achieve Ecosystem Outcome SG80, but this doesn´t constitute a plan for the development of a full strategy, as further knowledge on spatial position would be needed.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	Y
	Justification	The team considers that besides the lack of complete information of the creel fishery position, the measures in place such as the quota allocated, the licensing of the vessels and the return to the sea of discards should minimize the harm to the ecosystem.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	Y
	Justification	These measures are being implemented successfully, as licenses are necessary in order for the boats to fish. The quota allocated and the electronic logbooks onboard are evidence of this implementation.		
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.3

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	Skagerrak Sea fisheries have been studied by different institutions over the years. There is relevant information to understand the key elements of the ecosystem and its functions. These key elements include the trophic structure of the Skagerrak ecosystem, such as prey, predators and competitors, community composition, productivity patterns and biodiversity characteristics. ICES reports on stocks assessment also provide relevant information to know the status of the different components of the fishery. For this reason, the team considers that the information is adequate to broadly understand the key elements of the fishery.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Main impacts of the creel fishery have been investigated. Creel fishing has been shown to have no, or very little, disturbance effect on benthic fauna (Eno, et al., 2001). The survival of crustacean discards is also thought to be high (Bergmann and Moore, 2001), one reason why creeling has a light ecological footprint (Ungfors, et al., 2013).		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	The fishery is known to have very little impact on retained, bycatch, and ETP species. Nephrops caught with creels show better condition and bigger size than those captured with other gears. The different components of the ecosystem have been studied on different research programmes and are generally understood. Therefore, the team considers that SG100 is met.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Sufficient information is available on the impacts of the fishery on the components and elements to allow the main consequences for the ecosystem to be inferred. Impacts of the fishery on the ecosystem can be inferred from available information.		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	The team considers that information is sufficient to support the development of strategies to manage ecosystem impacts. Besides that, sufficient data continue to be collected through various organizations. Data are routinely collected on an ongoing basis to allow for the detection of any change or increase in risk level to the main ecosystem components. ICES Mixed fisheries advice report for the North Sea (2013) (which includes Skagerrak), gives an overview of the stocks of different species and marks a path towards ecosystem management. This advice indicates that sufficient data are collected to support the development of strategies to manage ecosystem impacts.		
References		» Annual report for the Swedish National Programme for collection of fisheries data 2012. Swedish Agency for Marine and Water Management. https://www.havochvatten.se/download/18.2a9b232013c3e8ee03e7a3f/1364904967368/Sweden_NP_Proposal_2011-2013_Text_26-Mar-2013.pdf » Bergmann & Moore, 2001. Survival of decapod crustaceans discarded in the nephrops fishery of the Clyde Sea area, Scotland. ICES Journal of Marine Science, 58. http://icesjms.oxfordjournals.org/content/58/1/163.full.pdf		

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
	» Eno, N. C., Mac Donald, S. D., Kinnear, J. A. M., Amos, C. S., Chapman, C. J., Clark, R. A., Bunker, F. St. P. D. and Munro, C., 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58, 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.abstract » ICES Mixed fisheries advice for the North Sea (2013). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/mix-nsea.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Kinnear, J.A.M. et al. 1996. Effects of nephrops creels on the environment. Fisheries research Services, report 2/96. http://www.scotland.gov.uk/Uploads/Documents/frsr296.pdf » Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp. http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	**N/A**

UoC 6 Kattegat Creel

Evaluation Table for PI 2.1.1

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	Y
	Justification	Catch composition for the Swedish creels fishing in the Kattegat Sea. Data have been obtained from the STECF 2012 database. Species in bold in green shaded cells represent main retained species.		

STECF 2012 data. Swedish creels in the Kattegat Sea.			
FAO code	**Species**	**Landings (Tonnes)**	**% catch**
CRE	**Edible crab**	6,95	45,10
NEP	Nephrops	8,46	54,90
TOTAL		15,41	100

Contrary to the Skagerrak record on catch composition for the creel fishery, Kattegat records show crab as the only retained species of the fishery (representing 45% of the catch composition).

There is a high degree of certainty that crab abundance is high (T. Jansson Maser Thesis 2008, and Annete Ungfors Doctoral Thesis 2008). The suitable crab habitat combined with the density estimates from Fjällbacka would indicate that the catchable population of crabs on the Swedish west coast would be approximately 10-22 million (95 % confidence interval) crabs. The stock biomass of edible crabs available for the Swedish fishermen in Kattegat and Skagerrak is estimated to 4-8 million edible crab or 1600-2600 tonnes. Besides, Fishing mortality is low and no trend (decreasing or increasing) in logbooks landing per unit effort (LPUE) can been seen over the last 13 years. Therefore, a SG100 is given.

b	**Guidepost**			Target reference points are defined for retained species.
	Met?			N
	Justification	There is no ICES advice nor reference points for crab.		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The team considers that the use of the creel avoids the catch of retained species and bycatch, so it considers the use of the creel as a strategy that ensures that the fishery does not hinder the recovery and rebuilding of other species. Besides that, crab is not considered to be outside biological limits.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	Even though the knowledge of crab could be deeper, the team considers that quota restrictions and vessel licenses should prevent the fishery from damaging retained species.		
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors, A. Doctoral Thesis (2008) "Fisheries biology of the edible crab (*Cancer pagurus*) in the Kattegat and the Skagerrak. Implications for sustainable management", http://www.gu.se/forskning/publikation/?publicationId=112249 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282.		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.2

PI 2.1.2		**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y
	Justification	There are specific limitations for the creel fishery that limit the exploitation rate of crabs such as the number of creels per boat (800 creels for boats with one fisherman and 1400 creels for boats with two fishermen). Creels must be set at depths deeper than 30m. Vessels participating in the creel fishery normally vary from 5 -12.7m length, being most of them at the 8-10 m interval. 25 % of total Swedish quota is allocated to the creel fishery (341 Tonnes, both for Skagerrak and Kattegat). (Ungfors, 2013). Vessels over 10m are obliged to report retained species in the logbook daily, and, if under 10 m, monthly. These limitations on the creel fishery can be seen as a strategy to manage retained species, therefore a SG100 is given. The exhaustive record of catch composition at STECF website and the low quantity of catch for this UoC also supports the SG100.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	Crab abundance and the low catch of this UoC give confidence on the effectiveness of the strategy.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
	Met?		Y	Y
	Justification	Specific limitations for the creel fishery which limit the exploitation rate of crabs are implemented successfully, since the creel fishery is under the Swedish Fisheries Administration, and is subject to inspections and the accomplishment of Swedish regulations.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	As there is no evidence or record on the effects of the fishery on the crab population SG100 can´t be reached.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282.		

PI 2.1.2	**There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species**
	» Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.1.3

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Qualitative and quantitative information is being recorded by SWAMN and SLU observers for some years. There are also records available at the STECF database. But latest observer reports provides data from 2005 (Jansson, 2008), so the team considers that this limited observer data prevents the fishery from achieving SG100.All species reach a SG80.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The team considers that information is not enough to quantitatively estimate outcome status for crab.		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	The team considers that information is sufficient to support a strategy to manage retained species, based on logbook and landings data.		

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y
	Justification	Data on retained species are recorded in logbooks. The only retained species in this UoC is crab with 45% of landings (6 tonnes). The team considers that monitoring is conducted in sufficient detail (as STECF records for the Skagerrak shows), but the small catch of the fishery prevent any significant catch of any other retained species.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567 http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 . » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.		

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.1

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	STEFC database show no bycatch for this fishery. Nonetheless, data from research and trials in the creel fishery show the following catch composition: 90 % of nephrops (of which 75% are above MLV and 15% under MLS, therefore, discarded), and a 10% of miscellanea fish which are discarded. Both undersized nephrops and the various fish (of which many are poor cod *Trisopterus minutus*) are discarded at the point of capture with a very high survival rate, as the animals don´t get harmed during their interaction with the creel. But the lack of data on the miscellaneous fish caught by the creels makes it difficult to reach a SG100. All species reach a SG80.		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	The use of the creels is seen by the team as an effective strategy to avoid the catch of retained species or bycatch. All species reach a SG80.		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups
	Justification	As said before, there´s a proportion of bycatch which has not been identified, as report only shows "miscellanea fish" for a group of them. But the team considers that the creel fishery does not hinder the recovery of bycatch or retained species. All species reach a SG60.
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES June 2013. Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Bergmann & Moore, 2001. Survival of decapod crustaceans discarded in the Nephrops fishery on the Clyde Sea area, Scotland. http://icesjms.oxfordjournals.org/content/58/1/163.full.pdf » STECF Data Collection Framework. http://stecf.jrc.ec.europa.eu/data-reports 2013 App 08 landings by rectangle by country.xlsx » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.2

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	The team considers that the use of the creel and its management can be seen as a strategy for managing and minimizing bycatch. As the number of creels is limited by vessel, the data collected in logbooks, there´s a quota allocated to the fishery, and a high survival rate of discards, therefore the UoC reaches a SG100 for all species.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	The creel fishery has been under research to certify its low impact on the environment. Fishermen and scientists claim that nephrops caught with creel are alive and present much better condition, as they are not harmed during the process. Due to the benign nature of the capture process, it is expected that the mortality of fish discarded from traps may be low as the catch is usually alive, with low injury rates. Experiment with passive gears such as fish pots, hand lines and fyke nets showed that 90% of the cod were viable for tagging and release. (Nøstvik and Pedersen, 1999). Therefore, it can be concluded that bycatch shouldn´t be harmed either. All species reach a SG100.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
	Met?		Y	Y
	Justification	Fishermen's traditional behaviour regarding bycatch has been to release this catch immediately on hauling the creels so that survival can be maximised. This contributes significantly to the success of the strategy. Therefore, all species reach a SG100.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	The low proportion of observer trips onboard these vessels, as well as their small size, makes it difficult to carry out a comprehensive monitoring of the activities of these vessels in the creel fisheries. SG 100 is not met.		
References		» Council Regulation 1342/2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » ICES June 2013. Advice for cod in the Kattegat. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/cod-kat.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Nøstvik, F and Pedersen, T. 1999. Catching cod for tagging experiments. Fish. Res. 42: 57-66. http://www.sciencedirect.com/science/article/pii/S0165783699000375 » STECF Data Collection Framework. http://stecf.jrc.ec.europa.eu/data-reports 2013 App 08 landings by rectangle by country.xlsx » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		

PI 2.2.2	**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.2.3

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	Research on creels is a source of qualitative and quantitative information on the amount of bycatch species taken by the fishery. But that is not enough to assert that there is information on all bycatch species and that the information is verifiable. All species reach a SG80. Investigations into Nephrops creel fisheries are limited to the Scottish west coast, where fish bycatch varies seasonally and includes poor cod, and more occasionally cod, haddock, whiting, conger eel, and ling. Other crustaceans, starfish and gastropods also feature in catches. This by-catch is largely discarded, and survival is generally considered to be high. (Phillips, 2006, page 438)		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The lack of information on bycatch composition prevents this fishery from achieving a SG100. Information is not accurate, but the team considers that it is sufficient to estimate outcome status, due to the small proportion of bycatch. In 2005–2006, an observer survey in the Swedish creel fishery (Jansson, 2008; more than 12,000 creels recorded for 26 vessels) found that on average 75% of the capture by weight consisted of the targeted Nephrops, 15% of under-sized Nephrops (under 40-mm CL) and 10% of fish such as cod and poor cod (*Trisopterus minutus*). (Ungfors et al. 2013). All species reach a SG80.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
	Justification	The low proportion of bycatch and the high rate of survival leads to the high degree of certainty of the effectiveness of the strategy, but the lack of information on which species comprise the bycatch of this fishery prevents it from scoring SG100. Therefore, a SG80 is given for all species.		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	N
	Justification	Data are collected through SLU and other organizations, but this monitoring is not conducted often enough to assess ongoing mortalities to all bycatch species, as the last report to which the team had access is from year 2005 (Jansson, 2008). All species reach a SG80.		
References		» Phillips, B. (Editor). Lobsters: Biology, management, aquaculture and fisheries. 2006 (Page 438). http://books.google.es/books?hl=en&lr=&id=Hp6otrU_y0QC&oi=fnd&pg=PA1982&dq=Lobsters:+Biology,+management,+aquaculture+and+fisheries.+2006&ots=9prvHi995Z&sig=MFK80wmNF9D5jrb0HfW3HvmH6l4#v=onepage&q=Lobsters%3A%20Biology%2C%20management%2C%20aquaculture%20and%20fisheries.%202006&f=false » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497.		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.1

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	Y
	Justification	As reported in other UoC´s, the main ETP species in the area would be common skate, basking, angel and white sharks, giant manta ray, portbeage and guitarfish (elasmobranchii) and harbor porpoise (cetacea). The team does not expect the effects of this fishery to be within the limits for protection for these species.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N
	Justification	Information in the area is scant, but the only expected effects would be scratches on the animal skin, which obviously are direct effects but are not considered to create unacceptable impacts on these species.		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y
	Justification	The team considers that there Are no significant detrimental indirect effects of the creel fishery on these species, such as it would be the depletion of the prey or changes on the trophic webs in the area.		
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf		

PI 2.3.1	**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**
	» Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Northridge, S. An updated world review of interactions between marine mammals and fisheries. FAO fisheries technical paper, 251. http://www.fao.org/docrep/003/t0452e/t0452e00.htm » OSPAR Commission 2010. Background Document for Spurdog or Spiny dogfish Squalus acanthias. http://qsr2010.ospar.org/media/assessments/Species/P00470_spurdog.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.2

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimize mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimize mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	Y

	Justification	There are measures that are designed to manage impacts of commercial fisheries on ETP species specifically. There is also regulatory protection of ETP species and records on the ETP species caught. There is an Action Plans for Threatened Species of Fish and Shell (Finfo 2007:7). All these measures are considered to constitute a comprehensive strategy to manage ETP These measures include: a) Annual EU fishing opportunities regulations. 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. The implication of this is that all common skate or 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. b) 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 set out limits for fishing effort by mobile gears according to mesh size used (TR1, TR2) c) 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*." d) 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. e) 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.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument	There is an objective basis for confidence that the strategy will work, based on	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
		(e.g., general experience, theory or comparison with similar fisheries/species).	information directly about the fishery and/or the species involved.	supports high confidence that the strategy will work.
	Met?	Y	Y	Y
	Justification	The team concludes that there is an objective basis for confidence that the strategy will work, as there is a high number of measures, a strict effort control, and a code of conduct establishing steps to take in the event of interactions with ETP species. ETP species in the area have been sampled in Sweden since 2005. For all the above reasons, the team concludes there is a high confidence that the strategy will work. Besides, the creels are not expected to cause irreversible harm on the ETP species considered.		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	Finfo 2007:7 strategy is implemented since 2007, but the team could not ascertain if all elements of the strategy were fully implemented. The lack of direct data from this fishery makes it difficult to check if all the elements of the strategy are successfully implemented. The use of acoustic deterrent devices would help in achieving this goal.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	As there is no clear evidence yet of the strategy being successfully implemented, there can´t be evidence of it achieving its objective. The team hasn´t found evidence nor records of interactions between this UoC and the ETP species, which could mean that there are no interactions or that these are not recorded.		
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf		

PI 2.3.2	**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
	» Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.3.3

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The team considers that there is sufficient information to quantitatively estimate the impacts of the creel fishery on ETP species, but the lack of records of interactions for this UoC weakens the certainty of these estimations and prevents the fishery from achieving the SG100.		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	The team considers that the available information is sufficient to determine whether the fishery may be a threat to the protection of ETP species, but is not enough to quantify all impacts or injuries that ETP species may suffer due to the creels.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	Y

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	The team considers that the available information should be sufficient to support a comprehensive strategy to minimize the impacts and injuries of the creel fishery on ETP species.
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497
OVERALL PERFORMANCE INDICATOR SCORE:		**85**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	Eno et al (2001) studied impacts of trap fishing on emergent fauna (sponges, bryozoans, ascidians, soft corals and tube worms) at three sites off the British Isles, concluding that impacts were generally low. Soft, erect fauna (sea pens) tended to bend in response to the pressure wave. Impacts on other emergent fauna were limited. More information can be found on the Workshop on effects of fishing gear on marine habitats in the north-eastern US (NEFMC 2002) which concluded that the degree of impact caused by pots and traps to biological and physical structure and to benthic species in mud, sand and gravel habitats was low. The primary direct impacts of any kind of pot are the scouring of the bottom and injury or death to benthic organisms that occur directly under the pot. The panel concluded that the degree of impact caused by pots and traps to biological and physical structure and to benthic prey in mud, sand and gravel habitats was low. Research on the habitat impacts of the creel fishery show a very small proportion of seafloor impacted. The entire west coast creel fishery, landing 20% of the total lobster catch, affected the same seafloor area as did 1 hour of trawling (Ziegler & Valentinsson, 2008). Also, seafloor disturbance caused by creels can be considered to be much less harmful to the habitat that the majority of fishing gears. It is considered that the creels don´t cause irreversible harm to the habitat.		
References		» Eno, N. C., Mac Donald, S. D., Kinnear, J. A. M., Amos, C. S., Chapman, C. J., Clark, R. A., Bunker, F. St. P. D. and Munro, C., 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58, 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.full.pdf+html » Kinnear, J.A.M. et al. 1996. Effects of nephrops creels on the environment. Fisheries research Services, report 2/96. » NEFMC 2002. Workshop on the effects of fishing gear on marine habitats off the north eastern United States, October 23-25, 2001, Boston, Massachusetts. Northeast Fish. Sci. Cent. Ref. Doc 02- 01: 86 pp. (Northeast Region Essential Fish Habitat Steering Committee) http://nefsc.noaa.gov/publications/crd/crd0201/crd0201.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.2

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Kattegat is a studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). There are also different proposals for conservation sites by NGO´s. The Evaluation of closed areas in Kattegat reports that several closed areas were established in 2009 in the northern part of the Sound with the aim to protect local cod population, as it was seen that those areas were nursering areas for the cod. These areas include: » Permanently closed area closed for all fisheries, including recreational fisheries. » Partially closed areas closed for all fisheries in the period 1st January to 31st March. Fisheries with selective gears are allowed to fish here from 1st April to 31st December. » Bigger seasonally closed area closed from the 1st January to 31st March, except for fisheries with selective gears. The team considers that this is a strategy in place for managing the impact of the fishery on habitat types.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Justification	Swedish control 2009-2011 reported a total of 27 inspections at sea which resulted in two infringements. But air surveillance resulted in 22 reported infringements. All infringements were detected in the permanently closed area. (Evaluation of closed areas in the Kattegat, page 3). This area is very sensitive for the recovery of the cod. Management of the closed areas in Kattegat seems to be established, but there are still infringements. Other habitats subject to protection are the Natura2000 sites in the Kattegat (such as Anholt, Stradenge pa laeso og havet syd herfor, Havetomkring nordre runner, Laesotrindel og tonneberg banke, Kims top og den kinesiske mur, Fladen, Lilla middelgrund, Stora middelgrund och rode bank, Lysegrund, Hesselo, Morups bank). Due to the small size of the fishery, and the minimum impacts demonstrated, the team considers that there is some objective basis for confidence that this strategy will work, but management measures need to be implemented in these areas in order to achieve a high confidence in its effectiveness.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The establishment of these protected areas is considered as evidence of the success of the implementation of this strategy, but the lack of defined management measures and enforcement in Natura 2000 sites, prevents the fishery from achieving a SG100. The number of creels each vessel can drop is regulated, and there are also regulations regarding the areas of the fishery. (Ungfors, 2013). This can be considered as measures to limit the plausible harm that the fishery could cause to the habitat. The difficulty to carry on enforcement measures also contributes to the failure of SG100.		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			N
	Justification	The team considers that there is no evidence that the strategy is achieving its objective of not posing a risk of serious or irreversible harm to habitats types, as there is still the need of implementation of management measures in some areas.		
References		» Board of Fisheries regulations (FIFS 2004:36) on fishing in the Skagerrak, Kattegat and Baltic Sea https://www.havochvatten.se/miljopolitik-och-lagar/lagstiftning/svensk-lagstiftning/havs--och-vattenmyndighetens-forfattningssamling/register/fiskeriverkets-foreskrifter-fifs-200436-om-fiske-i-skagerrak-kattegatt-och-ostersjon.html		

PI 2.4.2	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
	» Council Regulation 1342/2008. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0020:0033:EN:PDF » Eno, N. C., Mac Donald, S. D., Kinnear, J. A. M., Amos, C. S., Chapman, C. J., Clark, R. A., Bunker, F. St. P. D. and Munro, C., 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58, 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.abstract » Fish and benthic environment at the Swedish west coast, 2004-2009: Effects of jet boundary relocation and other fishing regulations. Fiskeriverter informerar. F-info 2011:6 https://www.havochvatten.se/download/18.64f5b3211343cffddb2800012608/1348912838177/finfo2011_6.pdf » http://natura2000.eea.europa.eu/# » http://www.naturstyrelsen.dk/Naturbeskyttelse/Natura2000/Natura_2000_planer/Se_Planerne/001_125/ » http://projektwebbar.lansstyrelsen.se/kosterhavet/Sv/Pages/default.aspx » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » SwAMN. Evaluation of closed areas in Kattegat to promote the rebuilding of the cod stock. https://www.havochvatten.se/download/18.b62dc9d13823fbe78c8000237/Summary+Evaluation+of+Closed+Areas+in+Kattegat.pdf……
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.4.3

PI 2.4.3		**Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	Kattegat Sea has been very well studied over the years and there are numerous studies and high resolution maps on the distribution of all main habitats types.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	The team considers that there is enough information to identify the nature of the impacts and spatial and temporal interaction are recorded in logbooks. Creel fishing has shown to have no, or very little, disturbance effect on benthic fauna (Eno, et al., 2001). However, these impacts have not yet being quantified fully in the area.		
c	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Justification	The team considers that sufficient data are not being collected, as spatial extent of the habitat affected by the creel fishery is not known due to the lack of vessel monitoring system onboard. However, spatial information is recorded in logbooks. Days at sea and vessel quotas are also monitored on an ongoing basis and these data are available for assessing the scale of risk to habitat on an ongoing basis. Considering this, knowing total licenses creel vessels could be sufficient to determine increase in risks to Habitat outcome. 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 closed areas and Natura 2000) are being undertaken and will be required to continue into the future under the Habitats Directive and under commitments to OSPAR. The NOVANA Programme is responsible for monitoring habitat distributions and characteristics. There is also a great involvement of different NGO´s in the study of these habitats.
References		» ICES WGMHM REPORT 2009: Report of the Working Group on Marine Habitat Mapping. http://www.aquabiota.se/publikationersveng/pdf/wgmhm09.pdf » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Leocadio AM, Whitmarsh D, Castro M (2012) Comparing Trawl and Creel Fishing for Norway Lobster (*Nephrops norvegicus*): Biological and Economic Considerations. PLoS ONE 7(7): e39567. doi:10.1371/journal.pone.0039567. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039567 » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Evaluation Table for PI 2.5.1

PI 2.5.1		**The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	Main impacts of the creel fishery have been investigated. Creel fishing has been shown to have no, or very little, disturbance effect on benthic fauna (Eno, et al., 2001). They are considered highly unlikely to disrupt the key elements underlying ecosystem structure and function, or cause irreversible harm to the ecosystem, due to its small seafloor disturbance, its small proportion of bycatch, the high rate of discard survival, and the absence of interactions with ETP species.		
References		» Eno, N. C., Mac Donald, S. D., Kinnear, J. A. M., Amos, C. S., Chapman, C. J., Clark, R. A., Bunker, F. St. P. D. and Munro, C., 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58, 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.abstract » Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Kinnear, J.A.M. et al. 1996. Effects of nephrops creels on the environment. Fisheries research Services, report 2/96. http://www.scotland.gov.uk/Uploads/Documents/frsr296.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/A**

Evaluation Table for PI 2.5.2

PI 2.5.2		**There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	Y
	Justification	The team considers that there is a strategy to protect the Kattegat ecosystem, focused on the recovery of the cod stock. Measures in place, such as the quota assigned, the use of selective gears such as creels, the licensing of vessels, the closed areas, the cod recovery plan, the enforcement effort, the collaboration between the Swedish and Danish fisheries agencies, and the establishment of Natura 2000 sites, can be seen as a planned strategy. Creel vessels over 10m are obliged to report retained species in the logbook daily, and, if under 10 m, monthly.		
b	**Guidepost**	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	EU fisheries should address the precautionary and ecosystem approach in their management to facilitate the long-term sustainability of fish stocks (EC Fisheries 2006). To help co-ordinate the provision of scientific advice on marine ecosystems, and research on the ecosystem effects of exploitation of marine resources in North Western Europe and the eastern Atlantic, ICES formed the Advisory Committee on Ecosystems (ACE). Furthermore legislation is in place to protect species and habitats under the Habitats and Birds Directives, OSPAR, BONN Convention (including ASCOBANS), BERN Convention and CITES as well as various EC fisheries regulations and Norway-EU agreements. It is therefore assessed that there are a series of measures in place that constitute a strategy to address impacts on the ecosystem. But this strategy is highly focused on the recovery of cod and does not pay the same attention to other impacts, therefore, SG100 is not met.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	Y
	Justification	The team considers that besides the lack of complete information of the creel fishery position, the measures in place such as the quota allocated, the licensing of the vessels and the return to the sea of discards should minimize the harm to the ecosystem.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	Y
	Justification	These measures are being implemented successfully, as licenses are necessary in order for the boats to fish. The quota allocated and the electronic logbooks onboard are evidence of this implementation.		
References		» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 2.5.3

PI 2.5.3		**There is adequate knowledge of the impacts of the fishery on the ecosystem**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	Kattegat ecosystem has been studied by different institutions over the years. There is relevant information to understand the key elements of the ecosystem and its functions. These key elements include the trophic structure of the Kattegat ecosystem, such as prey, predators and competitors, community composition, productivity patterns and biodiversity characteristics. ICES reports on stocks assessment also provide relevant information to know the status of the different components of the fishery. For these reasons, the team considers that the information is adequate to broadly understand the key elements of the fishery.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Main impacts of the creel fishery have been investigated. Creel fishing has been shown to have no, or very little, disturbance effect on benthic fauna (Eno, et al., 2001). The survival of crustacean discards is also thought to be high (Bergmann and Moore, 2001), one reason why creeling has a light ecological footprint (Ungfors, et al., 2013).		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
	Justification	The fishery is known to have very little impact on retained, bycatch, and ETP species. Nephrops caught with creels show better condition and bigger size than those captured with other gears. The different components of the ecosystem have been studied on different research programmes and are generally understood. Therefore, the team considers that SG100 is met.		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	Sufficient information is available on the impacts of the fishery on the components and elements to allow the main consequences for the ecosystem to be inferred. Impacts of the fishery on the ecosystem can be inferred from available information.		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	N
	Justification	Sufficient data continue to be collected through various organizations. Data are routinely collected on an ongoing basis to allow for the detection of any change or increase in risk level to the main ecosystem components. But advice on mixed fisheries in the Kattegat or more information on the crab status would increase the available information for supporting the development of strategies to manage ecosystem impacts.		
References		» Annual report for the Swedish National Programme for collection of fisheries data 2012. Swedish Agency for Marine and Water Management. https://www.havochvatten.se/download/18.2a9b232013c3e8ee03e7a3f/1364904967368/Sweden_NP_Proposal_2011-2013_Text_26-Mar-2013.pdf » Bergmann & Moore, 2001. Survival of decapod crustaceans discarded in the nephrops fishery of the Clyde Sea area, Scotland. ICES Journal of Marine Science, 58. http://icesjms.oxfordjournals.org/content/58/1/163.full.pdf » Eno, N. C., Mac Donald, S. D., Kinnear, J. A. M., Amos, C. S., Chapman, C. J., Clark, R. A., Bunker, F. St. P. D. and Munro, C., 2001. Effects of crustacean traps on benthic fauna. ICES J. Mar. Sci. 58, 11-20. http://icesjms.oxfordjournals.org/content/58/1/11.abstract		

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
	» Jansson, T. 2008. Discards in the Swedish creel fishery for *Nephrops norvegicus*. Master Thesis. http://www.gu.se/digitalAssets/1192/1192393_discards_creel_fishery_tj.pdf » Kinnear, J.A.M. et al. 1996. Effects of nephrops creels on the environment. Fisheries research Services, report 2/96. http://www.scotland.gov.uk/Uploads/Documents/frsr296.pdf » Mackinson, S. and Daskalov, G., 2007. An ecosystem model of the North Sea to support an ecosystem approach to fisheries management: description and parameterisation. Sci. Ser. Tech Rep., Cefas Lowestoft, 142: 196pp. http://www.cefas.defra.gov.uk/publications/techrep/tech142.pdf » Ungfors et al., 2013. Advances in marine biology: The ecology and biology of *Nephrops norvegicus*. Volume n.64. 276-282. » Ziegler, F., Valentinsson, D. Environmental life cycle assessment of Norway lobster (*Nephrops norvegicus*) caught along the Swedish west coast by creels and conventional trawls—LCA methodology with case study. Int J Life Cycle Assess (2008) 13:487–497
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**N/A**

Principle 3: All UoCs

Evaluation Table for PI 3.1.1

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	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 Underneath 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 Swedish law by the Swedish Fisheries Code (1993:787), 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.		
b	**Guidepost**	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	Y	Y	Y

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
	Justification	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 Sweden, SWAM act proactively with the industry to discuss management proposals, and address industry concerns. *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 Swedish judicial system. In event of a fisheries infringement SWAM 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 Sweden 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 dispute between the EU and Faroe Islands relating to mackerel catches. However *"within the context of this fishery",* this scoring indicator can be considered to be met as Norway's share of the IIIa Nephrops TAC is agreed annually.		
d	**Guidepost**	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	N

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**
	Justification	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." The Swedish fisheries code observes, but does not explicitly consider the rights of fishing communities beyond recognizing specific private fishing rights in certain areas and therefore SG100 is not met.
References		» 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. » http://www.nsrac.org/category/nsrac-working-groups/demersal-nsrac-working-groups/ » Law on EU regulations and the Common Fisheries Policy (Lag om EG:s förordningar och den gemensamma fiskeripolitiken), SFS 1994:1709 » Swedish Code of Statutes (Fiskerilagen 1993), SFS1993:787 » Swedish National Strategic Plan for the fisheries sector 2007-2013 (in accordance with EC reg. no 1198/2006)

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.1.2

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	Y
	Justification	Key organisations in the management of Swedish Fisheries are known, as are those involved in aquaculture permitting at a national, provincial and local level. Section 3.3 of this assessment report provides a description of the key roles and responsibility in the fishery management process. Briefly, these include: » Management / administration: EU DG Mare, Swedish Ministry of Agriculture and Swedish Board of Fisheries (SBF),(Fiskeriverket) and Swedish Board of Agriculture (for aquaculture) » Scientific Advice: ICES, EU's STECF & ACOM, SBF (Department for Development and Research). » Control & Enforcement: EU Community Fisheries Control Agency (CFCA), SBF, Swedish Coast Guard. » Industry Representation: Swedish Fishermen's Federation (SFR), Federation of Swedish Fish Industries (FR) and for this fishery the Swedish Shellfish Producer Organisation (SSPO) 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.		
b	**Guidepost**	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	N

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
	Justification	The EU-level management system is informed by extensive consultation with Member States and wider stakeholders for key regulatory developments such as CFP reform (every 10 years). The Green paper on the reform of the CFP (EC, 2009) 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 Swedish Government and industry and other interested parties have actively taken up the opportunity to respond, National strategies and action plans are developed by SWAM, the Swedish management authority involving a range of stakeholders in extensive consultation. These can add further management to requirements under EU legislation. The management system (CFP) is developed by the Commission (and adopted by Sweden in its own legislation), accepting relevant information, including local information gathered by Member States, but it does not always explain how this is used or not used and therefore SG100 is not met.		
c	**Guidepost**		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	N
	Justification	There is opportunity for all interested and affected parties to be involved in consultations on regulatory developments in fisheries, but certain stakeholders (e.g. green NGOs commenting during consultation) are not always encouraged to engage in the process therefore the SG100 is not met.		
References		» COM (2009)163 final. GREEN PAPER. Reform of the Common Fisheries Policy » http://ec.europa.eu/fisheries/reform/consultation/received/indexen.htm » In-depth views on the CFP-reform 2012 – contribution from the Swedish Government. Ministry of Agriculture (Regeringskansliet) July 2010.		

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

Evaluation Table for PI 3.1.3

PI 3.1.3		**The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	Y

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach
	Justification	*Clear long-term objectives ..... are explicit within and required by management policy.* 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. 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. Article 15 of Council Regulation EC 1198/2006 on the European Fisheries Fund, requires that all member states: "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: » 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; » the sustainable development of fisheries areas, » preserving human resources in the fisheries sector, through upgrading professional skills, securing » sustainable employment and enhancing the position and role of women; » protection and enhancement of the aquatic environment related to the fisheries sector". The Swedish Ministry of Agriculture has complied with the requirements of the above regulation in the 'National Strategic Plan for the Swedish Fishing Industry 2007-2013'. This clearly sets out the national long term objectives: » achieve set environmental objectives by means of an eco-system-based approach in management » develop rural areas and create and maintain employment » improve the profitability of enterprises in the fisheries sector » increase understanding, knowledge and experience exchange » have well-informed consumers Long term objectives are in place to guide decision-making. Fisheries Management and aquaculture planning policy in Sweden are underpinned by the Environmental Code, which is an explicit requirement of Swedish ordinances.
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. Official Journal of the European Union L 358, 59-80. » COUNCIL REGULATION (EC) No 1198/2006. On the European Fisheries

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach
	Fund » Swedish National Strategic Plan for the fisheries sector 2007-2013 (in accordance with EC reg. no 1198/2006) » The Environmental Code, 1998
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.1.4

PI 3.1.4		**The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	Partial

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
	Justification	There are some minor forms of subsidy, which could be identified for this fishery. However, these do not contribute to unsustainable fishing and are consistent with MSC principles 1 and 2. These are: » The industry does not pay directly for management or science (although this is funded through taxation) which could be construed as effective subsidy. » 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 any other economic block in the world (with the exception of Japan). » The EC's structural funding mechanisms to the fishery sector –the European Fisheries Fund (EFF) – provides targeted financial support to the sector, but funding restrictions have been significantly tightened (focus on improvements in safety and environmental impact). The main mechanism for providing incentives via funding to the industry in Sweden 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. No perverse incentives or subsides, which contribute to unsustainable fishing practices have been identified. The ability to pool vessel quotas has reduced quota shortage and related discards previously not uncommon in the mixed demersal fisheries in the Kattegat and Skagerrak. » The Days at Sea scheme operated under the Cod Recovery Plan provides some extra fishing effort to vessels adopting more selective fishing gears. The Nephrops fishery operates under the cod recovery plan, which is regularly reviewed, however the management system does not explicitly consider incentives in this review and therefore a partial score at SG100 is given.
References		» COUNCIL REGULATION (EC) No 1198/2006. On the European Fisheries Fund » COUNCIL REGULATION (EC) No 1342/2008. Establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. » COMMISSION REGULATION (EC) No 498/2007. Laying down detailed rules for the implementation of Council Regulation (EC) No1198/2006 on the European Fisheries Fund

OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.1

PI 3.2.1		**The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
	Met?	Y	Y	Partial
	Justification	The MSY approach is informing TAC levels set (see Principle 1), including discards,, but the basis of harvest rate calculation has varied so may not be considered 'well-defined, but measurable and these are demonstrably consistent with P1 outcomes so SG100 partially met. For P2 outcomes objectives which are well-defined and measureable are currently set in relation to retained species (quota) and spatial management. While there are objectives to reduce bycatch, prior to the planned landing obligation these are yet to be well defined and measurable therefore SG100 is partially met.		
References		» Common Fisheries Policy: http://ec.europa.eu/fisheries/cfp / » Swedish Code of Statutes 1994:1716		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 3.2.2

PI 3.2.2		**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	Decision-making is at EU level (ICES, STECF and EC Fisheries Council) 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). The final decision is by 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). However this does not always *'result in measures and strategies to achieve specific fisheries objectives',* as TACs or similar measures have been agreed that greatly exceed those advised. However, it is almost increasingly difficult for Ministers to ignore firm scientific advice, and this has not been a significant issue in the IIIa Nephrops fishery guided by advice for a single functional unit.		
b	**Guidepost**	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	N

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
	Justification	The 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, not all issues identified in research are fully addressed. In particular some of the P2 criteria, including habitats and ETP species receive less consideration in a timely, adaptive and transparent manner therefore the SG100 is not met.		
c	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	Advice from ICES on the Nephrops assessment uses the precautionary approach. Information provided to, and used by ICES is the best available.		
d	Guidepost	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	N
	Justification	The system for transparent explanation of decision-making and resulting actions stops short of being *'formal reporting to all interested stakeholders'* 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 has the ability to make decisions about management of the fishery, and very little transparent explanation is available at this level.		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
e	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	N
	Justification	There are a number of mechanisms in management of the Nephrops fishery to avoid legal disputes, and these are much improved in recent years. 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. Stakeholder consultation through Regional Advisory Councils (RAC) is now an integral part of the functioning of this system. For the Nephrops fishery under assessment the North Sea RAC plays an important role in bringing parties together (industry – across all sectors, science, NGO) early on in the management process, thereby reducing the likelihood of management measures which trigger dispute. Additionally SwAM act proactively with the industry to discuss management proposals, and address industry concerns. There are regular meetings between the industry and the ministry to avoid subsequent challenges, however there was no (?) evidence provided of the rapid implementation of judicial decisions arising from legal challenges and therefore the SG100 is not met.		
References		» 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. » COMMISSION DECISION (2004/864/EC). Amending Commission Decision 1999/478/EC of renewing the Advisory Committee on Fisheries and Aquaculture » COMMISSION DECISION (2005/629/EC). Establishing a Scientific, Technical and Economic Committee for Fisheries » http://europa.eu/institutions/decision-making/index_en.htm		

OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.3

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
	Justification	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). In Sweden the authority responsible for MCS both at sea and on shore is SwAM with regular joint operations and information sharing with the Danish Agrifish Agency in area IIIa. Inspections of the positioning of selectivity devices including the grid are undertaken in port and at sea, with official tags being applied to the gear. The introduction of e-logbooks has facilitated enforcement and compliance. There remain some infringements in the Swedish fishery, with offences mostly relating to logbook infringements.		
b	**Guidepost**	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	N
	Justification	Non-compliance is dealt with through the Swedish criminal justice systems, and using agreed and tested procedures.in event of an infringement being detected, 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 defense against the charge and provides full right of appeal. Within the Swedish fisheries organisations, mechanisms exist to apply sanctions to vessels that break quota allowances (requiring additional quota to be sought), The MCS system enforcing national regulations implementing the CFP, along with some self-regulation by the industry are consistently applied and expected to provide effective deterrence. However this is based on anecdotal information from stakeholders and no evidence has been provided to support this assumption resulting in SG 100 not being met.		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	N
	Justification	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 vessels landing cod (as opposed to other species).		
d	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	The enforcement system makes strategic and coordinated use of e-logbooks, sales notes, VMS, designated ports, landing inspections, advance hailing of landing,, 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.		
References		» 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, (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 1300/2008, (EC) No 1342/2008. » COMMISSION REGULATION (EC) No 1010/2009. Laying down detailed rules for the implementation of Council Regulation (EC) No 1005/2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing » 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		

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

Evaluation Table for PI 3.2.4

PI 3.2.4		**The fishery has a research plan that addresses the information needs of management**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	N
	Justification	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. 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. The Swedish Agency for Marine and Water Management (SwAM) is responsible for the implementation of the Swedish National Programme for the collection of data in the fisheries sector. This contributes to the EC Data Collection Framework (DCF) which evaluates the fisheries sector, i.e. the collection of economic, biological, and global variables (fishery statistics) as well as fishery-independent surveys at sea. As Sweden and Denmark have vessels landing to each other's ports, a bilateral agreement to share biological sampling requirements in accordance with EC Reg. 665/2008 on the DCF. A number of national and bi-lateral projects looking at issues across all 3 MSC principles are ongoing. The findings of these studies contribute to ICES findings. Taken in combination it can be concluded there is therefore a strategic approach, which delivers reliable and timely information. However there is no "*comprehensive research plan to provide the management system with a coherent and strategic approach to research across P1, P2 and P3"* and therefore SG100 is not met.		
b	**Guidepost**	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	Y

PI 3.2.4		The fishery has a research plan that addresses the information needs of management
	Justification	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 and widely and publicly available – The EU Framework research programmes have their own web sites, publish aims, programmes, and it is conditional on EC funding that the results are publicly available in a timely manner. In particular they are disseminated to decision-makers, in time for annual fishery allocation negotiations.
References		» Searchable hub for all ICES expert groups: http://www.ices.dk/workinggroups/WorkingGroups.aspx » National programme and annual reports for data collection https://www.havochvatten.se/en/start/environmental-research/-data-collection-framework/national-programes-and-annual-reports.html » Sweden-Denmark bilateral agreement on biological sampling: https://www.havochvatten.se/download/18.64f5b3211343cffddb2800026521/1348912739227/Agreement_SWE_DEN_2010.pdf
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.2.5

PI 3.2.5		**There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives** **There is effective and timely review of the fishery-specific management system**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	Y
	Justification	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, as well as catch sampling ashore to monitor catch composition. With 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). Well-documented procedures exist to reduce harvest in light of monitoring results. 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: » Annual review of survey information and scientific advice (by ICES and STECF) » Review of the CFP (every 10 years) » Annual Report on Fishing Fleet Capacity in Sweden » Annual report on implementation of the European Fisheries Fund The recent institutional changes that established SwAM as the responsible fisheries body came about from internal review of fishery management systems. The ICES Working Group also effectively serves as routine evaluations of management performance, by comparing fishery performance to pre-determined targets. Environmental management addressing P2 elements is also subject to evaluation via the delivery of the Natura 2000 network. Catch reporting, including discarding and ETP interactions via observers, also enables the evaluation of P2 elements.		
b	**Guidepost**	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	N

PI 3.2.5		**There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives** **There is effective and timely review of the fishery-specific management system**
	Justification	The majority of the evaluations undertaken are 'internal' either within ICES or the EC. 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. The ICES advice (and Nephrops survey methodologies) is therefore regularly internally. STECF also provides occasional external review of the Nephrops management system at the request of the Commission. The Nephrops fisheries do not have formal mechanisms defined for internal and external review (as are laid out in Long Term Management Plans for example) and therefore SG 100 is not met.
References		» STECF review of ICES advice: http://stecf.jrc.ec.europa.eu/reports/review-advice » ICES Working Group on Nephrops Surveys: http://www.ices.dk/community/groups/Pages/WGNEPS.aspx
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		

Appendix 1.2 Risk Based Framework (RBF) Outputs

The RBF was not used in this assessment.

Appendix 1.3 Conditions

There are 3 conditions for this fishery.

P1 conditions

There are 2 Principle 1 conditions:

Condition 1

Performance Indicator	PI 1.1.2 Limit and target reference points are appropriate for the stock
Score	75
Rationale	**SG80b Requirement:** The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. **Rationale:** There is no formally defined limit reference point for the fishery. In other Nephrops fisheries, a MSY Btrigger reference point has been defined based on the time series of biomass estimates from the TV surveys. For the Nephrops fishery in Division IIIa, there is currently too short a time series of biomass estimates from the TV survey to be able to define a limit reference point based on the lowest estimate of Nephrops biomass observed over the time series or the point at which the stock showed signs of stress.
Condition	By the fourth annual surveillance a limit reference point for the Nephrops fishery in Division IIIa should be formally defined.
Milestones	**Annual surveillance 2.** Show written evidence of consultation with the relevant authorities to consider options for defining a limit reference point. **Annual surveillance 3.** Provide evidence that the definition of a suitable limit reference point has been agreed through consultation with the relevant authorities. **Annual surveillance 4.** Implementation of an explicitly defined limit reference point through consultation with the relevant authorities.
Client action plan	Ginneton fully supports the further development and refinement of the ICES MSY framework for Skagerrak and Kattegat Nephrops. When a sufficient data series of the UWTV survey is available, we will encourage and support ICES in adopting a Bmsy trigger (or equivalent) reference point to ensure that the harvest rate is reduced at low stock abundance to avoid an increased risk of impaired recruitment. We will also encourage and support the refinement of the estimation of the target harvest ratio to ensure that the main uncertainties are taken into account. **Year 2**: Ginneton will show evidence of contact with the relevant national/ICES scientists to consider the options for developing a Bmsy trigger and the refinement of the estimation of the target harvest ratio. **Year 3**: Ginneton will show evidence that a Bmsy trigger (or equivalent) reference point has been agreed, and that methods for taking the main uncertainties in the estimation of the target harvest ratio into account have been investigated and agreed where applicable. **Year 4:** Ginneton will show evidence that a Bmsy trigger (or equivalent) reference point and methods for taking the main uncertainties in the estimation of the target harvest ratio into account have been implemented in the ICES advisory framework for this Nephrops unit.
Consultation on condition	The Client will need to consult fully with the relevant authorities e.g. National Government, ICES scientists.

Condition 2

Performance Indicator	PI 1.2.2. There are well defined and effective harvest control rules in place
Score	65
Rationale	**SG80a Requirement:** 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. **Rationale:** SG80a. The key harvest control rule is that the TAC is adjusted annually based on the stock biomass estimate derived from the annual underwater TV surveys and the target harvest ratio equivalent to the Fmsy proxy of Fmax estimated from the yield-per-recruit model. The harvest control rule is designed to ensure that the stock fluctuates around the target reference point which is well above the level at which recruitment would be impaired. However it is not clear what management action would take place to reduce the exploitation rate if the stock biomass estimated from the TV survey or standardised LPUE from the fishery fell significantly towards an implicit limit reference point. The Fmsy proxy framework adopted by the ICES WGNSSK would implicitly reduce the exploitation rate by using a lower target harvest ratio if the burrow density estimate from the TV survey dropped below 0.3 burrows m-2, but this cannot be considered to be an explicit, well-defined harvest control rule as it is not a formally agreed management action. The fishery does not therefore meet the SG80. **SG80b Requirement:** The selection of the harvest control rules takes into account the main uncertainties **Rationale:** SG80b. Whilst the HCR used to adjust the TAC is well-defined, it does not take into account the main uncertainties. The stock biomass estimated from the TV survey incorporates a cumulative bias correction factor, but the HCR does not take into account uncertainty in the estimate of the target harvest ratio equivalent to the Fmsy proxy. Fmax is chosen as a conservative proxy for Fmsy for this fishery, but the whole approach to estimating Fmsy proxies adopted by WGNSSK can be considered as still very much "work in progress", and further development and evaluation of the methodology is required. For example, there are uncertainties underlying growth parameter estimates and the estimate of discard survival. In addition the HCR assumes that the stock biomass at the beginning of the year is the same as the stock biomass estimated from the TV survey in the previous year, and in a declining stock this would overestimate the stock biomass and thus deliver a positively-biased TAC.
Condition	By the fourth annual surveillance well defined harvest control rules should be in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The selection of the harvest control rules should take into account the main uncertainties.
Milestones	**Annual surveillance 2.** Show written evidence of consultation with the relevant authorities to consider options for controlling exploitation rate if limit reference points are approached including taking the main uncertainties into account. **Annual surveillance 3.** Provide evidence that a mechanism for controlling exploitation rate if limit reference points are approached, including taking the main uncertainties into account, has been agreed through consultation with the relevant authorities. **Annual surveillance 4.** Implementation of well-defined harvest control rules including taking the main uncertainties into account through consultation with the relevant authorities.
Client action plan	Ginneton fully supports the further development and refinement of the ICES MSY framework for Skagerrak and Kattegat Nephrops. When a sufficient data series of the UWTV survey is available, we will encourage and support ICES in adopting a Bmsy trigger (or equivalent) reference point to ensure that the harvest rate is reduced at low stock abundance to avoid an increased risk of impaired recruitment. We will also encourage and support the refinement of the estimation of the target harvest ratio to ensure that the main uncertainties are taken into account.

	Year 2: Ginneton will show evidence of contact with the relevant national/ICES scientists to consider the options for developing a Bmsy trigger and the refinement of the estimation of the target harvest ratio. **Year 3**: Ginneton will show evidence that a Bmsy trigger (or equivalent) reference point has been agreed, and that methods for taking the main uncertainties in the estimation of the target harvest ratio into account have been investigated and agreed where applicable. **Year 4:** Ginneton will show evidence that a Bmsy trigger (or equivalent) reference point and methods for taking the main uncertainties in the estimation of the target harvest ratio into account have been implemented in the ICES advisory framework for this Nephrops unit.
Consultation on condition	The Client will need to consult fully with the relevant authorities e.g. National Government, ICES scientists.

P2 conditions

There is one Principle 2 condition:

Condition 3: For UoC 1, 2, 3 and 4.

Performance Indicator	2.4.2 There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
Score	75
Rationale	**SG80b Requirement:** There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved. **Rationale:** There are a numerous number of Natura2000 sites in the Skagerrak and Kattegat Seas. As shown in VMS, Skagens Gren area (Skagerrak Sea) supports a high fishing effort which impacts the seafloor. This area is a Natura 2000 site designated to protect birds and mammals. For the Kattegat Sea, VMS maps show a higher impact of the fisheries in Kims top og den kinesiske mur, Fladen and Lilla middelgrund areas. The regulation of these areas is needed. The Sound area (Kattegat Sea) has been closed to trawling for many years and illustrates that the strategy of spatial management works when implemented. As since 2009 there is an exclusion from the effort regime for vessels fishing with a selective grid (Article 11.2.b, Cod Recovery Plan: The Council may, acting on a Commission proposal and on the basis of the information provided by Member States and the advice of STECF referred to in paragraph 3, exclude certain groups of vessels from the application of the effort regime provided that: the percentage of cod catches as assessed by STECF does not exceed 1,5 % of the total catches for each group of vessels concerned) there can´t be a high confidence in the efficiency of the strategy, as seafloor habitats protection decreases as impacts on the sea floor still occur. Swedish control 2009-2011 reported a total of 27 inspections at Kattegat Sea which resulted in two infringements. But air surveillance resulted in 22 reported infringements. All infringements were detected in the permanently closed area. (Evaluation of closed areas in the Kattegat, page 3). This area is very sensitive for the recovery of the cod. Management of the closed areas in Kattegat seems to be established, but there are still infringements. The fact that selective gears are allowed in the closed areas also hinders the recovery of these habitats. Until management measures are designed and implemented there is no objective basis for confidence that this strategy will work, as at present the strategy is limited to specifying Natura sites which should need more protection but aren´t regulated yet. Management measures need to be implemented in these areas in order to achieve a confidence in the strategy effectiveness.
Condition	By the 4th annual surveillance the client shall demonstrate the implementation of those Natura 2000 management measures designed during the lifetime of the certificate. Moreover, while the design of these measures is fulfilled by the relevant authorities, the

Performance Indicator	2.4.2 There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types
	fishery must implement different measures 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) which may be considered as a partial strategy. The fishery shall also demonstrate due regard to Natura 2000 and capture Nature 2000 management requirements in the fishery partial strategy.
Milestones	**Annual surveillance 1:** Have developed a habitat management partial strategy 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. At fleet level the client must develop a system for annually summarizing and reporting on this data for all certified vessels. **Annual surveillance 2**: Provide evidence of implementation of the habitat management partial strategy developed in year 1. **Annual surveillance 3**: Report to the team on management responses with the aim of reducing impacts on sensitive habitats. **Annual surveillance 4**: Demonstrate implementation of a partial 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.
Client action plan	Ginneton is a very active participant in the process of creating management plans for the designated Natura 2000 areas, and we will continue to do so as these are finalized. Through its own Code of Conduct, Ginneton will have a fleet wide reporting requirements for encounters with sensitive habitats including a visual guide that enables fishermen to distinguish these. Collated positions of encounters are made available to the rest of the fleet to enable future avoidance. **Year 1:** Ginneton will provide evidence that collated habitat encounter reports, implemented Natura 2000 management measures, and any new information on vulnerable habitats in the area are available to the fleet in the form of chart layers so that these areas can be avoided by all vessels. **Year 2 and 3**: Ginneton will show evidence of management responses to reduce or mitigate unacceptable habitat impacts, and of further implementation of the vulnerable habitat avoidance measures. **Year 4**: Ginneton will show evidence that Natura 2000 management measures are implemented in the fishery to the extent that this – along with measures implemented by the fleet itself – will provide confidence that the combined partial strategy for habitats will work.
Consultation on condition	The client will need to consult with the relevant authorities: National Governments, Scientific Institutions and the European Commission.

There are no P2 conditions for UoC5 and UoC6.

There are no P3 conditions.

Appendix 2. Peer Review Reports

Peer Reviewer 1

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**Certification Body Response**
Justification: There are clearly come issues surrounding reference points and harvest controls arising from the very recent adoption of TV survey (with a resulting lack of a time series of data). However, given the state of the stock, harvest rates and the ability to implement both of these management features when sufficient data become available, the recommendation to certify the fishery under P1, with conditions, appears appropriate. The P2 commentary appears somewhat unclear in some places (such as definition of ETP and bycatch species), treatment of dab between different gears and some retained species appear to be of ongoing concern. However, subject to review by the assessment team and rescoring where necessary, sufficient controls and monitoring appear to be in place to merit certification under this Principle. Principle 3 is well addressed through EU and Swedish management, although additional reference to Swedish as well as EU systems may further strengthen the recommendation to certify under P3.		Thank you for your review. The specific points are addressed in relation to the relevant PIs.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**Yes** **No for PI 2.2.2**	**Certification Body Response**
Justification: Most conditions all appear appropriately worded, and will particularly address concerns over Principle 1. The 'Consultation on Conditions' for P1 and PI 2.4.2, however, should show support from Swedish Authorities and/or ICES/EU to ensure the meeting of these conditions. The condition for PI 2.2.2 does not seem to follow the metric of the relevant SG80 and should be reviewed – i.e. how much lower a discard ratio would be sufficient? Harmonisation of scoring with Swedish and Danish SELTRA gear should also be considered.		Condition for PI 2.2.2 (UoC2) is now lifted after harmonisation in dab consideration between the different UoCs.

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**Yes**	**Certification Body Response**
Justification: *Yes, subject to appropriate support from Swedish Authorities and/or ICES/EU. Any changes to PI 2.2.2 from comments above should be reflected in Action Plan, of course.*		The client is required to confirm development of the Client Action Plan which has involved consultation and agreement with the relevant parties.

General Comments on the Assessment Report (optional)

The report would benefit from a fuller explanation of the target reference points (Fmax, F0.1, F35%spr).

FCI Response: Additional explanatory text has been included in the background information (section 3.3.2).

There should be clearer separation in the main text of the effects of different gears – esp SELTRA vs grid and the P2 text for retained species would benefit from clearer separation between Skagerrak and Kattegat stocks/areas.

FCI Response: Additional explanatory text has been included in the background information (sections 3.2.2 and 3.4.1.4).

It is not immediately clear why PI 2.2.2 received a condition for management of dab bycatch in the Kattegat trawl + grid UoC, but not for the trawl + SELTRA UoC, as dab comprises 22% and 20% of catch respectively. The team may wish to clarify this and if necessary, make a harmonized decision. Harmonisation should also consider the Danish trawl fishery.

FCI Response: The consideration of dab bycatch in UoC2 has been harmonized with UoC4 and UoC8 (seltra trawling gears in the Kattegat Sea). PI 2.2.2.Condition in UoC2 is lifted.

Skate and spurdog are subject to a landings ban under fishery regulation, not nature conservation legislation – therefore these are vulnerable bycatch rather than ETP species.

FCI Response: Spurdog is now considered as vulnerable bycatch but common skate remains under the ETP section as is subject to CR 43/2014 (see art.12) together with other species. As detailed in http://europa.eu/eu-law/decision-making/legal-acts/index_en.htm, Regulations are binding legislative acts that must be applied in its entirety across the EU.

Tables 17 to 22 are unclear as to how the large % discards are derived; inclusion of Nephrops in the species list may help this.

FCI Response: Discards proportions of all species can be checked in Tables 5 to 8.

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	Subject to the 'General Comments' above, the scoring rationale is clear and reasonable.	No further comments
1.1.2	Yes	Partly	Yes (but with comment on 'Consultation on Condition').	For Sla, an argument is made that ongoing data collection (TV survey) will lead to the development of an appropriate limit reference point. This can support meeting SG60, but appears too low to meet the SG80 requirement for RP's which "can be estimated"(1). The condition appears entirely appropriate to provide a LRP within the current ICES framework. However 'Consultation on Condition' should show that Swedish Government/ICES are prepared to pursue this.(2)	(1) Although there is no formally defined limit reference point, it is implicit that management action would be enacted if stock indicators declined significantly. Even with a short time series of stock biomass estimates from the TV surveys, a limit reference point can be estimated and that estimate can be refined as a longer time series of data becomes available. There is a much longer time series of fisheries-dependent indicators such as LPUE from which a limit reference point could be estimated if required. The score for PI 1.1.2 is therefore unchanged. See general comments above concerning 'Consultation on Condition' and Client Action Plan.
1.1.3	NA				
1.2.1	Yes	Yes	NA	The issue of a lack of a LRP is considered above. Nevertheless, the strategy is clearly designed to keep the stock	No further comments

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
				around the target RP.	
1.2.2	Yes	Yes	Yes (but with comment on 'Consultation on Condition').	For SIa, the harvest controls are desined to keep the stock around the TRP. Within the CFP structure, 'generally understood' LRPs are in place, and could be implemented if required. The condition is appropriate in conjunction with Condition 1; comments above on 'Consultation on Condition' also apply here.(1)	See general comments above concerning 'Consultation on Condition' and Client Action Plan.
1.2.3	Yes	Yes	NA	Information available on this fishery supports the score allocated.	No further comments
1.2.4	Yes	Yes	NA	The rationale provided supports the score awarded.	No further comments
Skagerrak Trawl + Grid					
2.1.1	Yes	Yes	NA	Cod is only main species; selective gear and cod recovery plan are addressing rebuildng of this species stock	No further comments

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
2.1.2	Yes	Partly	NA	Sla at SG100 refers to all retained species; this is not met for this fishery. SG80 is.	Cod is the only one retained species in the grid fishery. All other species apart from nephrops and cod are discarded and considered under the bycatch section. Therefore, the score remains at 95.
2.1.3	Yes	Partly	NA	Sla and c is not met at SG100 as this referes to all retained species, not only main spp.	Cod is the only one retained species in the grid fishery. All other species apart from nephrops and cod are discarded and considered under the bycatch section. Therefore, the score remains at 95.
2.2.1	Yes	Yes	NA	As there are no main bycatch species, a score of 80 is appropriate. See comments for 2.3, however.	Coments noted. Common skate remains in the ETP section as it is subject to European legislation (see CR 43/2014, art.12)
2.2.2	Yes	Partly	NA	Sic is not met at SG100 as this requires a strategy, not a partial strategy.	The team considers that there is a strategy in place for minimising bycatch (regardless is not as efficient as desirable). Sla scores 100 and Sic remains at 100. Total scoring of the PI increases up to 90.
2.2.3	Yes	Yes	NA	The scoring is fully supported by the evidence presented.	No further comments.
2.3.1	No	Yes	NA	The team should review the status of skates, rays and spurdog; as these are not included in ETP legislation, they may need to be considered under bycatch	Acording to MSC CR (v.1.3), CB 3.11.1, ETP species are those listed in the CITES listing and those recognised by national ETP legislation. As all UoC are under European legislation (see CR43/2014, art.12) common skate

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
				species. Removal of spurdog and skate would mean no significant interactions with ETP species.	remains under the ETP consideration. Council Regulations are binding legislative acts that must be applied in its entirety across the EU. Species listed in different tables in the ETP background section and scoring tables are those of special concern recorded by the client, regardless if they are or not considered under the ETP section, and show the efforts made by the client in recording these species. Scoring remains at 80.
2.3.2	Yes	Yes	NA	Measures are appropriate for ETP species.	No further comments.
2.3.3	Yes	Yes	NA	Information provision on interactions, and population status, of ETP spp appears entirely adequate for both areas, although it should be made clear that this relates to species other than spurdog and skate.	Comments noted. Common skate remains in the ETP section as is subject to CR 43/2014.
Kattegat Trawl + Grid					
2.1.1	Yes	Yes	NA	Cod is only main species; selective gear and cod recovery plan are addressing rebuildng of this species stock	No further comments.

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
2.1.2	Yes	Partly	NA	Sla at SG100 refers to all retained species; this is not met for this fishery. SG80 is.	Cod is the only one retained species in the grid fishery. All other species apart from nephrops and cod are discarded and considered under the bycatch section. Therefore, the score remains at 95.
2.1.3	Yes	Partly	NA	Sla and c is not met at SG100 as this referes to all retained species, not only main spp.	Cod is the only one retained species in the grid fishery. All other species apart from nephrops and cod are discarded and considered under the bycatch section. Therefore, the score remains at 95.
2.2.1	No	Yes	NA	The assessment appears appropriate, but it is not clear that spurdog and common skate are ETP – in which case they should be considered as a bycatch species and the assessment reappraised (listing on IUCN red list, for example, does not qualify a species as ETP).	Common skate remains in the ETP section as is subject to CR 43/2014.
2.2.2	No	Probably	No	As above. The confusion between bycatch and ETP species and measures/partial strategy applied to the various species should be reviewed in light of the SGs here. The condition for DAB does not relate to	Common skate remains in the ETP section as is subject to CR 43/2014. The team considers that there is a strategy in place for minimising bycatch (regardless is not as efficient as desirable). The consideration of dab bycatch has been harmonised

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
				the metric of the PISG – a lower discard ratio is not in iteself sufficient. There also seems a different outcome for this PI to SELTRA gear, despite apparently similar bycatch levels?	with UoC4 and UoC8 (seltra trawling gears in the Kattegat Sea). Condition for dab is lifted and PI 2.2.2 score is now 90.
2.2.3	Yes	Yes	NA	Information is sufficient to support the score, including for species mentioned above.	No further comments.
2.3.1	No	Yes	NA	Removal of skate, spurdog should be replaced by a consideration of the effects of bycatch of porpoise. This may lead to a higher score.	Acording to MSC CR (v.1.3), CB 3.11.1, ETP species are those listed in the CITES listing and those recognised by national ETP legislation. As all UoC are under European legislation (see CR43/2014, art.12) common skate remains under the ETP consideration. Council Regulations are binding legislative acts that must be applied in its entirety across the EU. Species listed in different tables in the ETP background section and scoring tables are those of special concern recorded by the client, regardless if they are or not considered under the ETP section, and show the efforts made by the client in recording these species. Possible interactions of harbour porpoise and the grid gear are considered extremely rare by the Swedish client, as the escape window would facilite its releasement.

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
					Scoring remains at 80.
2.3.2	Yes	Yes	NA	Measures are appropriate for ETP species.	No further comments.
2.3.3	Yes	Yes	NA	Information provision on interactions, and population status, of ETP spp appears entirely adequate, although it should be made clear that this relates to species other than spurdog and skate.	Comments noted. Common skate remains under the ETP section as is subject to CR43/2014.
Skagerrak Trawl + SELTRA					
2.1.1	Yes	Partly	NA	The uncertainties surrounding the status of eastern component plaice and witch suggest that further detail on the biological sttaus of these should be provided, or these should be considered under Slc (and potentially d for witch).	Eastern plaice and witch are now been considered under Sic instead of Sla.
2.1.2	Yes	Partly	NA	As above, it should be explained further how the partial strategy will prevent hindering of any recovery of witch or the 'eastern' plaice populations, especially as gear modifications are considered	Information added in the rationale.

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
				ineffective in reducing catches of these.	
2.1.3	Yes	Yes	NA	Skagerrak. Information provision is at least at SG80 level.	No further comments.
2.2.1	No	Yes	NA	The assessment appears appropriate, but it is not clear that spurdog and common skate are ETP – in which case they should be considered as a bycatch species and the assessment reappraised (listing on IUCN red list, for example, does not qualify a species as ETP).	Common skate remains under the ETP section as is subject to CR 43/2014.
2.2.2	No	Probably	NA	As above. The confusion between bycatch and ETP species and measures/partial strategy applied to the various species should be reviewed in light of the SGs here.	The use of the seltra gear and other management measures are seen as a partial strategy by the team, as the design of the seltra gear is not intended to avoid the catch of other species, but to facilitate the escape of roundfish such as cod. The use of the seltra gear targeting nephrops is considered as a mixed fishery. Common skate remains to be considered an ETP species as is subject to CR 43/2014. PI score goes down to 80.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.2.3	No	Probably	NA	As above, both areas.	Comments noted. Common skate remains under the ETP section as is subject to CR 43/2014.
2.3.1	No	Yes	NA	Removal of spurdog and skate would mean no significant interactions with ETP species.	Acording to MSC CR (v.1.3), CB 3.11.1, ETP species are those listed in the CITES listing and those recognised by national ETP legislation. As all UoC are under European legislation (CR 43/2014, art.12), so common skate remains under the ETP section. Species listed in different tables in the ETP background section and scoring tables are those of special concern recorded by the client, regardless if they are or not considered under the ETP section, and show the efforts made by the client in recording these species. Scoring remains at 80.
2.3.2	Yes	Yes	NA	Measures are appropriate for ETP species in both areas.	No further comments.
2.3.3	Yes	Yes	NA	Information provision on interactions, and population status, of ETP spp appears entirely adequate for both areas, although it should be made clear that this relates to species other than spurdog and skate.	Comments noted. Common skate remains in the ETP section as is subject to CR 43/2014.

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
Kattegat Trawl + SELTRA					
2.1.1	Yes	Yes	NA	The status of dab seems more likely to be within biological limits given a long history of abundance increases.	No further comments.
2.1.2	Yes	Yes	NA	Athough there is far less information and management for dab, commensurate recovery of plaice suggests that measures will be effective for this species also. Note general comments on apparently different treatment of Grid and SELTRA gear in Kattegat however – these appear to require reconciliation, also with Danish fishery..	Comments noted. Treatement of dab in Uo2 has been harmonised with UoC4 and UoC8.
2.1.3	Yes	Yes	NA	Information provision is sufficient, although the text should be clearer as to which species are being referred to.	Comments noted. Specification to species referred has been added.
2.2.1	No	Yes	NA	The assessment appears appropriate, but it is not clear that spurdog and common skate are ETP – in which case they should be considered as a bycatch species and the assessment reappraised (listing on IUCN red list, for example,	Comments noted. Spurdog is now considered as bycatch but common skate remains in the ETP section as is subject to CR 43/2014.

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
				does not qualify a species as ETP).	
2.2.2	No	Unknown	NA	The confusion between bycatch and ETP species and measures/partial strategy applied to the various species should be reviewed in light of the SGs here.	The use of the seltra gear and other management measures are seen as a partial strategy by the team, as the design of the seltra gear is not intended to avoid the catch of other species, but to facilitate the escape of roundfish such as cod. The use of the seltra gear targeting nephrops is considered as a mixed fishery. Spurdog is now considered as bycatch but common skate remains to be considered as ETP species. PI score goes down to 80.
2.2.3	No	Probably	NA	As above, both areas.	Comments noted. Spurdog is now considered as bycatch but common skate remains to be considered as ETP species.
2.3.1	No	Unknown	NA	Removal of spurdog, skate should be replaced by a consideration of the effects of bycatch of porpoise	Acording to MSC CR (v.1.3), CB 3.11.1, ETP species are those listed in the CITES listing and those recognised by national ETP legislation. As all UoC are under European legislation (CR 43/2014, art.12), common skate remains under the ETP consideration. Species listed in different tables in the ETP background section and scoring tables are those of special concern recorded by the client, regardless if they are or not considered under the ETP section, and show the efforts

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
					made by the client in recording these species. Effects of bycatch of porpoise has been added.
2.3.2	Yes	Yes	NA	Measures are appropriate for ETP species in both areas.	No further comments.
2.3.3	Yes	Yes	NA	Information provision on interactions, and population status, of ETP spp appears entirely adequate for both areas, although it should be made clear that this relates to species other than spurdog and skate.	Comments noted. Spurdog is now considerd under the bycatch section but common skate remains to be considered as an ETP specie.
Skagerrak Creel					
2.1.1	Yes	No	NA	It seems crab status is more 'highly likely' than 'high degree of certainty' to be within safe biological limits based on the evidence presented, although this would not affect score.	Information has been added regarding crab abundance in the area. Scoring remains unaffected.
2.1.2	Yes	Yes	NA	Scoring is supported by the evidence presented.	No further comments.

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
2.1.3	Yes	Yes	NA	Information provision is sufficient, to support the score awarded.	No further comments.
2.2.1	Yes	Yes	NA	Thescoring is appropriate, although technically, the use of creels if a 'partial strategy'.	Comments noted. As PI 2.2.1 focuses on the bycatch outcome, scoring remains at 80.
2.2.2	Yes	No	NA	As the use of creels is a 'partial strategy', the scoring appears too high for this PI.	Comments noted. The use of the creel along with management measures are seen as a strategy by the team, as they are intended to avoid the catch of anything else apart from nephrops.
2.2.3	Yes	Yes	NA	Information provision is sufficient, to support the score awarded	No further comments.
2.3.1	No	Unknown	NA	The assessment presented is probably correct, but information is scant, and interactions of pot fisheries with ETP species have been identified elsewhere (WA rock lobster, Maine lobster). The team may wish to confirm the high score awarded.	Comments noted. Information has been added and scoring goes down to 95.
2.3.2	No	No	NA	The use of creels, combined with other ETP legislation and management (which is discussed elsewhere, but not here)	Comments noted. Information has been added and scoring goes down to

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
				may comprise a partial strategy, but evidence is not presented that this is a comprehensive strategy.	90.
2.3.3	No	Yes	NA	Scoring appears to depend on assertions by the team. While these are probably correct, some evideence should be presented in support of such a high score.	Comments noted. Information has been added and scoring goes down to 85.
Kattegat Creel					
2.1.1	Yes	No	NA	It seems crab status is more 'highly likely' than 'high degree of certainty' to be within safe biological limits based on the evidence presented.	Information has been added regarding crab abundance in the area. Scoring remains unaffected.
2.1.2	Yes	No	NA	Use of creels appears more a partial strategy than a strategy.	No further comments.
2.1.3	Yes	Yes	NA	Information provision is sufficient, to support the score awarded.	No further comments.
2.2.1	Yes	Yes	NA	The scoring is appropriate, although technically, the use of creels is a 'partial	Comments noted. As PI 2.2.1 focuses on the bycatch outcome, scoring remains at 80.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
				strategy'.	
2.2.2	Yes	No	NA	As the use of creels is a 'partial strategy', the scoring appears too high for this PI.	Comments noted. The use of the creel along with management measures are seen as a strategy by the team, as they are intended to avoid the catch of anything else apart from nephrops.
2.2.3	Yes	Yes	NA	Information provision is sufficient, to support the score awarded	No further comments.
2.3.1	No	Unknown	NA	The assessment presented is probably correct, but information is scant, and interactions of pot fisheries with ETP species have been identified elsewhere (WA rock lobster, Maine lobster). The team may wish to confirm the high score awarded.	Comments noted. Information has been added and scoring goes down to 95.
2.3.2	No	No	NA	The use of creels, combined with other ETP legislation and management (which is discussed elsewhere, but not here) may comprise a partial strategy, but evidence is not presented that this is a comprehensive strategy.	Comments noted. Information has been added and scoring goes down to 90.

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
2.3.3	No	Yes	NA	Scoring appears to depend on assertions by the team. While these are probably correct, some evidence should be presented in support of such a high score.	Comments noted. Information has been added and scoring goes down to 85.
All gears considered below					
2.4.1	Yes	No	NA	Trawl, both areas. This appears to reach the correct conclusion, but lacks analysis of the seriousness of effects. The references cited provide sufficient information to support such conclusions. Creel, both areas. Sla does not present evidence of level of effect.	Comments noted. Information added in the rationale. More information on creel effects on the habitats has been added.
2.4.2	No	Partly	Yes	All gear, Skagerrak. Sla. The features of the strategy should include the ability to modify fishing practices in light of monitoring results – it should be made clear that this strategy is actually 'in place'. On the other hand, management and fishing practices are considered in 2.4.1 to meet the SG80 requirement. In the current absence of management plans for European Sites etc, this may	Comments noted. Information added in 2.4.2.c. PI 2.4.2 scoring remains at 75.

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
	Yes	Partly	Yes	rather represent a wider partial strategy including both fishing practices and protected areas. All gear, Kattegat. The assessment appears appropriate, although the logic of whether the strategy will actually protect sensitive habitat, raher than cod, should be fully explained. The condition appears appropriate, qalthough engagement of relevant agencies should be demonstrated prior to certification..	The strategy for the Kattegat is the same than in the Skagerrak. Moreover, includes areas of special attention for cod recovery.
2.4.3	Yes Yes	Yes Yes	NA NA	Skagerrak, all gear. The amount of information on habitats, and fishing impacts in the Skagerrak and North Sea may support a higher score, particularly for SIa Kattegat, all gear. Significant amounts of information are available, reflected in the score.	Comments noted. Scoring remains at 85. No further comments.
2.5.1	Yes	Yes	NA	Both areas, all gear	No further commetns.
2.5.2	Yes	Yes	NA	Both areas, all gear	No further comments.

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	Both areas, all gear	No further comments.
3.1.1	Yes	Yes	NA	Scoring is fully supported by the evidence presented.	No further comments.
3.1.2	No	Yes	NA	Swedish management consultation systems (rather than only EU) may be relevant to the scoring here? The 80+ score is fully merited on the evidence presented, however.	Swedish management authorities are required to implement EU regulation under the CFP. Further text is provided under this PI: National strategies and action plans are developed by SWAM, the Swedish management authority involving a range of stakeholders in extensive consultation. These can add further management to requirements under EU legislation. The management system (CFP) is developed by the Commission (and adopted by Sweden in its own legislation),
3.1.3	Yes	Yes	NA	Scoring is fully supported by evidence presented.	No further comments.
3.1.4	Yes	Yes	NA	Scoring is fully supported by evidence presented.	No further comments.
3.2.1	Yes	Yes	NA	Scoring is fully supported by evidence	No further comments.

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
				presented.	
3.2.2	No	Yes	NA	The score of 80 is easily supported; aspects of EU and Swedish consultation and communication with stakeholders may merit a higher score, but this is not significant.	The shortcomings in decision-making at an EU level mean that SG100 is not met. Some stakeholders (Environmental NGOs) felt that they were not encouraged to be fully engaged in consultation exercises, again leading to SG100 not being met.
3.2.3	Yes	Yes	NA	Scoring is fully supported by evidence presented.	No further comments.
3.2.4	Yes	Yes	NA	Scoring is fully supported by evidence presented.	No further comments.
3.2.5	Yes	Yes	NA	The reviews of the CFP may be considered regular and external, but this is not significant.	Agree, however this is specific to the fishery management in question, i.e. the Nephrops fishery in this area.

Peer Reviewer 2

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes/No** **Yes**	**Certification Body Response**
Justification: There is substantial evidence presented in support of the findings and gaps are identified. The conclusions are reasonable when weighed against the evidence.		Thank you for your review. The specific points are addressed in relation to the relevant PIs.

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**Yes/No** **Yes**	**Certification Body Response**
Justification: The conditions raised should allow for achievement of SG80. However, in some cases this is outside the control of the client.		No further comments.

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**Yes/No** **Yes**	**Certification Body Response**
Justification: The client action plan in some cases relies on contact with outside bodies and in convincing those bodies to undertake certain work such as further development of reference points. Achievement of this will only be possible if the national or ICES scientists prioritize this work. It would be more convincing if the client commissioned the work. Perhaps this is not necessary but additional clarity on this could be provided.		The client is required to confirm development of the Client Action Plan has involved consultation .and agreement with the relevant parties

General Comments on the Assessment Report (optional)

Background is well presented. The justification text is logical and evidence based.

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	All of the evidence indicates that the stock is very unlikely to be recruitment impaired. MSY is unknown but MSY proxies have been and continue to be developed. Although there is only 2 years experience with the harvest ratio reference point it appears that the stock is fluctuating around this point.	No further comments.
1.1.2	Yes	Yes	Yes	There is no limit reference point. As described it is implicit that the TAC would reduce if the surveys showed a reduction in biomass in order to maintain a given harvest ratio. The justification text in 1.1.2a says that although there is no limit reference point that management will respond to a change in LPUE or TV survey estimates. This will only retain the harvest ratio presumably and is therefore more relevant to the target reference point than to any limit reference. The condition raised which requires development of a limit reference point is appropriate. However, given that the stock currently seems to be stable or increasing (LPUE indicator) and the time to fulfill the condition is just 4 years it may be difficult to developed the suggested B_{msy} trigger.	No further comments.
1.1.3	Yes	Yes	NA	The stock is shown not be be depleted. Stock re-building requirement is therefore NA	No further comments.
1.2.1	Yes	No	NA	The harvest strategy is responsive to the state of the stock. However, as limit reference points have not been identified it is not yet fully designed to achieve all objectives (particularly in relation to a limit point). (1)	(1)The harvest strategy is designed to ensure that the stock fluctuates around its target reference point which

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
				The harvest strategy is likely to work; at least the available evidence indicates that the stock has been maintained in a good position for a number of years. There is a strong monitoring programme in place. It should be possible to establish a process of review of the harvest strategy and its elements. A more robust strategy would be more likely to develop if this was the case.	is well above the level at which recruitment would be impaired, i.e. any implicit limit reference point. It can be concluded therefore that the harvest strategy is designed to achieve stock management objectives reflected in the target and limit reference points. The score for this PI is therefore unchanged. A condition was raised against PI 1.1.2 due to the lack of an explicitly-defined limit reference point.
1.2.2	Yes	Yes	Yes	There is no strategy to reduce exploitation if the stock declines towards a limit reference point (which is as yet undefined). Discussion of this point in the report suggests that standardised LPUE is being used or could be used as an indicator of stock status and that management would respond to this indiator ("if it fell towards an implicit reference point"). Although trends in LPUE are described in the report there is no evidence presented which suggests that management will respond to this indicator. The TAC is defined by the harvest ratio of TV survey: landings. Yes there is no evidnece to suggest that a lower harvest ratio would be used if the burrow density declined to $0.3m^{-2}$. Yes there are a lot of uncertainties in the assessment that are not taken	(1)The assessment team noted that severe oxygen depletion, which forces Nephrops out of their burrows and increases both fishing and natural mortality, appeared to have a strong impact on Nephrops in the Kattegat in 1988. However there is no evidence that oxygen deficiency is likely to impact

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
				into account. The harvest control tool is mainly TAC. The harvest ratio approach to setting TAC has only been adopted for 2 years. Although the stock is relatively stable is it predicted that this may change in the future due to environmental conditions eg oxygen depletion. Is there a risk that the status may move from fluctuaring without trend to unstable with indiidual years of very high mortality due to oxygen depletion. (1) Althought the condition raised describes a reasonable approach achievement of a satisfactory outcome is not within the control of the client. How is the progress towards compliance with the condition going to be monitored. How will DFPO advocate for this? (2)	long term stock trends. (2) See general comments above concerning 'Consultation on Condition' and Client Action Plan.
1.2.3	Yes	Yes	NA	There is significant sampling and monitoring the fishery. However, as described, the system could be described as data rich and assessment poor; the assessment approach is as yet unproven.	No further comments.
1.2.4	Yes	Yes		The stock assessment process has evolved. This process is continuing.	No further comments.
2.1.1	Yes	Yes	NA	Status of main retained species is known. Most are within safe biological limits. In some cases reference points are not defined for main retained species and minor species. The main retained species are within safe biological limits other than cod. The Swedish grid in the Nephrops trawl reduces by-catch of cod. The Seltra trawl (UoC3) is a mixed fishery with 24 minor retained	No further comments.

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
				species.	
2.1.2	Yes	Yes	NA	Main retained species (other than plaice and witch) are subject to management plans. There is a cod recovery plan and the Swedish grid allows for significant reduction in cod bycatch.	No further comments.
2.1.3	Yes	Yes	NA	Quantitative information on retained species is adequate. This information is used to support harvest strategy and management for retained species.	No further comments.
2.2.1	Yes	Yes	NA	UoC1: By-catch is not significant as most species are retained. UoC2: By-catch of Dab occurs. Dab is probably increasing but there are no reference points.UoC2 is unlikely to pose a threat to dab. Creel UoCs: By-catch is unknown. Discard survival of fish may not be high.	No further comments for UoC 1 to 4. For creel UoCs, real data on creel bycatch is unknown, but the team uses research in the area to infer it. Information has been added on the survival of discards in the creel fishery.
2.2.2	Yes	Yes	Yes	By-catch of flat fish is significant in UoC2. A condition is raised to reduce by-catch of flatfish. In creel UoCs by catch is unknown.	Condition on dab is lifted after harmonisation in dab consideration for UoC 4 and 8. Real data on creel bycatch

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
					is unknown, but the team uses research in the area to infer it. Information has been added on the survival of discards in the creel fishery.
2.2.3	Yes	Yes	NA	By-catch is not significnat as most species are retained.	No furhter comments.
2.3.1	Yes	No	NA	Table 17. Alosa spp. are also listed in Annex II of the Habitats Directive. There is no mention of Alosa spp. by catch in the Swedish trawl by-catch Is this because there is no by-catch or no recording of by-catch of these species? By-catch of Alosa in Seltra trawl should be discussed relative to the small population size of these species.	Alosa spp is not considered under the ETP sectionbecause they are subject to a directive, not a regulation. Shad catch has however been recorded by the Danish client in the area, but interactions are expected to be low as shad is a pelagic fish and the different gears of this assessment work in a benthic environment. Scoring remains at 80.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.3.2	Yes	Yes	NA	There seems to be some uncertainty re the identification of all ETP species in the trawl fisheries. Is there any monitoring of cetacean entanglement in creel gear?	There is some uncerintainty in the identification of different rays in the area, but they are not considered ETP species under the MSC standard. No monitoring of cetacean entanglement in the creel fishery is recorded in a periodic basis.
2.3.3	Yes	Yes	NA	How is the sampling or observation for some ETP such as Shad or species where identification in mixed catch may be difficult undertaken? More detail of the observer programmes would be useful.	Acording to MSC CR (v.1.3), CB 3.11.1, ETP species are those listed in the CITES listing and those recognised by national ETP legislation. Alosa spp (see comments by Peer Review 2) is not considered under theETP sectionbecause they are subject to a directive, not a regulation. Shad catch has however been recorded by the Danish client in the area, but interactions are expected to be low as shad is a pelagic

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
					round fish and the different gears of this assessment work in a benthic environment where the catch is benthic or demersal. Scoring remains at 80.
2.4.1	Yes	Yes	NA	Although the fishery may not cause irreversible harm (the habitat will recover over a period of time when the activity stops) it is nevertheless the case that the habitat remains 'harmed' while the fishery is present.	No furhter comments.
2.4.2	Yes	Yes	Yes	There are strategies evolving or developing which will provide increased protection of habitats in the area. Management measures and evidence of their success is not yet available. The condition raised outlines a proposed schedule for demonstrating that such measures are implemented.	No furhter comments.
2.4.3	Yes	Yes	NA	Information on fishing pressures is available. The pressures can be mapped. Risks that these pressures pose to different habitats are well known. The distribution of habitats is thought to be well known although new coral habitats have recently been identified.	No furhter comments.
2.5.1	No	No	NA	For trawl UoCs the justification for these scores is limited to the trophic position of Nephrops. Discussion of effects on biodiversity and habitat physical and biological structure and function is limited. To what degree are the effects reversible and over what time scale; this is relevant given	Comments noted. PI reffers to irreversible harm to key elements ecosystems, such as low

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
				that there are intentions to manage activities in Natura 2000 sites.	trophic level species. Discussion on effects on biodiversity and habitat are studied in the background section. More information on the time scale of the impacts could be obtained through the Mackinson and Daskalov Ecosystem model for the North Sea. Scoring remains at 80.
2.5.2	Yes	No	NA	For trawl UoCs there are strategies in place to protect ecosystem structure and function but a programme of measures is not in place. The justification focuses on fishery management plans in the main and on high level international agreements rather than specific measures and evidence. Insufficient justification is given to show that the partial strategy is successful in limiting effects on ecosystem structure and function. The discussion should be broadened out as per requirement CB3.17.3: "The team should note that "key" ecosystem elements are the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the fishery. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity".	Comments noted. There are is a partial strategy with measures associated, although these are not always enough and should be more specifically addressed Slc80 can be based on plausible argument, such as theory or plausible arguments. Scoring remains at 80.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Certification Body Response
2.5.3	Yes	Yes	NA	There is adequate information on the impacts of the fishery on the ecosystem.	No furhter comments.
3.1.1	Yes	Yes	NA		
3.1.2	Yes	Yes	NA	Management roles and responsibilities are clear	No further comments.
3.1.3	Yes	Yes	NA	Long term objectives are clear	No further comments
3.1.4	Yes	Yes	NA	There are no significant perverse subsidies. There are incentives within EFF and other fishery plans to promote sustainable fishing.	No further comments
3.2.1	Yes	Yes	NA	There are specific objectives to achieve P1 and P2. However, measurable objectives for P2 and its different elements are not as strong as for P1. The justification should be expanded for P2.	Added text: Measurable objectives for P2 elements are identified in the required monitoring under the EU Directive delivered through the Natura network of protected species and habitats.
3.2.2	Yes	Yes	NA	There is a fishery specific decision making process	No furhter comments.

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
3.2.3	Yes	Yes	NA	Monitoring and surveillance is strong.	No furhter comments.
3.2.4	Yes	Yes	NA	There is research activity on various ecosystem components affected by the fishery. These could be better described; the justification text just mentions that a number of national and bi-lateral projects .. are ongoing.	No furhter comments.
3.2.5	No	No	NA	The components of the fishery management system are evaluated although the justification provides examples that are not fishery specific eg the 10 year review of the CFP is not that relevant to the sustainable management of this fishery. The ICES WG process provides review of the elements of P1. The evaluation of P2 indicators is not described.	Nephrops-specific management evaluation is mentioned (ICES/STECF). Added text on P2 elements: Environmental management is also subject to evaluation via the delivery of the Natura 2000 network. Catch reporting, including discarding and ETP interactions via observers, also enables the evaluation of P2 elements.

Any Other Comments

Comments	Certification Body Response

The UoCs are selective and mixed demersal trawl fishery and creel fisheries which targets *Nephrops* but in some cases has a significant main retained species component The trawl UoCs have habitat impacts and potentially wider ecosystem effects. The fishery scores over 60 in all PIs as in all cases it seems to be demonstrated that although the fishery could potentially cause significant impacts that these are effectively mitigated by the management process. Nevertheless every effort should be made to minimize remaining effects. Findings of the assessment should be compared with other similar fisheries in the North Sea that have been certified or are undergoing certification to show equivalence.	The selectivity of gear has to date focused on cod avoidance, which has improved selectivity for roundfish, but not flatfish where extensive discarding still occurs. The landing obligation to be introduced under CFP reform should address this is the near future. However, the team has made a recommendation that gear selectivity be improved to further reduce discards.

Appendix 3. Stakeholder submissions

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 default assessment tree 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 assessment[3] regarding the specific assessment.

A presentation was made by WWF. WWF and Oceana provided some of the background material referenced in the report. Both expressed the need to recognise the impacts of trawling on the seabed, the poor stock status of Kattegat cod and the identification of sensitive habitats, particularly those surveyed by Oceana in the Kattegat.

c. Explicit responses from the assessment team to submissions described in **a.** and **b.** above.

None.

Appendix 3.1 Amendments made to the PCDR following stakeholder consultation

Details to be added at FR (Final Report) stage.