Marine Stewardship Council (MSC)
Public Comment Draft Report

Schleswig-Holstein blue shell mussel fishery

On behalf of the Erzeugerorganisation Schleswig-Holsteinischer Muschelfischer e.V.

Prepared by ME Certification Ltd

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Glossary

Acronym	Definition
CA	Consequence Analysis
CAB	Conformity Assessment Body
CFP	Common Fisheries Policy
CRs	(MSC) Certification Requirements
EU	European Union
KüFO	Küstenfischereiverordnung (Coastal Fisheries Decree)
LFischG	Landesfischereigesetz (State Fisheries Law)
LKN	Landesbetrieb für Küstenschutz, Nationalpark und Meeresschutz, Schleswig-Holstein (Schleswig-Holstein Agency for Coastal Defence, National Park and Marine Conservation)
LLUR	Landesamt für Landwirtschaft, Umwelt und ländliche Räume (State Agency for Agriculture, Environment and Rural Areas)
MEC	ME Certification Ltd
MEP	MacAlister Elliott & Partners Ltd
MELUR	Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume (Ministry for Energy Transition, Agriculture, Environment and Rural Areas)
NABU	Naturschutzbund Deutschland e.V. (Nature and Biodiversity Conservation Union Germany)
PSA	Productivity Susceptibility Analysis
RBF	Risk Based Framework
SMA	Saatmuschelgewinnungsanlagen (artificial substrate spat collectors)
UoA	Unit of Assessment
UoC	Unit of Certification
VMS	Vessel Monitoring System
WWF	Worldwide Fund for Nature

1 Executive Summary

This report is the Public Comment Draft Report for the Schleswig-Holstein mussel fishery. The assessment team consisted of Dr Jo Gascoigne, responsible for Principle 1 and Principle 2, Ulf Löwenberg, responsible for Principle 3, and Kat Collinson, who acted as Team Leader.

A site visit was carried out by the complete assessment team from the 12th January to the 15th January 2016. On the 12th January, the team met with the client representative (Simon Leuschel). A meeting was held in Kiel with Martin Ruth of the Schleswig-Holstein State Agency for Agriculture, Environment and Rural Areas (LLUR) on the 13th January. A stakeholder meeting was then held in the morning at the Schutzstation Wattenmeer in Sylt to listen and record stakeholders' concerns regarding the certification of this fishery and to gather independent information. In the afternoon the Risk Based Framework (RBF) meeting was held. A wide range of stakeholders were available for both meetings. The team held a remote scoring meeting via Skype on the 17th February 2016.

The fishery operates by harvesting mussel seed either from natural spatfall (UoA1) or from floating rope seed collectors (SMAs; UoA2) and relaying the mussels on culture plots for ongrowing (UoAs 1 and 2). The gear used for harvest of seed as well as the culture plots is a mussel dredge.

The fishery is subject to regulation by the Landesfischereigesetz, Küstenfischereigesetz (KüFO), öffentlich-rechtlicher Vertrag inkl. Muschelprogramm (public-law contract incl. Mussel Programme) and via Einzellizenzen (individual licences).The 'Landesbetrieb für Küstenschutz, Nationalpark und Meeresschutz, Schleswig-Holstein' (LKN) is the competent authority for nature conservation and the 'Landesamt für Landwirtschaft, Umwelt und ländliche Räume' (LLUR) is the competent authority for fishery.
While the Landesfischereigesetz defines the overall framework for inland and coastal fisheries, for commercial and recreational fisheries, for the conservation of water bodies and fish stocks, for fisheries administration and others, the KüFo deals with the details such as minimum size and weight, closed seasons, mesh size, mussel culture areas, fishing gears etc.

Since 1978, the German Government has been working with the Danish and Dutch Governments to protect and conserve the Wadden Sea as a tri-lateral cooperation agreement. Other overarching European management affecting the fishery are the Habitats Directive, Birds Directive, Water Framework Directive, Marine Strategy Framework and Natura 2000. All of the fishing areas are located within a Natura 2000 site (the Ramsar-Gebiet S-H Wattenmeer und angrenzende Küstengebiete SPA) and a National Park (Schleswig-Holsteinisches Wattenmeer Nationalpark), which requires that management is kept under review.

All 'sides' in the fishery (including fishers, management bodies and conservation NGOs) have recently negotiated and signed a 'Framework Agreement' (Eckpunktevereinbarung) which provides a framework for the management of the fishery starting on 1st January 2017.

In relation to Principle 1, the team concluded that the fishery does not have an impact on the target stock and does not involve translocation (which is not permitted), hence Principle 1 was not scored.

In relation to Principle 2, the fishery has no 'primary species'. 'Secondary species' were evaluated using the RBF, and determined by stakeholders to be primarily green crab and common starfish. ETP species interacting with the fishery were identified as eider duck, common seal and harbour porpoise. In relation to habitats, the key issue was identified to be the potential impact of the fishery on naturally-occurring subtidal mussel beds, and particularly the question as to whether these beds might naturally persist over several years in the absence of fishing (which is evaluated in detail). In relation to Principle 2 in general, the fishery takes place within an area with a strong conservation framework, as outlined above.

The aggregate scores for each Principle have been preliminarily determined to be as follows: Principle 2: 89.3 and Principle 3: 92.5. No PI has scored <80 so there are no conditions. The preliminary determination of the team (subject to stakeholder review) is that the fishery meets the requirements for MSC certification.

2 Authorship and Peer Reviewers

The assessment team for this assessment were:

Kat Collinson - Team Leader

Kat Collinson has a Master's degree from King's College University in Aquatic Resource Management. She has worked on a number of MSC pre- and full assessments including North Menai Strait mussel fishery, Vietnam Ben Tre clam hand gathered fishery and Walkers Seafood Pty Ltd Australian albacore and yellowfin tuna and swordfish longline fishery. Kat also been involved fishery improvements projects (FIPs) and has recently been involved in a project studying the habitat use and niche partitioning in two species of juvenile shark using active and passive tracking and diet stable isotope analysis.

Up until recently Kat has also been the Manager of MSC Chain of Custody (CoC) projects at MEC and has untaken over 150 assessments and therefore will also act as the team's expert on the traceability for the fishery. Kat has successfully completed MSC team leader training in both v1.3 and v2.0. She has also received training in the Risk Based Framework (RBF) via the MSC online training modules.

Dr Jo Gascoigne - Principle 1 and Principle 2

Dr Jo Gascoigne is a former research lecturer in marine biology at Bangor University, Wales and a shellfisheries expert, with over 25 years' experience working in the fisheries sector.

Jo is a specific expert in bivalves and has a PhD from the Virginia Institute of Marine Science in the USA, which was completed on the Allee effects of the queen conch, *Strombus gigas*. Between 2003 and 2007. She completed postdoctoral research looking at the Menai strait mussel. This work considered all areas mussel culture and specifically looked at the carrying capacity of the system for shellfish culture and effects on stock and reproduction relating to fishing effort. Dr Gascoigne's work also involved detailed study of the management and policies used in the fishery and its implications.

Aside from the above experience Jo has also completed a large amount of work looking at bivalve fisheries around the world. This has included policy based analysis of the king scallop and whelk in UK waters. She has also worked on the creation of management plans and policies in countries including Guyana and Oman.

Based on the above experience MEC is confident that Jo meets the 5 year competency requirement for Principle 1 and Principle 2 experience. She is also a fully qualified MSC Team Leader (including with version 2.0) and has been involved as expert and lead auditor in over 15 MSC pre- and full assessments. She has also received training in the Risk Based Framework (RBF) via the MSC online training modules.

She has also been involved in the use of the RBF on numerous occasions, having completed the required training, and this has also furthered her experience in specific stakeholder interview.

Ulf Löwenberg – Principle 3

Ulf Löwenberg has a Master's degree from the University of Hamburg in Fisheries Science. He is a fisheries biologist with more than 30 years' experience in the fisheries sector. This has included more than 15 years' experience in fisheries and advisory projects, including extensive work in Africa and 8 years' project management. Ulf has been involved in a number of MSC pre-assessments, full assessments and surveillance audits based in Europe. These include Swedish Skagerrak and Kattegat herring fishery, North Sea Saithe Trawl fishery and Western Baltic Spring Spawning Herring fishery.

Ulf is now a freelance fisheries consultant and has worked for private and governmental clients on a number of projects in Europe and Africa. A recent project based in Mauritania, which Ulf was responsible for, was titled 'Management advice in the fisheries sector'. This included support to the Fisheries Ministry in relation to development and implementation of fisheries management plans.

The peer reviewers for this assessment were Dr Robert Blythe Skyrme and Dr Rüdiger Voss:

Dr Robert Skyrme

Rob started his career in 1996 in finfish mariculture, before switching to a focus on wild fisheries. Following his PhD, which focussed on fisheries management and the environmental effects of fishing, he moved to Eastern Sea Fisheries Joint Committee, the largest inshore fisheries management organization in England, where he became the Deputy Chief Fishery Officer. He then became a senior advisor to the UK Government on marine fisheries and environmental issues, leading a Natural England team dealing with fisheries policy, science and nationally significant fisheries and environmental casework. Rob now runs Ichthys Marine Ecological Consulting Ltd., a marine fisheries and environmental consultancy, based in the UK. Rob has undertaken all facets of MSC work as a Lead Assessor, expert team member and peer reviewer, across varied fisheries including those for Alaska pollock, Pacific cod, Atlantic cod, New Zealand hake, yellowtail flounder, Pacific salmon, albacore tuna, American lobster, Japanese scallop, sea scallop, Arctic surfclam and European mussel.

Dr. Rüdiger Voss

Rudi has his main scientific interest in analysing the population dynamics of harvested species in their ecosystem context. In particular, investigating the interplay of species ecology, human use and food web interactions, as well as feedbacks requiring an interdisciplinary approach. Accordingly, he started a fruitful inter-disciplinary collaboration already in his PhD thesis at GEOMAR, Kiel, Germany. Since 2002, he has worked as a postdoctoral researcher and later project coordinator at GEOMAR. Rudi has increasingly incorporated management questions, e.g. multi-species assessment, trade-offs, and fisheries advice, in his work. Furthermore,

unlike ecology, economics provided sound methods to operationalise normative societal objectives such as welfare and sustainability. Therefore, Rudi was grateful for the opportunity to join a newly established inter-disciplinary working group on resource economics at Kiel University in 2008. While being able to keep up biological research regarding key population parameters within the cluster, he also includes human aspects, as driven by economic considerations and needs. Rudi contributed significantly to several national and international research projects, with a main focus on the Baltic Sea. He also coordinated the field activities in the GLOBEC Germany project.

3 Description of the Fishery

3.1 Units of Assessment (UoA) and Scope of Certification Sought

3.1.1 UoA and Proposed Unit of Certification (UoC)

The CAB confirms that the fishery under assessment is in conformity with the MSC scope requirements (FCR 7.4):

- The fishery does not target amphibians, birds, reptiles or mammals;
- The fishery does not use poisons or explosives;
- The fishery does not operate under a controversial unilateral exemption to an international agreement;
- The client group does not include an entity that has been successfully prosecuted for a forced labour violation in the last 2 years;
- The fishery management framework includes a mechanism for resolving disputes and the fishery is not overwhelmed by disputes.

Furthermore, no inseparable or practicably inseparable (IPI) stocks are caught in this fishery.

Note that this fishery entered into the MSC certification process in June 2011 but the client withdrew the fishery in May 2013 prior to the Public Consultation Stage - https://www.msc.org/track-a-fishery/fisheries-in-the-program/exiting-the-program/withdrawn/germany-schleswig-holstein_blue_shell_mussel_fishery_and_culture/assessment-downloads

A description of the Units of Assessment is provided in Table 1. There are two UoAs for this assessment, as there are two distinct operational activities, affected by different management measures and with different effects on the surrounding ecosystem. The relaying and harvesting from the culture plots has been included in both UoAs, but all component activities of each UoA are evaluated separately where necessary. In the absence of 'other eligible' fishers, the UoC is the same as the UoA.

Table 1. Unit of Assessment (UoA) 1 & 2

Species		Blue mussel, *Mytilus edulis*
Geographical range		ICES IVb – in the Schleswig-Holstein part of the Wadden Sea
Method of capture	**UoA 1**	Dredging for wild seed, which is then relayed on culture plots and harvested by dredge when grown.
	UoA 2	Spat / seed collectors are deployed as settlement substrata for larval mussels, which are then transferred to culture plots and harvested by dredge when grown.
Client group		Erzeugerorganisation Schleswig-Holsteinischer Muschelzüchter e.V.
Other eligible fishers		None

3.1.2 Final UoC(s)

(PCR ONLY)

The PCR shall describe:

a. The UoC(s) at the time of certification.
b. A rationale for any changes to the proposed UoC(s) in section 3.1(c).
c. Description of final other eligible fishers at the time of certification.

(References: FCR 7.4.8-7.4.10)

3.1.3 Total Allowable Catch (TAC) and Catch Data

The fishery is not managed via a TAC. Catch data are given in Table 2.

Table 2. TAC and Catch Data

TAC	**Year**	2014	**Amount**	N/A
UoA share of TAC	**Year**	2014	**Amount**	N/A
UoC share of total TAC	**Year**	2014	**Amount**	N/A
Total green weight catch by UoC	**Year (most recent)**	2014	**Amount**	3,427 tonnes
	Year (second most recent)	2013	**Amount**	3,126 tonnes

3.1.4 Scope of Assessment in Relation to Enhanced Fisheries

In conjunction with fishery information provided by the client, including operations, gear and harvest information, the team used Table 1: Scope criteria for enhanced fisheries to determine if the fishery under assessment was eligible to be evaluated under the Enhanced Bivalve Fisheries methodology – Annex SB of the MSC Certification Requirements version 2.0. The team confirms here how the criteria are met:

<u>Linkages to and maintenance of a wild stock</u>

- The fishery relies on the capture of target species from the wild environment;
- The species are native to the geographic region the fishery operates within;
- There are reproductive components of the stock from which the fishery's catch originates that maintain themselves without having to be restocked every year. In this case, the spat naturally settle on 'spat collectors', not only maintaining the stock, but enhancing it.

<u>Feeding and husbandry</u>

This fishery is considered a Catch-and-Grow (CAG). In this case, the 'captive phase' is the capture of spat onto seed/spat collectors.

- The feeding of the mussels at this stage is only by natural means, as the mussels filter feed from the water column;
- No disease prevention involving chemicals or compounds with medicinal prophylactic properties are used in this fishery.

Habitat and ecosystem impacts

A modified habitat is used in this fishery to provide a substrate for mussel spat to collect. These structures can be removed and therefore do not cause serious or irreversible harm to the natural ecosystem's structure or function. The habitat/ecosystem impact of the spat collectors is evaluated under Principle 2 (UoA2).

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

This assessment is not based on an ISBF.

3.2 Overview of the fishery

3.2.1 Operations and fishing area

The Schleswig-Holstein mussel industry captures wild spat settled on either natural substrates or on artificial substrates. Once collected, the spat are then relayed onto culture plots for on-growing.

The artificial substrates (UoA2) are known as Saatmuschelgewinnungsanlagen (SMA). These are stable frameworks that float near the water surface, held in place by long plastic pipes or buoys and anchors to the sea floor. The ropes or nets that make up the substrates naturally attract mussel larvae seasonally which then settle and develop into young mussels. With special equipment, these are carefully harvested and used for stocking the culture plots. The SMAs require a location in the Wadden Sea which has sufficient water depth to ensure that the networks do not touch the ground at low tide. Likewise, they must be able to accommodate the direction of flow and have sufficient distance from one another so that the harvesting vessels can pass between them.

Fishing on natural seed beds (UoA1) is only permitted in the subtidal in restricted areas (see below for details). Seed may be fished from 1st July to 30 April, and seed cannot be landed; only relaid on culture plots. Natural subtidal seed beds are known to be variable in time and space; within the open areas (see below), mussel fishermen may fish whatever seed they can find.

Culture plots (UoA1 and UoA2) are designated under a 6-year permit to individual mussel fishing companies, with the area allocated to each company subject to a maximum 2000 ha limit (reducing to 1700 ha) (under the Framework Agreement, the permit duration will increase to 15 years – see below for details). Seed from wild beds or SMAs are relaid on the culture plots to grow into adult mussels. The mussels must remain on the culture plots for a minimum period of 10 months (i.e. seed relaid before 1 December may not be harvested before 1 October of the following year) to ensure that it reaches a minimum size of 45mm. However, mussels are reportedly usually left on the plots ~2.5 years, to reach a market size of around 60mm. Under the terms of the permit, permit-holders have exclusive fishing rights for mussels within the bounds of their culture plots. In the future, it is planned to amalgamate the permit system for culture plots and SMAs, such that companies will hold permits for an area to contain both the culture plots and the SMAs (SMAs up to a maximum of 250 ha), to be arranged at the company's discretion. There is a closed season for the harvesting of adult mussels from the culture plots (15 April-30 June). Mussel fishers undertake some husbandry on the culture plots – e.g. removing and relaying mussels as they grow to ensure optimal densities, and 'cleaning' the plots of starfish before relaying (details given below).

The area of operation for this fishery is the west coast of Schleswig-Holstein in the German Wadden Sea (Figure 2). Figure 3 shows the specific fishing area of the fishery.

Figure 1. Rope culturing area of the Schleswig Holstein mussel fishery

Figure 2. A map of Schleswig-Holstein and its location in Europe

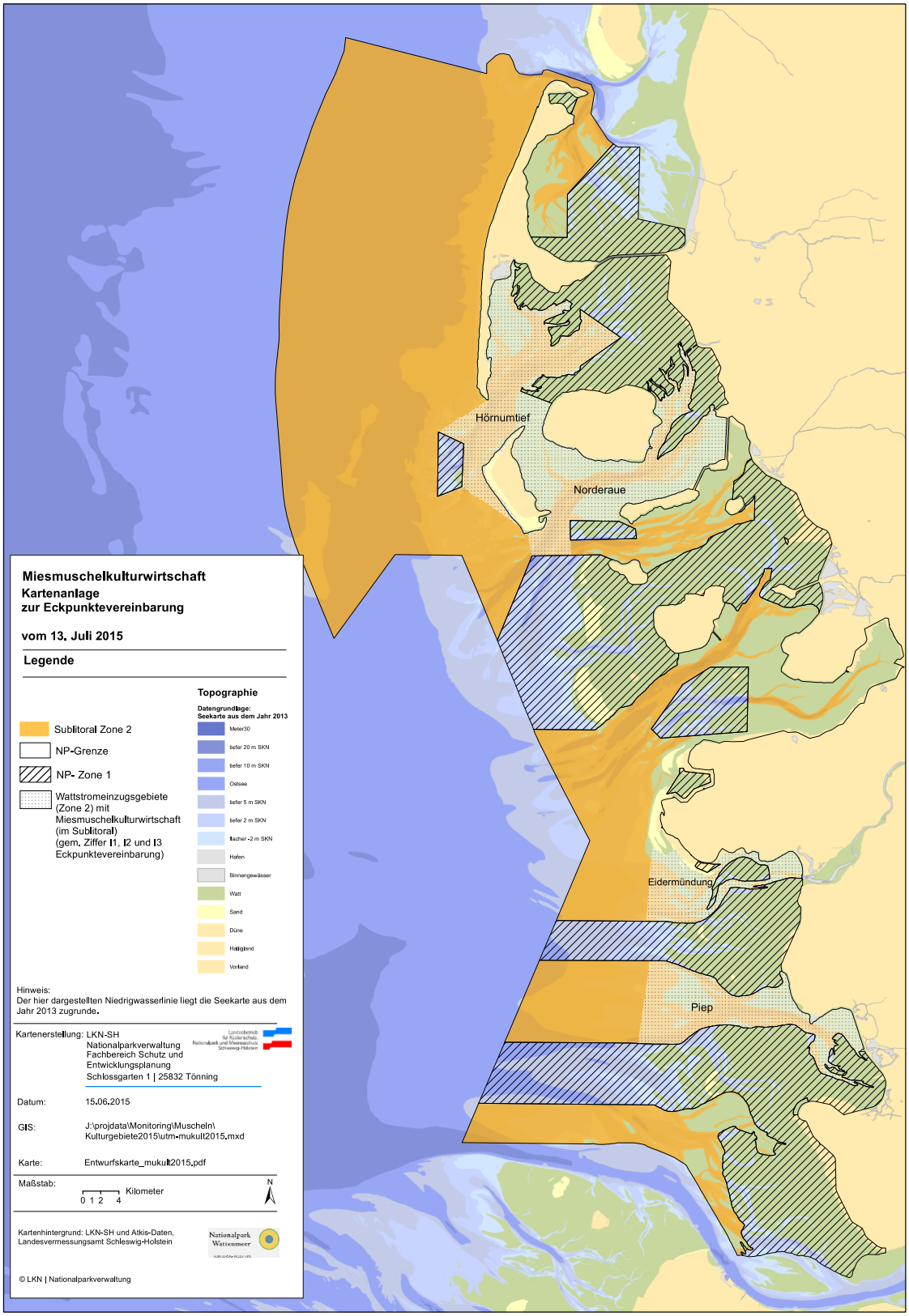

Figure 3. Mussel culturing and harvesting area of the fishery in Schleswig-Holstein. Mussel fishing activity (spat collectors, wild seed harvest and on-growing plots) is permitted outside the hatched areas. Orange = subtidal areas. Map taken from the Framework Agreement.

3.2.2 History of the fishery[1]

Up to the early 20th century, the mussels were almost exclusively collected by hand on the tidal flats as they became dry with the falling tide. With the advent of the First World War, there was an increasing demand for domestically produced nutritious foods. The mussels on the tidal flats were harvested in large quantities, this took place partly at low tide with pitchforks, but increasingly at high water with landing nets or towed equipment, the so-called muscheldredgen or -dredschen. By this time, the existing transport infrastructure meant sales on a regional level were possible and the mussels were sold in northern Germany as part of the war food rations. The mussel production and processing were clearly defined by government guidelines and was operated by specially founded companies

After the war, landings were reduced with the withdrawal of Dutch vessels and some harsh winters but this soon changed as Germany started to recover. Key to the change was a parasitic infestation of the mussel stocks present in the Netherlands and Lower Saxony rendering them un-marketable; the Schleswig-Holstein Wadden Sea fishery made up the local mussel demand. The demand was so great that the state government was forced to introduce regulation of mussel fishery for the first time.

The Schleswig-Holstein mussel industry has continued to develop, supplying the major markets of the Rhineland, Belgium and France. The Schleswig-Holstein mussels have been increasingly marketed through local trading centres and a brisk trade between the neighbouring countries has survived to this day.

3.2.3 Management framework

The fishery is subject to regulation by the Landesfischereigesetz, Küstenfischereigesetz (KüFO), öffentlich-rechtlicher Vertrag inkl. Muschelprogramm (public-law contract incl. Mussel Programme), Einzellizenzen (individual licences).

The 'Landesbetrieb für Küstenschutz, Nationalpark und Meeresschutz, Schleswig-Holstein' (LKN) is the competent authority for nature conservation and the 'Landesamt für Landwirtschaft, Umwelt und ländliche Räume' (LLUR) is the competent authority for fishery.

While the Landesfischereigesetz (Germany 1996) defines the overall framework for inland and coastal, for commercial and recreational fisheries, for the conservation of water bodies and fish stocks, for fisheries administration and others, the KüFo (Germany 2008) deals with the details such as minimum size and weight, closed seasons, mesh size, mussel culture areas, fishing gears etc.

Since 1978, the German Government has been working with the Danish and Dutch Governments to protect and conserve the Wadden Sea as a trilateral cooperation agreement. Other overarching European management affecting the fishery are the Habitats Directive, Birds Directive, Water Framework Directive, Marine Strategy Framework and Natura 2000.

[1] Erzeugerorganisation Schleswig-Holsteinischer (client group) website. Available at: http://www.muschelfischer.info/historie/

All of the fishing areas are located within a Natura 2000 site (the Ramsar-Gebiet S-H Wattenmeer und angrenzende Küstengebiete SPA) and a National Park (Schleswig-Holsteinisches Wattenmeer Nationalpark), which requires that management is kept under review.

All 'sides' in the fishery (including fishers, management bodies and conservation NGOs) have recently negotiated and signed a 'Framework Agreement' (Eckpunktevereinbarung) which provides a framework for the management of the fishery starting on 1st January 2017 (Germany, 2015).

Full details on the management framework of the fishery, including the Framework Agreement, are given in Section 0.

3.2.4 Vessels, ports and fishing gear

There are 8 fishing vessels operating within the group, each vessel having four dredges. These vessels vary in length between 36 and 45 metres.

Figure 4. One of the client vessels

There is one additional vessel, Janne (YE 23), which is a Dutch vessel with specialist equipment used only for the collection of spat from the SMA rope systems.

Table 3. Client group vessel list

Name	PLN	Tonnage	LOA (metres)	Operator
Johanna Leintje	WYK 2	419 t	43.42 m	Andre de Ronde
Trijntje	WYK 3	377 t	43.38 m	Jan Schot
Capella	WYK 5	217 t	35.60 m	Pascal de Leeuw
Adriaan	WYK 7	187 t	36.22 m	Olaf Kleye
Wattenläufer	WYK 8	280 t	39.99 m	Sieb Kuiper J. Tanis
Simon Alexander	WYK 9	406 t	43.59 m	Adriaan Leuschel
Royal Frysk	HOO 70	345 t	45.54 m	David de Leeuw
Siebennus Gerjets	HOO 71	221 t	38.65 m	Julien de Leeuw
Janne	YE 23	221 t	42.30 m	Andreas Iden

There are two ports of landing used by the fishery; Hörnum on Sylt and Dagebüll, on the west coast of the Schleswig-Holstein mainland. Harvested mussels are transported to the Netherlands by road for sale at the auction in Yerseke.

The fishing gear used to harvest the mussels is a mussel dredge. The dredges are restricted to a maximum width of 2m and a maximum weight of 350kg. A typical dredge is illustrated in Figure 5. Vessels may fish with up to 4 dredges at a time.

Figure 5. Example of a mussel dredge used by the fishery

3.3 Principle One: Target Species Background

According to the MSC Certification Requirements and Guidance (version 2.0), for a catch and grow enhanced bivalve fishery such as this, the team should evaluate whether or not the fishery has an impact on the target stock biomass, and whether it includes translocations. If the team concludes that there is no impact on the biomass of the target stock and no translocations, then the team may choose not to score Principle 1 (see clause SB2.1.4 of MSC Certification Requirements (CRs) version 2.0).

3.3.1 Potential impact of planktonic spat collection

The team considered that the mussels taken from the SMAs would not otherwise settle within the ecosystem – i.e. this is 'additional' to the target stock. In relation to impacts on the target stock therefore, the issue is only around fishing of wild seed beds.

3.3.2 Potential impact of seed mussel dredging

The seed mussel dredge fishery operates only in the subtidal – all intertidal biomass is protected from fishing. All the mussels fished from subtidal seed beds are relayed to culture plots where they are cultivated to reduce natural mortality as far as possible (i.e. laying and relaying as close as possible to optimal densities, removing starfish from the plots). The mussels must remain on the plots for a minimum of ~one year or until at least 40mm shell length, but generally remaining on the plots ~2.5 years to reach optimal market size. Mussels start to spawn from their first year and spawn twice a year so during this time they will spawn several times (Thompson, 1979; Sprung, 1983). The mussels relaid on the culture plots from the SMAs will also spawn in the same way – providing a supplement on top of 'natural' reproduction.
A key question remains, however, the extent to which subtidal seed beds would persist in the absence of fishing. Fishery-independent surveys and monitoring of subtidal beds in the Wadden Sea (not only in Schleswig-Holstein) remains limited because they are obviously more difficult to find and evaluate than intertidal beds. There has, however, been some scientific work[2] in the Wadden Sea over the years, which suggests that while the location of subtidal beds is persistent (i.e. they tend to form in the same places), the biomass of mussels on these beds is highly variable (by several orders of magnitude) on both short (weeks) and long (years) timescales, depending on factors such as the amount of spatfall, ice winters, parasitism and predation as well as fishing pressure (Dankers and Koelemaij, 1989; Obert and Michaelis, 1991; Nehls and Thiel, 1993).

There was extensive stakeholder discussion around the question of whether the subtidal seed beds used by this fishery are ephemeral or stable, with stakeholders holding divergent views on the question and a lack of solid data for this area specifically. It appears to be generally accepted that the beds which are fished are ephemeral in terms of mussel biomass – although fishermen remove only a proportion of the total seed (estimated to be ~~80%; Martin Ruth,

[2] This work is well-summarised at http://www.ukmarinesac.org.uk/communities/biogenic-reefs/br4_4.htm

pers. comm.), the remaining 20% of the seed does not persist, being removed by starfish predation either in that year or the following year (two case histories are given for this area in the 2011 'Monitoring and Management Report'; Nehls et al., 2011, Section 7.10.2). It has also been known that seed beds have been found by the fishermen but have disappeared before they were fished, which also suggests that that seed fishing is not the (only) cause of destabilisation. There is no hard evidence of extensive stable subtidal mussel beds in the area (i.e. beds with continual mussel biomass present), although two areas are reportedly known which may be persistent mussel beds. In other areas (e.g. Morecambe Bay, the Exe estuary (MEC, 2016; MEP, 2012; Dare 1976) seed mussel beds are also known with certainty to be naturally ephemeral (i.e. although the beds tend to form in the same areas, the biomass from a given settlement does not persist and at any given time there may or may not be mussels present). Although it is not certain that these observations can be extrapolated to the Wadden Sea, they are consistent with the patterns reported by scientists for the Wadden Sea as summarised briefly above.

Overall, it seemed likely to the team, given observations in the Wadden Sea and in other similar ecosystems, and given the high energy nature of the environment, as well as the periodic high density of starfish, that the subtidal seed beds would be mainly ephemeral with or without fishing – i.e. that although the location of the beds may be persistent, the presence and biomass of mussels in these areas is likely to be highly variable and unpredictable. The team however accepts that hard data are currently limited on this point – the implementation of the Framework Agreement (see Sections 3.2.3 and 3.5.5 for details) will allow resolution of this point by providing areas closed to the fishery which can be monitored.

What causes these beds to be ephemeral (in terms of biomass)? There is clearly not a lack of recruits, as shown by the colonisation of the SMAs – the issue in terms of natural seed availability seems to be rather that the mortality of newly settled and juvenile mussels on subtidal beds is naturally very high. This is also supported by data from elsewhere; e.g. Dare (1976) reported annual mortalities of 74% for 25mm mussels and 98% for 50mm mussels on an exposed, low-lying intertidal mussel bed. Potential sources of natural mortality are erosion or smothering by mobile sediment and predation (notably starfish, also crabs and eider ducks); starfish predation seems to play a key role in this ecosystem, as described further below.

It cannot be ruled out that the fishery plays some role in disrupting the development of these beds – i.e. they are more ephemeral (disappear quicker) than they would be in the absence of fishing (which is logical, given that that fishery is removing biomass). Nevertheless, it is clear that the fishery is not impacting significantly on the overall stock biomass. In fact, given that seed mussels are removed from the natural beds where they are likely to suffer from high natural mortality, and relaid in areas where they are subject to a measure of husbandry to try and minimise mortality (details given below), the fishery is most likely adding to the total mussel biomass in the system, or at the very least compensating in terms of biomass for any loss of natural subtidal beds due to fishing.

3.3.3 Translocations

Translocations are only permitted within Schleswig-Holstein according to the Landesfischereigesetz (LFischG) (Germany 1996). In relation to the Wadden Sea, this means

that mussels may not be brought from other parts of the Wadden Sea (Lower Saxony, the Netherlands, Denmark) even though ecologically it is the same system. It is, however, theoretically possible under the regulations for mussels to be translocated between the Baltic and North Sea coasts of Schleswig-Holstein. In practice, however, this does not happen, because reportedly the mussels do not thrive, the environment (salinity, temperature etc.) being quite different on each side. This practice is also specifically excluded from the Framework Agreement, so would be against the terms of the licence once this enters into force, since this document forms the basis of the licence conditions.

3.3.4 Conclusion

Overall, in relation to Principle 1, the team concluded that i) the fishery has no significant impact on the mussel stock and ii) movements within the Schleswig-Holstein Wadden Sea are all within the same system and therefore do not constitute translocation. Therefore, the team decided that Principle 1 is not required to be scored in the fishery. **Note that should mussels be brought into the system from elsewhere, these mussels could not be sold as MSC until the movement or translocation has been evaluated under MSC procedures**.

The target species for this assessment is not a key Low Trophic Level (LTL) species (as defined by MSC CRv2.0).

3.4 Principle Two: Ecosystem Background

This section of the report outlines the fishery's potential impacts on the wider ecosystem. Five key components are considered to cover the range of potential ecosystem elements that may be impacted by the fishery. These are:

- **Primary species**, non-target species: species where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points.
- **Secondary species**: non-target species: species where management tools and measures are **not** in place, intended to achieve stock management objectives reflected in either limit or target reference points.
- **ETP species**: Endangered Threatened or Protected species (see SA 3.1.5 of MSC CRs for full details).
- **Habitats**: the habitats within which the fishery operates
- **Ecosystem**: broader ecosystem elements such as trophic structure and function, community composition, and biodiversity.

Under each of those five components, particular attention was paid to:

- **Outcome**: the status of the impact or the risk that the fishery poses to that component.
- **Management**: the management strategy for the component.
- **Information**: the monitoring and information available to inform the outcome and management of the component.

3.4.1 Ecosystem and conservation

The Wadden Sea is a World Heritage Site. According to the designation[3], it is the largest unbroken system of intertidal sand and mud flats in the world, and one of the last where natural processes continue to function relatively undisturbed. It is also an important site for shore- and seabirds, particularly as a staging point on migratory pathways - it is estimated that 10 - 12 million pass through the area each year (Laursen et al., 2009). The Wadden Sea is also designated as a National Park in Schleswig-Holstein, Lower Saxony and Hamburg (Nationalpark Wattenmeer) as well as in Denmark, and a conservation area in the Netherlands, with designated Ramsar sites, SACs and SPAs in each country as well. The trilateral Wadden Sea Commission provides a joined-up approach to conservation across the whole ecosystem via a 'Wadden Sea Plan', most recently updated in 2010 (Wadden Sea Secretariat, 2010).

The National Park is zoned, with a 'core area' having limited access – it is closed to seed mussel fishing, culture plots and seed collectors. There are also some additional closed areas as defined in the Framework Agreement (see Figure 3).

[3] http://whc.unesco.org/en/list/1314

3.4.2 Non-target species

The catch of non-target species in the fishery was considered at a workshop held on Sylt in January 2016. This workshop was attended by both fishers and environmental NGOs. The key findings are summarised briefly below.

Primary species

All stakeholders agreed that no primary species were caught in the fishery.

Secondary species

Stakeholders identified green crabs (*Carcinus maenas*) and starfish (*Asterias rubens*) as the main species dredged up with the mussels from both the seed beds and the culture plots (i.e. both UoAs). It is likely that there are many other species present on subtidal mussel beds. Nehls et al. (2011) provide a long list for intertidal mussel beds; the analysis was not done for the subtidal but a comparison of the low intertidal and the subtidal in Saier (2002) suggests that the species list is similar, although the relative abundance of species is somewhat different. The list includes >50 species of polychaete, oligochaetes, crustaceans (barnacles, amphipods, isopods, crabs and shrimp), bryozoans, hydroids, tunicates, other species of bivalve, gastropods, chitons, nemerteans and flatworms – i.e. representatives of many phyla of marine fauna. The epifaunal biomass and diversity of ephemeral subtidal mussel beds may vary as a function of time since initial mussel settlement, but even newly-formed beds are still likely to have higher diversity and biomass of epifaunal species than the surrounding sandflats – the same goes, of course, for the mussel culture plots.

Bycatch taken from the seed beds is relayed on the culture plots along with the mussels, so presumably survives, although there may be some mortality (see e.g. Bergmann and Moore, 2001 in relation to starfish). Starfish are removed from the catch as much as possible and dumped in the sea away from the culture plots, to reduce losses on the culture plots from predation. Starfish are also removed in the same manner from empty beds before mussels are relayed, using a rough material which is towed behind the vessels – these starfish are also dumped in the sea away from the plots.

Only qualitative data are available on the bycatch of crabs and starfish, and no data on the bycatch of minor species – the impact of the fishery was evaluated using the RBF.

3.4.3 ETP species

There is no indication of any direct interactions with ETP species in this fishery, such as capture in dredges or physical impact of fishing gear on ETP species. A brief summary of the ETP species known to occur in the area and which could have some indirect interaction with the fishery is given below.

Birds: The Wadden Sea is an internationally important area for shore- and seabirds, all of which are protected in Schleswig-Holstein under the National Park laws, as well as under the Birds Directive (SPA). Since all intertidal mussel beds are protected from fishing, the fishery

does not interact with the waders that forage for bivalves in the intertidal (e.g. oystercatchers; *Haematopus ostralegus*). It may, however, interact with eider ducks (*Somateria mollissima*), which dive for mussels in the subtidal, feeding extensively on the culture plots. There is no evidence of any direct impact on eider ducks by mortality or injury from the fishery. The Wadden Sea is, however, an important area for eider ducks to moult, and during this period they are reportedly sensitive to disturbance. Although many other species of birds are present in the system at various times, stakeholders did not identify any interactions with other species.

Laursen et al. (2009) report that the numbers of eider using the Wadden Sea declined ~40% between 1992/3 and 2006/7 (although this followed a big increase in numbers in the 1970s and 1980s (Christensen, 2008). In the Schleswig-Holstein Wadden Sea specifically, eider duck numbers appear to have been fairly stable since 2000 (Kempf, 2014 – see Figure 6). Mussels are an important food source for eiders in the Wadden Sea, and according to papers cited by Laursen et al. (2009), subtidal mussels are preferable to intertidal (because they have thinner shells) – hence the protection of all intertidal mussel beds has not helped this species as much as oystercatchers. In the past, there is evidence (although indirect) that overexploitation of mussels beds in the Wadden Sea was a significant factor leading to starvation and mortality of eiders (Camphuysen et al., 2002); one of the reasons, presumably, why the conservation organisations view this fishery with caution. Nowadays, it seems likely however, that the fishery acts to increase the biomass of mussels in the subtidal Wadden Sea (see analysis in Section 0 above), and hence increase the food supply for eiders. Other threats in the Wadden Sea may include disturbance in moulting and roosting areas from tourism activities, and elsewhere may include hunting, conflicts with other fisheries (e.g. gillnets) and climate change (BirdLife International, 2016).

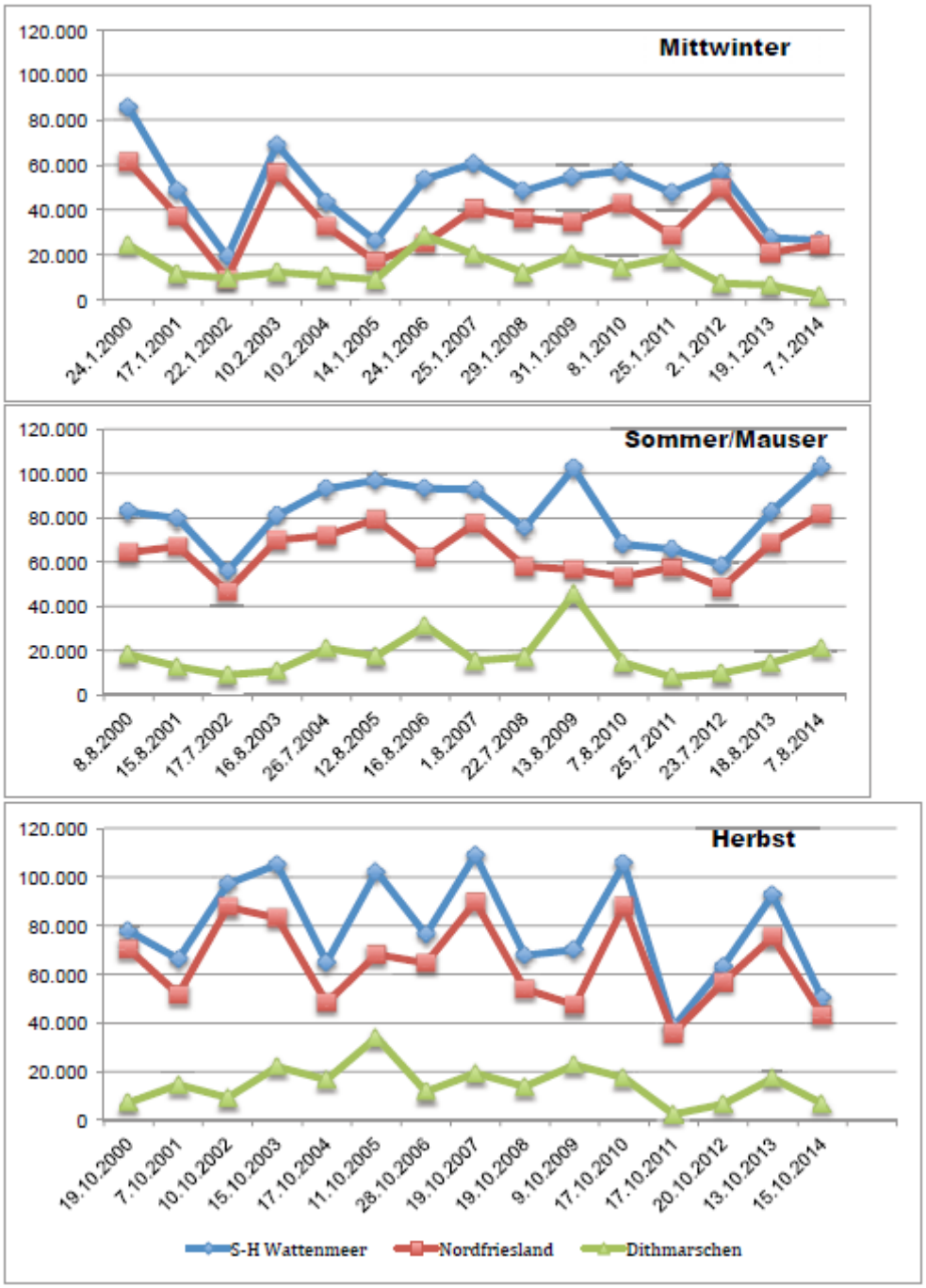

Figure 6. Numbers of eider ducks in the Schleswig-Holstein Wadden Sea (blue line) in winter (top), summer / moulting (middle) and autumn (bottom). From Kempf, 2014.

Mammals: Harbour porpoises (*Phocoena phocoena*), as well as a breeding population of harbour seals, are present in the Wadden Sea, with the latter reportedly increasing overall, although it is periodically knocked back by disease outbreaks (Galatius et al., 2014). It is not thought that these species interact much with the mussel fishery, although disturbance is an issue that is being considered by the on-going appropriate assessment (under the Habitats Directive) of the fishery (see below).

European oysters: European oyster (*Ostrea edulis*) is locally extinct in the Wadden Sea, although Pacific oyster (*Crassostrea gigas*) is abundant on intertidal mussel beds. One stakeholder raised the possibility that the fishery might be impeding the re-establishment of European oysters by preventing permanent subtidal 'reefs' from forming (see discussion under 'habitats' below). The team concluded that there may be a variety of factors which have caused the loss (and prevented the re-establishment) of European oysters in the area, and that it was difficult to evaluate such a hypothetical situation; European oysters were not, therefore, considered as an ETP species in this fishery (since they are not present). The issue of subtidal 'reefs' is, however, considered in detail under habitats.

3.4.4 Habitats

The Wadden Sea is largely an area of intertidal sandflats cut by tidal channels, with the exact configuration of banks and channels varying over time as sediment is transported by tidal currents, winds and storms. Figure 7 shows a satellite image of the Wadden Sea (Schleswig-Holstein part more or less in the white box) at low tide, demonstrating the sedimentary nature of the environment. It also shows the island of Sylt in detail (in the black box) with images at high and low tide, giving an idea of the nature of the tidal channels where the fishery operates as well as demonstrating how energetic the environment is.

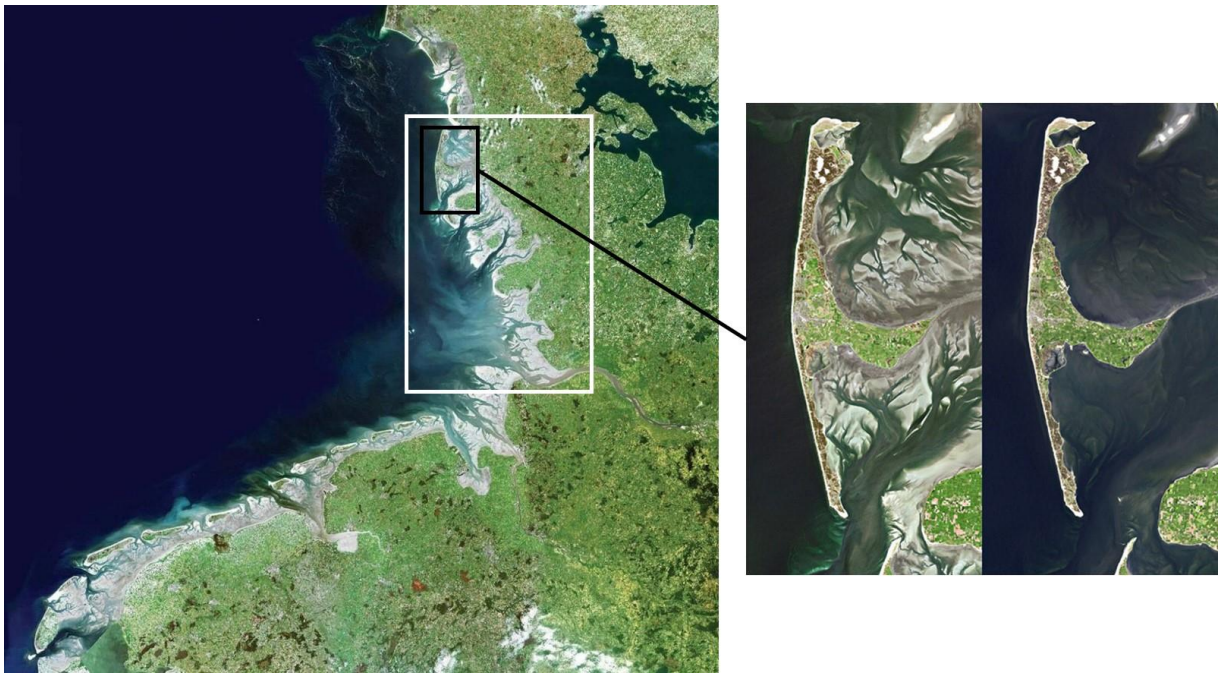

Figure 7. Satellite image of the Wadden Sea (left: S-H in the white box) and the island of Sylt at high and low tide (right: expansion of the black box area in the left-hand image). Wadden Sea image from: http://www.waddensea-secretariat.org/about-us/about-the-wadden-sea; Sylt image from: http://throughthesandglass.typepad.com/through_the_sandglass/2010/06/sylt-no-its-sand-mainly---a-german-island-on-the-move.html

Mapping of the subtidal zone started in 2009, and one of the key aims is to identify Habitats Directive habitat type 1170 ('reef') which under the German definition includes subtidal mussel beds (although in other member states these are classified differently). The mapping is done using acoustic methods (side scan sonar, single-beam echo sounder), with groundtruthing via

grab samples and some towed video. This mapping has identified some reef areas (see Figure 8), although at the site visit, some stakeholders were sceptical that these mussel beds were really persistent over several years (see the discussion of this point in section 3.3.2 of this report).

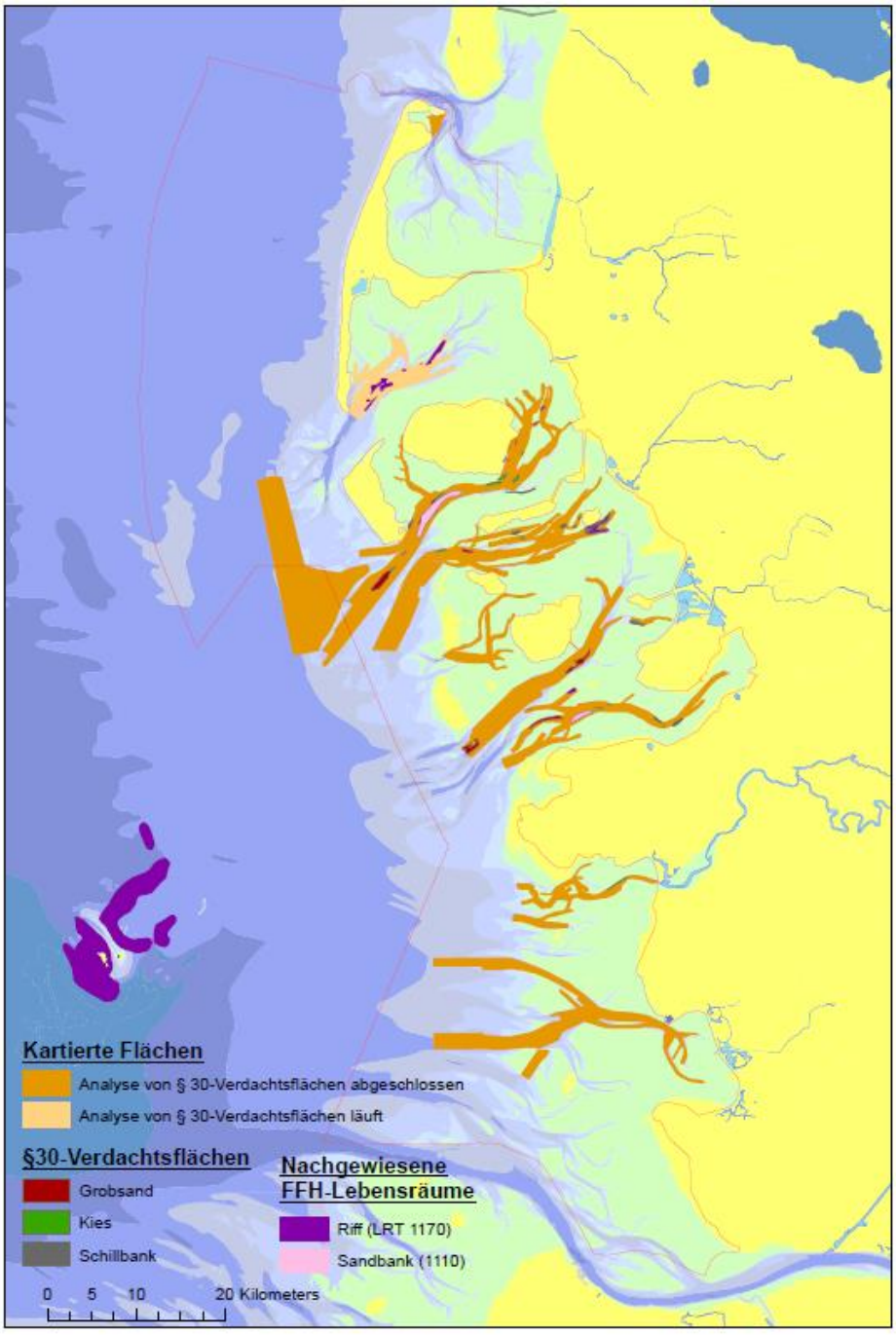

Figure 8. Subtidal habitat maps from the National Park authority, from March 2016. 'Reef' (subtidal mussel beds, excluding the culture plots) are in purple ('riff'). NB: the offshore purple area is a different kind of reef, not mussels. Orange = mapping ongoing; red = coarse sand, green = gravel, grey = shell debris; purple = reef, pink = sandbank. Source: SH Wadden Sea National Park authority.

The Framework Agreement addresses impacts on 'reefs' from the fishery. All identified reefs are excluded from the seed mussel fishery unless a habitat impact assessment can exclude major disturbance. Any new reefs larger than 100 ha are likewise excluded unless major disturbance can be excluded; with compensation for the fishery in the event this happens.

The FCR version 2.0 requires the assessment team to identify and justify i) commonly encountered ('main') habitats, ii) vulnerable habitats ('VMEs') and iii) minor habitats (being all those not included in i and ii). Since the system is largely sedimentary, the team identified intertidal and subtidal sand and mud as 'main' habitats (see satellite image Figure 7). Since intertidal mussel beds are closed to the fishery, the team identified subtidal seed beds and 'biogenic reefs' as VMEs. No 'minor' habitats were identified.

Habitat impacts were considered in reference to three activities: i) fishing for seed mussels on subtidal seed mussel beds; ii) potential habitat impacts of the seed mussel collectors in providing novel hard substrate habitat and via bio-deposition and iii) the changes to habitat caused by the presence of mussel culture plots.

3.4.5 Cumulative impacts

The UoA includes the entire mussel fishery in this area, and does not interact with neighbouring fisheries (Lower Saxony), and therefore there are no cumulative impacts to consider.

3.5 Principle Three: Management System Background

3.5.1 European legislation

As a member State of the European Union Germany's fishery is managed through the Common Fisheries Policy of the EU. The CFP was first introduced in the 1970s and went through successive updates, the most recent of which took effect on 1 January 2014 (1380/2013). The CFP aims to ensure that fishing and aquaculture are environmentally, economically and socially sustainable and that they provide a source of healthy food for EU citizens. Its goal is to foster a dynamic fishing industry and ensure a fair standard of living for fishing communities. This includes commitments to:

- Fish stocks at maximum sustainable yield (MSY)
- Greater regionalization (through increased roles for Regional Advisory Councils, including the North Sea Advisory Council (North Sea AC)
- An ecosystem approach to fisheries by ensuring fishing capacity is in line with fishing opportunities and moving more stocks under Long Term Management Plans
- An obligation to land the fish that is caught (discard ban)

The CFP includes requirements for fishing vessels longer than 12 metres to report their logbook data, including catch data, electronically and to have an approved satellite-based vessel monitoring system (VMS) on board. Fishing vessels longer than 18 metres are also required to have an automatic identification system (AIS) on board. From 1 May 2014, AIS must be on board all vessels over 15 metres in length.

Implementation of the CFP at a national level is left to the individual Member States. National fisheries administrations are responsible for a range of management and regulatory duties, including management of fleet activity, national quota, monitoring and control of all fisheries occurring within national jurisdiction, collection, collation and transmitting of key fishery data, and undertaking at least a base range of scientific monitoring and development work.

Mussels are a non-quota species under the common fisheries policy. Therefore, EU technical regulations and yearly regulations establishing TACs do not apply to the mussel culture and fishery. On the other hand, other EU regulations dealing with nature protection, production areas and water quality do apply. There are a number of EU Directives regulating different environmental aspects:

The **Habitats Directive** (Council Directive 92/43/EEC) aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. It forms the cornerstone of Europe's nature conservation policy with the Birds Directive and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments.

The purpose of the **Water Framework Directive** (Directive 2000/60/EC) is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. It will ensure that all aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands meet 'good status' by 2015.

The aim of the **Shellfish Directive** (Directive 2006/113/EC) is to protect or improve shellfish waters in order to support shellfish life and growth. It is designed to protect the aquatic habitat of bivalve and gastropod molluscs, which include oysters, mussels, cockles, scallops and clams. The Directive requires Member States to designate waters that need protection in order to support shellfish life and growth. The Directive sets physical, chemical and microbiological requirements that designated shellfish waters must either comply with or endeavour to improve

The **Maritime Strategy Framework** (Directive 2008/60/EC) outlines a transparent, legislative framework for an ecosystem-based approach to the management of human activities which supports the sustainable use of marine goods and services. The overarching goal of the Directive is to achieve 'Good Environmental Status' by 2020 across Europe's marine environment.

The **Birds Directive** (Council Directive 2009/147/EC aims to protect all of the 500 wild bird species naturally occurring in the European Union. Urban sprawl and transport networks have fragmented and reduced their habitats, intensive agriculture, forestry, fisheries and the use of pesticides have diminished their food supplies, and hunting needed to be regulated in order not to damage populations.

Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all 28 EU countries, both on land and at sea. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive.

3.5.2 National legislation

A number of Federal and State Laws and Regulations govern the fishery in German territorial waters. The most important are presented in the following:

The **Gesetz zur Regelung der Seefischerei und zur Durchführung des Fischereirechts der Europäischen Union** (Sea Fisheries Law, 1984) is the basis of commercial fishing at sea, particularly in the German EEZ of North Sea and Baltic. In addition, it regulates tasks and responsibilities for the official fisheries monitoring and control.

The **Seefischereiverordnung** (Sea Fisheries Regulation, 1989) contains details and implementing regulations for the Sea Fisheries Law.

The **Bundeswasserstraßengesetz** (Federal Waterway Act, 1968) covers maritime waterways and inland waters and regulates traffic, maintenance, extension and reconstruction, security etc.

The **Gesetz über Naturschutz und Landschaftspflege** (Federal Nature Conservation Law, 2009) provides the legal basis for the subjects of protection nature and landscape and for the actions of nature protection and landscape conservation in Germany the legal basis for the protection.

The **Fischereigesetz für das Land Schleswig-Holstein** (Schleswig-Holstein Fisheries Law, 1996) aims at the protection, conservation and development of the diverse flora and fauna of coastal and inland waters and of a good water quality and particularly of the fish stocks in their natural diversity and their sustainable exploitation.

The **Landesverordnung über die Ausübung der Fischerei in den Küstengewässern** (State Regulation on the Exercise of Fisheries in Coastal Waters, 2008) contains details and implementing regulations for the Schleswig-Holstein Fisheries Law.

The **Gesetz zum Schutz der Natur** (State Nature Conservation Law, 2010) has the same objectives as the Federal Nature Conservation Law but on state level.

The **Gesetz zum Schutze des schleswig-holsteinischen Wattenmeeres** (State Law on the Conservation of the Wadden Sea, 1999) is the basis for the creation of the National Park Schleswig-Holstein Wadden Sea.

The **Programm zur Bewirtschaftung der Muschelressourcen im Nationalpark "Schleswig-Holsteinisches Wattenmeer" gemäß § 40 Landesfischereigesetz vom 04. Juli 2006** (Mussel Programme Schleswig-Holstein Wadden Sea) of the Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume (Ministry for Energy Transition, Agriculture, Environment and Rural Areas; MELUR) defines in detail roles and responsibilities of involved organisations and individuals.

3.5.3 Area of operation

The fishery and culture is executed in the Schleswig-Holstein coastal waters between the Danish boarder in the north and the State boarder between Schleswig-Holstein and Lower Saxony in the south. The whole area is situated in the National Park Schleswig-Holstein Wadden Sea. All operations take place within the 12 nm zone and are governed by Schleswig-Holstein legislation.

The harvested mussels are landed in Hörnum/Sylt and then transported to Yerseke/NL by road.

3.5.4 Stakeholders in the fishery

The six mussel fishing companies and their association, the Erzeugerorganisation schleswig-holsteinischer Muschelzüchter e.V (PO of the Schleswig-Holstein mussel cultivators), are of course the principle party interested in this fishery.

Key stakeholders include the representatives of nature conservation organisations, including on the one hand the representatives of the State environmental administration and the National Park administration, and on the other the representatives of nature conservation NGOs, such as WWF Germany, NABU Schleswig-Holstein etc. (4.4.1 for details of stakeholder consultations).

After years of conflict between the Administration, the fishery and the NGOs the so-called “Eckpunktevereinbarung” (Framework Agreement) has been signed in July 2015 by the Administration, the PO and 5 NGOs. This agreement provides the basis for cooperation rather than conflict between the fishery and conservation interests. The Agreement comes into force on 1st January 2017.

Another stakeholder is the shrimp fishery, operating in the same areas as the mussel fishery/culture. There are no signs of conflicts; there is even a good cooperation because shrimp fishers report if they detect mussel beds. The only interference exists on the culture plots, from which the shrimp fishery is excluded if mussels are present.

3.5.5 Management and consultation

The basis for the management of the mussel fishery and culture is the “Programm zur Bewirtschaftung der Muschelressourcen im Nationalpark "Schleswig-Holsteinisches Wattenmeer" (Mussel Programme Schleswig-Holstein Wadden Sea) from 2006 aiming at a sustainable and nature-friendly exploitation of the mussel resources. The most important measures taken are listed here:

(i) The seed mussel fishery is restricted to the subtidal region (below mean lower low water) at four defined areas
(ii) Landing of mussels is forbidden from 15/04 to 30/06 every year
(iii) Landing of seed mussels is not permitted
(iv) Size of culture area is fixed and was reduced every 4 years until it reached the current size of 2,000 ha
(v) Residence time of seed mussels on the plots is fixed
(vi) Monitoring & Control system is in place for the fishery
(vii) Number and term of licences is fixed

Some further details are fixed in a contract under public law, signed from the competent Ministry (MELUR) and the six fishing companies

The Framework Agreement mentioned above includes restrictions that are going beyond the dispositions of the Mussel Programme:

(i) No seed mussel fishery in Zone 1 of the National Park
(ii) Defined areas in Zone 2 are free of culture plots
(iii) Reefs reported by MELUR cannot be fished
(iv) Size of culture plots is reduced to 1,700
(v) 250 ha of this area can be used for SMA

The consultation process is led by the Ministry that takes its decisions based on scientific advice. Licences for seed mussel fishery and for culture plots are limited in number and allocated for several years, the Mussel Programme and the Framework Agreement are valid for 15 years. All this offers a planning reliability for the fishermen

The Ministry invites the parties for an annual meeting in order to discuss success or possible problems in the implementation of the Framework Agreement.

4 Evaluation Procedure

4.1 Harmonised Fishery Assessment

A review of other MSC overlapping fisheries was completed prior to announcing the fishery. The team looked at other mussel fisheries certified and in assessment in the Wadden Sea (

Table 4).

Since Principle 1 was not scored for this fishery (see Section 0), harmonisation of P1 does not apply here.

In relation to Principle 2, since the Wadden Sea is the same ecosystem and mussel and husbandry techniques are broadly similar, similar scores might be expected. There are, however, differences between fisheries (e.g. regulatory requirements, differences in gears etc.) which mean that strict harmonisation is not appropriate. The team, however, reviewed the scoring of Principle 2 as relevant, and to ensure that any differences in outcome between the fisheries can be explained by genuine differences in the regulation or operation of the fishery (

Table 5). Note that the assessment of the Lower Saxony fishery concluded that movement of mussels within the Wadden Sea ecosystem could be considered translocations; the MEC assessment team for this fishery, however, has concluded that movement of mussels within the Schleswig-Holstein Wadden Sea (the only level of movement permitted in this fishery) does not constitute 'translocation' according to MSC's definition (see FCR version 1.3, Annex SB) for the reasons explained in Section 0. The 'translocation' UoA of the Lower Saxony fishery is therefore not included in

Table 5. Likewise the ‘on-growing’ UoA of the Netherlands suspended culture (culture in suspended ‘socks’) is not relevant to this fishery.

In relation to Principle 3, it is clear that the management framework for the Dutch fisheries is different, since they are in a different jurisdiction. Likewise, since management of mussel fisheries in Germany is at state rather than federal level, the management jurisdictions and regulations for this fishery are different from those in Lower Saxony – the National Parks are likewise different. No harmonisation was therefore required for Principle 3.

Table 4. Fisheries in the MSC programme which may overlap with this fishery

Fishery name	Status	PCR reference	MSC Requirements assessed under	Overlapping element
Germany Lower Saxony mussel dredge and mussel culture	Certified – Year 2 surveillance took place in October 2015	FCI, 2013	v1.2	Parts of P2 (same ecosystem, similar gear, different regulations)
Mussel translocation into the Oosterschelde	Certified – Newly certified in February 2016	MEC, 2016	v1.3 (version 2.0 process)	none (no translocation in this fishery)
Netherlands blue shell mussel fishery (bottom culture)	Certified - under reduced reassessment with the fishery below	SGS, 2011a	FCM v6	parts of P2 (same ecosystem, similar gear, different regulations)
Netherlands suspended culture mussel	Certified - under reduced reassessment with the fishery above	SGS, 2011b	FCM v6	parts of P2 (use of suspended culture elements)

Table 5. Outcome of Principle 2 for this fishery and the overlapping fisheries identified above, with explanation of any differences

PI	This fishery (all UoAs[4])	Lower Saxony (LS) (seed dredging UoA)	LS (SMA UoA)	Netherlands bottom (seed dredge UoA)	Netherlands bottom (SMA UoAs[5])	Netherlands bottom (culture plot UoA)	Netherlands suspended (SMA UoAs)	Differences?
2.1.1	100	100	100	100	100	100	100	
2.1.2	100	100	100	100	100	100	100	
2.1.3	100	80	80	80	80	80	80	
2.2.1	80	100	100	80	100	80	80	
2.2.2	80	80	80	80	80	80	80	
2.2.3	80	80	80	80	80	80	80	
2.3.1	90	80	80	80	90	80	90	
2.3.2	85	80	80	85	80	80	80	
2.3.3	80	80	80	80	85	80	80	
2.4.1	95	60	80	60	90	80	90	LS: No closed subtidal areas, limited monitoring ; Neth: awaiting outcome of PRODUS project (now complete)
2.4.2	85	60	80	85	85	85	80	LS: Limited management of subtidal area
2.4.3	80	75	75	85	80	80	80	LS: Limited monitoring of subtidal mussels
2.5.1	100	80	80	80	80	80	80	
2.5.2	95	80	80	80	80	80	80	
2.5.3	90	80	80	85	75	75	80	Neth. bottom: Work required to address proposed increase in SMAs (now complete)

[4] Although the scoring was separated by UoA where relevant and the scores for some individual scoring elements or issues were different, the overall scores for each PI worked out to be the same in all cases.
[5] The Dutch assessments makes a distinction between rope SMAs and net SMAs, but the scores are identical for all PIs.

4.2 Previous assessments

A previous assessment of this fishery was started by the CAB SGS Nederland BV in November 2011. This assessment was never completed and was withdrawn before the Public Comment Draft Report (PCDR) was published. There are no published materials in the public domain.

4.3 Assessment Methodologies

This fishery was assessed using the MSC Fisheries Certification Requirements version 2.0, both for the procedural stages and the scoring.

Annex SB (modifications to the default tree for enhanced bivalve fisheries) was used. Following the requirements of this standard, the impact of the fishery on the parent stock, and the use of translocations were evaluated (see Section 0). It was concluded that as the fishery does not involve translocations and there is no evidence that the fishery negatively impacts the parent stock, Principle 1 did not need to be scored (SB2.1).

The Risk Based Framework was used to identify and where applicable score primary and secondary species under Principle 2. The rest of Principle 2 and Principle 3 was scored using the Default Assessment Tree.

The reporting template used is the Full Assessment Reporting Template: Enhanced Bivalve Fisheries, available on the MSC website.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits and Consultations

The site visit for this initial certification took place between the 12th and 15th January 2016. The entire team attended the meeting (Jo Gascoigne, Ulf Löwenberg and Kat Collinson). In addition, a lead assessor from ASI, Colin Brannen attended the site visit to complete a witness audit on the MEC assessment team.

On-site activities comprised of client meetings in Kiel, Germany during the afternoon of the 12th January 2016. The assessors met with Dr Maarten Ruth at the Landesamt für Landwirtschaft, Umwelt und ländliche Räume (Fischerei) (State Agency for Agriculture, Environment and Rural Areas – Fisheries) on the morning of the 13th January, in Kiel, to collect information about the management of the fishery, vessel compliance through VMS and the benthic environment affected by the fishery. The team then travelled to Sylt, where the fishery operates in north-west Germany, near the Danish border. The team visited the fishing port on the 13th January upon arriving in Sylt. This was deemed the best location to meet with stakeholders wanting to participate in the fishery certification process. A meeting to listen to stakeholders was undertaken on the morning of the 14th January. In the afternoon, the same stakeholders took part in the Risk Based Framework (RBF) meeting conducted by the team.

A full list of representatives consulted during the assessment process is given below in Table 6. The team would like to thank all these people for giving up their time to support the assessment.

Table 6. Stakeholders consulted during the fishery assessment

Name	Role/organisation	Type of consultation	Date/location of consultation	Information obtained
Mr Simon Leuschel	Client Group	Information gathering	12-14th January at various locations	Client operations, traceability, general information, catch data
Dr. Maarten Ruth	Landesamt für Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein	Information gathering	13th January at Office of LLUR in Flintbek	Management of fishery, benthic impacts – specifically benthic substrates and fishing effects, VMS
Heike Büttiger	Bioconsult Schleswig-Holstein GmbH & Co.	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Paul Wagner	Muschelzüchter (mussel grower)	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
André de Leeuw	Muschelzüchter (mussel grower)	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Rainer Borcherding	Schutzstation Wattenmeer	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Katerina Weinberg	Schutzstation Wattenmeer	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Harald Förster	Schutzstation Wattenmeer	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Hans-Ulrich Rösner	WWF	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop

Name	Role/organisation	Type of consultation	Date/location of consultation	Information obtained
Martin Momare	Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Vivien Kudelka	MSC	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Svenja Zakszewski	Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Britta Diederichs	National Park Schleswig Holstein Administration	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Stephanie Borchardt	Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume Schleswig-Holstein	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop
Colin Brannen	ASI	Information gathering	14th January – Schutzstation Wattenmeer in Hörnum/Sylt	Stakeholder meeting and RBF workshop

At key stages of the assessment process, stakeholders were contacted and provided with an opportunity to comment (for a full list of stakeholders, please see Appendix 6). Stakeholders were contacted at the following stages:

a. Fishery announcement, site visit notification and Assessment Team: 3rd December 2015
b. Assessment timeline: 3rd December 2015
c. Use of the Risk Based Framework: 3rd December 2015
d. Proposed Peer Reviewer: 14th April 2016

Emails sent directly to notify stakeholders of the assessment included the following MSC documents: “Toolbox for Stakeholder Participation in RBF assessments”, MSC Template for Stakeholder Inputs” and “guide to MSC”.

4.4.2 Stakeholder comments during evaluation

No stakeholder comments were received prior to the site visit, however WWF asked to join the stakeholder meeting on the 14th January in Sylt. MEC provided the meeting details and took account of the stakeholder concerns during that day. Subsequent to the site visit, further information was received in writing from the National Park Authority (email from Britta Diederichs to Ulf Löwenberg, 30 March 2016), providing a habitat map, a scientific report about stability of subtidal mussel beds and the most recent monitoring report for eider ducks – all of these have been incorporated into the scoring and into this report.

4.4.3 Evaluation Techniques

a) Media announcements

The fishery's assessment was announced on the MSC website on the 3rd December 2015. The MSC press release targeted a wide range of stakeholders within the sustainable seafood industry.

b) Methodology for information gathering

Information for the assessment was gathered during the site visit and through separate consultation and correspondence with individual stakeholders. The PO representatives listed in Table 6 were key in providing most of the information regarding the operation and management of the fishery. Catch data for the fleets under assessment were obtained from the fishery client group.

c) Scoring

Scoring was completed on a Skype call with all members of the team. Each PI was reviewed collectively and a group consensus determined. The scores were decided as follows:

How many scoring issues met?	SG60	SG80	SG100
All	60	80	100
Half	FAIL	70	90
Less than half, most not met	FAIL	65	85
More than half, many or most	FAIL	75	95

Note that where there is only one scoring issue in the SG, the issue can be partially scored – in this case the team used their judgement to determine what proportion of it was met, e.g. at the 100 level, a small part met = 85, about half met = 90, nearly all met = 95.

d) Decision rules for final outcome

The decision rule for MSC certification is as follows:

1. No PIs scores below 60;
2. The aggregate score for each Principle is 80 or above.

The aggregate score for each Principle is calculated by taking the average score for each component followed by the average of all the component scores (see Table 11).

Table 7. Scoring elements

Component	Scoring elements	Main/not main	Data-deficient or not
1 – Target species/stock (UoA 1 & 2)	Wadden Sea mussels	Target	N/A (P1 not scored)
2.1 – Primary Species	None	N/A	N/A
2.2 – Secondary Species	Green shore crab (*Carcinus maenas*)	Not main	Yes
	Common Starfish (*Asterias rubens*)	Not main	Yes
2.3 – ETP species	Eider ducks, harbour seals, harbour porpoise	N/A	No
2.4 – Habitats	Sand / mud	Main	No
	Natural subtidal mussel beds	VME	No

e) Use of the Risk Based Framework (RBF)

The RBF was used in this assessment. The team used Table 3 – "Criteria for triggering the use of the RBF" from the MSC CRs v2.0. The conclusions are summarised in Table 8 below.

Table 8. Conclusions for using RBF in this assessment

Performance Indicator	RBF triggered	Reasoning
1.1.1	No	Principle 1 is not being scored due to SB2.1.4 of the MSC Certification Requirements (v2.0) – see Section 3.3
2.1.1	No	No primary species interacting with the fishery
2.2.1	Yes	No information available on stock status of secondary species caught in this fishery, no reference points.
2.3.1	No	Information available on population status of relevant ETP species
2.4.1	No	Information is sufficient to determine the habitats encountered in the fishery and also there is

		information on the impact of the fishery on the habitats encountered
2.5.1	No	Information is sufficient to support an analysis of the impact of the fishery on the ecosystem

A wide range of stakeholders were identified and contacted to ensure effective stakeholder participation. This can be seen from the list of stakeholder participants listed in Table 6.

A stakeholder list was compiled between the CAB and the client group. Stakeholders were contacted either by email or phone.

The assessment team did not receive any comments specifically regarding the use of the RBF for this assessment.

The results of the RBF meeting were recorded in the form of an online questionnaire using SurveyMonkey (www.surveymonkey.com)[6]. The components discussed, as well as the information and opinions obtained during the stakeholder meeting is provided in the questionnaire output in Appendix 3.

[6] The team would like to thank Jim Andrews for making this possible.

5 Traceability

5.1 Eligibility Date

The eligibility date for this fishery is the date of certification.

5.2 Traceability within the Fishery

Once mussels are determined to be of commercial size on a client's plot, the vessels are sent out for harvesting. Plots are marked by flags and posts and GPS co-ordinates. Each fisher knows which plots are theirs and therefore where they are licensed to harvest. Rope culturing areas are located separately to seed-dredging areas, which are again marked and known to the fishers.

Seed mussels are either dredged and relayed onto culture plots and harvested at commercial size (UoA 1) or collected on ropes and grown to ~4cm and then relayed onto culture plots for commercial harvest (UoA 2). Ropes are hung in spring and sometimes brushed intermediately when the weight of mussels are too heavy for the ropes.

As per EU regulations, each vessel must fill out the electronic logbook for all the fishing days (Fisch Tage Buch). In addition to this, each vessel is equipped with a VMS 'black box', which logs all movements in 'real time', including whether or not the vessel is fishing. Pressure sensors on the winches are used to do this. The assessment team saw the VMS working in practice when they visited the Office of Rural Areas, Fisheries Department in Kiel and confirm this as a robust, monitoring & compliance system in operation in the fishery (better than standard fishing-vessel VMS in that vessels are pinged more frequently and it is possible to tell directly whether or not a vessel is fishing rather than inferring it from vessel speed). Recording is continuous while the vessels are at sea (not by satellite VMS as per the Common Fisheries Policy, but a German fishery monitoring system). Mussel plots are dredged and mussels are brought on-board where they are placed in open bags. Each bag takes up to 1100 kilograms. No processing of any description takes place on board.

A registration document is also completed, a requirement of fishery management (the state office for fisheries) in Schleswig-Holstein. Information on this document includes harvesting vessel, date of harvest, destination of the mussels, whether they are wild or cultured-caught mussels, quality status of the production area and position of the harvest area (fishing ground). In addition, each document has its own registration number.

Upon landing at port, the bags of mussels are loaded onto transport vehicles. Landings from different boats are never placed in the same transport vehicle, stopping the risk of mixing of mussels from different mussel producers. A sample is taken from the truck for the customer. Based on this sample, the customer will buy the consignment. This is where change of ownership occurs. The mussels are then transported to Yerseke in Holland, for collection.

Upon arriving in Yerseke, the shipment is unloaded and placed into water containers. Each container has a number and these containers are maintained by the auction. The mussels

remain in these containers until they are collected by the transport company, which takes them on to the first customer. Please note that ownership has already changed by the time they arrive in Yerseke and the team have provided the information in this paragraph to ensure a complete knowledge of the process.

A copy of the registration document mentioned above, is provided with the customs and delivery documentation to the customer. This document is the key piece of traceability paperwork that follows the mussels from harvest to the next customer.

The VMS and documentation that must be completed as part of the requirements set by the Schleswig-Holstein management authority (state office for fisheries) and the EU regulation to complete an electronic logbook provides a very strong traceability system in this fishery. Using this combination of systems, mussel consignments can be tracked back to the day, vessel and area that they were harvested.

Table 9. Traceability Factors within the Fishery

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear to be used within the fishery	National park legislation doesn't allow the use of other gears so there is no chance of this occurring. Harvesting is done on a plot by plot basis also. Only the licenced owners of the plots can fish in the mussel areas on their own plots.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	The vessels will only fish on their plots for the mussels. Not allowed to fish on other peoples' areas. As above, there is no chance as there are no natural beds that can be fished, as the vessel operations are bound by the areas set and restricted by the National Park. Each plot is numbered and documentation including plot, estimated weight and harvest date is completed and accompanies each harvest 'batch'. The VMS system, described above, also provides clear evidence of where the mussels have been collected, and their trip details.
Potential for vessels outside of the UoC or client group fishing the same stock	Only licensed vessels can fish on their own licensed plots. These areas are also bound by the areas of the National Park. As above, there is no chance of this occurring.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at	All mussels in UoC/A will be certified. They are harvested from the ropes, straight onto the vessels. On-board, they are placed in open bags, but they are

sea and on land, points of landing, and sales at auction)	removed from the vessel straight to the transport vehicle, which marks the change of ownership. Transport vehicles will never transport catch from different vessels, i.e. one vessel's catch per transport truck.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	There are no processing activities under the fishery certificate, which covers dredging, relaying and harvesting only. Any processing occurs after a change of ownership and is not the responsibility of the fishery. Again there is no risk of this occurring. All mussels in the area are undergoing certification, so 100% would be certified anyway.
Risks of mixing between certified and non-certified catch during transhipment	Transhipment at sea is not permitted by the EU in Community waters (Article 20 of Council Regulation (EC) No 1224/2009). All mussels in the area are undergoing certification, so 100% would be MSC (pending successful certification) and therefore cannot be mixed with non-certified mussels. Lastly, the fishery operates by each boat unloading at port. Each consignment comes straight off the boat onto transport vehicle to Yerseke.
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	None foreseen. All mussels in the area are undergoing certification, so 100% would be MSC (pending successful certification).

5.3 Eligibility to Enter Further Chains of Custody

The following products have been determined eligible to enter further certified chains of custody as MSC certified and carry the MSC ecolabel: blue mussels (*Mytilus edulis*) caught by vessels owned by the client group in the German part of the Wadden Sea off the west coast of Schleswig-Holstein after the eligibility date, pending a successful MSC assessment by the MEC assessment team.

Table 10 lists the current vessels owned by the client group and that are eligible to take part in this fishery.

Table 10. Client group vessels eligible to sell MSC mussels under this assessment

Name	PLN	Tonnage	LOA	Operator
Johanna Leintje	WYK 2	419 t	43.42 m	Andre de Ronde
Trijntje	WYK 3	377 t	43.38 m	Jan Schot
Capella	WYK 5	217 t	35.60 m	Pascal de Leeuw
Adriaan	WYK 7	187 t	36.22 m	Olaf Kleye
Wattenläufer	WYK 8	280 t	39.99 m	Sieb Kuiper J. Tanis
Simon Alexander	WYK 9	406 t	43.59 m	Adriaan Leuschel
Royal Frysk	HOO 70	345 t	45.54 m	David de Leeuw
Siebennus Gerjets	HOO 71	221 t	38.65 m	Julien de Leeuw
Janne	YE 23	221 t	42.30 m	Andreas Iden

The point of intended change of ownership in this fishery is the point at which the mussels are landed and loaded onto a logistics vehicle, and the customer, having sampled the harvested mussels, accepts the consignment and purchases the mussels. Separate chain of custody is required at this point as ownership has changed hands prior to the mussels arriving in Yerseke.

There are two ports of landing used by the fishery; Hörnum on Sylt and Dagebüll, on the west coast of the Schleswig-Holstein mainland.

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

This fishery does not involve IPI stocks.

6 Evaluation Results

6.1 Principle Level Scores

Table 11. Final Principle Scores

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species	Not scored
Principle 2 – Ecosystem	89.3
Principle 3 – Management System	92.5

6.2 Summary of PI Level Scores

Component	Weight	Performance Indicator		Weight	Score
Primary species	0.2	2.1.1	Outcome	0.333	100
		2.1.2	Management strategy	0.333	100
		2.1.3	Information/Monitoring	0.333	100
Secondary species	0.2	2.2.1	Outcome	0.333	80
		2.2.2	Management strategy	0.333	80
		2.2.3	Information/Monitoring	0.333	80
ETP species	0.2	2.3.1	Outcome	0.333	90
		2.3.2	Management strategy	0.333	80
		2.3.3	Information strategy	0.333	80
Habitats	0.2	2.4.1	Outcome	0.333	95
		2.4.2	Management strategy	0.333	85
		2.4.3	Information	0.333	80
Ecosystem	0.2	2.5.1	Outcome	0.333	100
		2.5.2	Management	0.333	95

Component	Weight	Performance Indicator		Weight	Score
		2.5.3	Information	0.333	90
Governance and policy	0.5	3.1.1	Legal &/or customary framework	0.333	100
		3.1.2	Consultation, roles & responsibilities	0.333	85
		3.1.3	Long term objectives	0.333	100
Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	100
		3.2.2	Decision making processes	0.25	85
		3.2.3	Compliance & enforcement	0.25	95
		3.2.4	Monitoring & management performance evaluation	0.25	80

6.3 Summary of Conditions and Recommendations

No conditions are proposed.

One non-binding recommendation is proposed in relation to PI 2.2.3 (as suggested by one of the peer reviewers). It is recommended that the fishery conduct an inventory of the species harvested alongside the mussels.

6.4 Determination, Formal Conclusion and Agreement

(REQUIRED FOR FR AND PCR)

1. The report shall include a formal statement as to the certification determination recommendation reached by the Assessment Team about whether or not the fishery should be certified.

(Reference: FCR 7.16)

(REQUIRED FOR PCR)

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

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Appendices

Appendix 1 Scoring and Rationales

Appendix 1.1 Performance Indicator Scores and Rationale

Note: Principle 1 has not been scored (see Section 3.3 for further detail)

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1		**The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guidepost	Main primary species are **likely** to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are **highly likely** to be above the PRI OR If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY.
	Met?	Y	Y	Y

	Justification	UoA1 and UoA2: According to the results of the stakeholder consultation (RBF), there was general agreement that there are no primary species in this fishery (see Appendix 3). Therefore SG100 is met by default.		
b	Minor primary species stock status			
	Guidepost			For minor species that are below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	Met?			Y
	Justification	No primary species, so met by default.		
References		RBF (Appendix 1.2); output of stakeholder workshop (Appendix 3)		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to above the point where recruitment would be impaired.	There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	Y	Y	Y
	Justification	UoA1 and UoA2: There are no primary species in this fishery. A strategy is therefore not necessary, so SG80 is met by default. In relation to SG100, because there are no primary species, whether major or minor, SG100 is met by default.		
b	Management strategy evaluation			
	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 measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y

	Justification	No primary species, so SG100 met by default		
c	Management strategy implementation			
	Guidepost		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		Y	Y
	Justification	No primary species, so SG100 met by default		
d	Shark finning			
	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	No sharks taken as primary species, whether major or minor		
e	Review of alternative measures			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.

	Met?	Not relevant	Not relevant	Not relevant
	Justification	No unwanted catch of primary species		
References		RBF (Appendix 1.2.1), stakeholder workshop (Appendix 3)		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main species			
	Guidepost	Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status.
	Met?	Y	Y	Y
	Justification	UoA1 and UoA2: No primary species, whether major or minor, so SG100 is met by default.		
b	Information adequacy for assessment of impact on minor species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.

	Met?	Y	Y	Y
	Justification	No primary species, whether major or minor, so SG100 is met by default.		
c	Information adequacy for management strategy			
	Guidepost	Information is adequate to support **measures** to manage **main** primary species.	Information is adequate to support a **partial strategy** to manage **main** Primary species.	Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree of certainty** whether the strategy is achieving its objective.
	Met?	Y	Y	Y
	Justification	No primary species, whether major or minor, so SG100 is met by default.		
References		RBF (Appendix 1.2.1), stakeholder workshop (Appendix 3)		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biological based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guidepost	Main Secondary species are **likely** to be within biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are **highly likely** to be above biologically based limits OR If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main secondary species are within biologically based limits.
	Met?	Y	Y	N

	Justification	UoA1 and UoA2: This PI was scored using the RBF. Stakeholders identified possible 'main' secondary species as starfish (*Asterias rubens*) and green crabs (*Carcinus maenas*). A PSA was conducted for both species, based on the responses given at the RBF workshop (14 Jan. 2016, Sylt) (Appendices 1.2.1 and 3). The outcome scores were as follows: starfish: 88; green crabs: 96 Because only possible 'main' secondary species were considered in the RBF scoring, rather than all possible bycatch species, the final score for this PI cannot be higher than 80 (FCR PF5.3). This applies to both UoAs because although a lower number of predators is likely to be present with mussels from the seed collectors (UoA2) relative to mussels coming from the seed beds (UoA1), predators are also present on the culture beds – i.e. are a bycatch at point of final harvest (UoA1 and UoA2).		
b	**Minor secondary species stock status**			
	Guidepost			For minor species that are below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			N
	Justification	No minor secondary species were identified during the RBF workshop, although presumably there are some.		
References		RBF (Appendix 1.2.1), Appendix 3		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2		**There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place**			
	Guidepost	There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **strategy** in place for the UoA for managing main and minor secondary species.
	Met?	Y	Y	N

	Justification	UoA1 and UoA2: The team considered there is a 'partial strategy' in place to minimise bycatch in this fishery overall (both UoAs), with the following key elements: • Bycatch taken from fishing on seed mussel beds and the seed collectors is re-laid directly on the culture plots where the same habitat type and conditions (subtidal mussel beds) are present (with the exception of starfish – see below); • Bycatch taken from harvesting of the culture plots is subject to a washing / sorting procedure which aims to get rid of as much bycatch as possible; this bycatch is put back over the side in areas where it is likely to survive; • Starfish are removed from the catch as far as possible (both from seed and from harvest) and returned to the sea outside the culture or fishing area (to try and minimise starfish predation on the culture plots). • One of the purposes of the increasing use of the seed collectors (as agreed in the Framework Agreement) is to ensure that the ecology of subtidal mussel beds can be maintained intact. The team considered that, in general terms, given that starfish and green crabs are widespread and abundant species, this fishery is highly unlikely to have sufficient impact to alter their stock status in any way, but that this 'partial strategy' made impacts even less likely (even at a local level). The team considered that it does not constitute a full 'strategy' for the following reasons: • Not all bycatch is removed in sorting and washing; • There is most likely some mortality, perhaps from crushing while on-board the boat, or from handling or stress, or if animals are returned to an area which is less suitable (having less food); • It does not necessarily consider all 'minor' secondary species. The score is therefore 80.		
b	Management strategy evaluation			
	Guidepost	The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.

	Met?	Y	Y	N
	Justification	Based on knowledge of the general ubiquity of the two species concerned in coastal ecosystems around the southern North Sea (and further afield) (e.g. see BIOTIC references), the team had confidence that the partial strategy will work, in that the fishery is highly unlikely to have any significant impact on populations of these species. Stakeholders during the RBF workshop agreed, although they noted that the fishery may affect local distributions (e.g. removals via fishing, attraction to the mussel lays as a source of food). SG80 is met. In relation to SG100, although the team had 'high confidence' of a lack of significant impact, there is nothing that would constitute 'testing', so SG100 is not met in full.		
c	Management strategy implementation			
	Guidepost		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		Y	N
	Justification	There is no direct evidence (such as observer reports) as to the actions of the mussel fishermen in relation to starfish and green crabs. It is important to note, however, that the 'partial strategy' as set out above is in the best interests of the mussel fishers as well as the bycatch species. For the end product of harvested mussels, payment is made according to the tonnage and the proportion made up of mussels based on a subsample. If the subsample includes some animals other than mussels, the proportion of the weight they make up is scaled up to the full sample – e.g. if the subsample is 5% crab by weight, the fishermen would receive payment for only 95% of the tonnage. It is therefore worthwhile to remove as much bycatch as possible. It is also important to remove these animals, particularly starfish, from the seed prior to relaying, because otherwise predators are introduced to the culture plots; starfish predation already causes significant losses. On this basis, the team considered that there was reasonable evidence that the fishermen were likely to act as advertised; SG80 is met. There is not, however, clear objective evidence such as observer reports, so SG100 is not met.		

d	Shark finning			
	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	No sharks involved.		
e	Review of alternative measures to minimise mortality of unwanted catch			
	Justification	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate.
	Met?	Not relevant	Not relevant	Not relevant
	Guidepost	Definition of 'unwanted catch' for a fishery without a specific management plan: GSA3.1.6: *Unwanted catches of species may also be designated as catch that is prohibited in that fishery. Unwanted catch may also include the part of the catch that has been thrown away or slipped where the components of that catch may not survive after release*. The catch of starfish and green crabs is unwanted. It is not, however, prohibited, and is replaced in the sea with, presumably, high survival (although probably not 100%). It therefore does not meet the definition of 'unwanted catch' as set out above. The team therefore concluded that this is not relevant here.		

References	RBF (Appendix 1.2.1); Framework Agreement – Germany, 2015; BIOTIC: common starfish: http://www.marlin.ac.uk/biotic/browse.php?sp=4137&show=distribution; green crab: http://www.marlin.ac.uk/biotic/browse.php?sp=4286&show=distribution
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER:	**N/A**

Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3		**Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guidepost	Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status.
	Met?	Y	Y	N

	Justification	The RBF was used for 2.2.1, so the alternative wordings are used here. Qualitative information is available to estimate productivity and susceptibility attributes for the main secondary species (see Appendix 1.2.1). SG60 is met. In relation to SG80, quantitative information is available to score productivity (see references given in Appendix 1.2.1). The main problem for scoring susceptibility is not so much a lack of information on distribution, since both species are known to be ubiquitous around coasts of NW Europe (see for example BIOTIC entries), but rather a difficulty in evaluating what constitutes a 'stock' for these species. Distribution is continuous rather than patchy, so presumably connectivity between sites is a decreasing function of distance and variable over time, making it impossible to delineate discrete 'stocks'. Because of this difficulty, susceptibility was scored based on stakeholder input (see Appendix 1.2.1 – RBF and Appendix 3 – stakeholder workshop outcome). The team concluded, however, that the information available was sufficient to ensure a precautionary scoring for the PSA, and therefore that SG80 was met. SG100 is not met.		
b	**Information adequacy for assessment of impacts on minor secondary species**			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			N
	Justification	No attempt has been made to identify 'minor' secondary species.		
c	Information adequacy for management strategy			

	Guidepost	Information is adequate to support **measures** to manage **main** secondary species.	Information is adequate to support a **partial strategy** to manage **main** secondary species.	Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**.
	Met?	Y	Y	N
	Justification	As argued above, the team considered that there is a 'partial strategy' in place to minimise the impact on main secondary species. This partial strategy does not really rely on information about the species concerned; it is based on their physical removal from the catch and replacement in the ecosystem, as well as the use of seed collectors to minimise ecological impact and the limited footprint of the fishery. SG80 is met. SG100 is not met, because (among other things) not all secondary species are involved. Further to the recommendation of a peer reviewer, a recommendation is proposed for an inventory of secondary species associated with mussel harvest.		
References		RBF (Appendix 1.2.1) and output of stakeholder workshop (Appendix 3); BIOTIC: common starfish: http://www.marlin.ac.uk/biotic/browse.php?sp=4137&show=distribution; green crab: http://www.marlin.ac.uk/biotic/browse.php?sp=4286&show=distribution		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
ONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1		**The UoA meets national and international requirements for the protection of ETP species** **The UoA does not hinder recovery of ETP species**		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and **likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population/stock are known and **highly likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits.
	Met?	Y	Y	N
	Justification	UoA1 and UoA2: There is no evidence (nor a realistic probability) of mussel dredges having a direct impact on any of the ETP species known to occur in the area. Since any killing of these species is forbidden, the team concluded that there is a limit of zero direct mortality, and scored this scoring issue on that basis. ETP species interacting with this fishery have been identified by stakeholders and the team as eider duck, common and grey seal and harbour porpoise (see Section 3.4.3). All these species are protected under National Park rules; eider duck are also protected under the Birds Directive, harbour porpoise under Schleswig-Holstein law and ASCOBANS and the seals under the Wadden Sea Seal Agreement and associated management plan (2012-16). The team concluded that the impacts of the fishery are 'highly likely' to be within the limits (i.e. highly likely to be zero direct mortality), based on how the fishery operates and the views of stakeholders (including representatives of the National Park) during the site visit. SG80 is met for both UoAs. There is not, however, a 'high degree of certainty' because direct information (e.g. from observers) is lacking, so SG100 is not met.		

b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Known direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Y	Y	Y
	Justification	UoA1 and UoA2: As noted above, there is no evidence (nor a realistic probability) of mussel dredges having a direct impact on any of the ETP species known to occur in the area. Eider ducks: The population in the Wadden Sea has declined significantly in recent years (see Section 3.4.3), so recovery is relevant. This scoring issue considers 'direct effects' – i.e. direct mortality or injury from the fishery. The team concluded that this is not at all likely – eider ducks are relatively shy and will keep a distance from fishing vessels such that it is extremely unlikely that an eider duck would ever be caught in a mussel dredge or otherwise directly impacted by fishing activities. SG100 is met. Common seal: Common seal populations have been increasing the Wadden Sea since the mid-1970s (with some reverses caused by disease outbreaks) (Galatius et al. 2014), so it is clear that their recovery is not being hindered. SG80 is met. In relation to SG100, stakeholders again identified some minor concerns regarding possible negative interactions, particularly with the seed collectors (UoA2) – this will be evaluated in the appropriate assessment. Overall, however, given the population trajectory for common seal, the team had a 'high degree of confidence' that the fishery is not having any significant detrimental effects. SG100 is met. Grey seal: Grey seal numbers are very low in Schleswig-Holstein waters; most of the Wadden Sea population are in Dutch waters. Nevertheless, grey seal numbers in the Wadden Sea have also been increasing in recent years, as have the number of pups (Brasseur et al. 2015). The conclusion is the same as for common seal – SG100 is met. Harbour porpoise: There are no direct interactions between harbour porpoise and the fishery. SG 100 is met.		
c	Indirect effects			

	Guidepost		Indirect effects have been considered and are thought to be **highly likely** to not 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 – seals, harbour porpoise N – eider duck
	Justification	UoA1 and UoA2 Eider ducks: In the past, overfishing of mussel beds may have been a factor in the decline of eider ducks (Laursen et al., 2009; Camphuysen et al., 2002), but now it is thought that the fishery is more likely to enhance subtidal mussel biomass (via the culture plots and seed collectors) than to reduce it; therefore this is not likely to be a factor in hindering their recovery. There are a range of other threats to the NE Atlantic population (Birdlife International, 2015), although the population in the SH Wadden Sea appears to have been stable since 2000 (Figure 6). The team concluded on this basis that indirect effects of the fishery are 'highly likely' not to create unacceptable impacts. SG80 is met. Stakeholders did, however, express some concerns about disturbance having negative consequences for the condition of the ducks, particularly when moulting (when the ducks are very sensitive to disturbance) – for example, relaying, harvesting and culture operations on the plots will hinder them from being able to feed. On this basis, the team considered that there is not a 'high degree of confidence' that the fishery has no detrimental effects at all, so SG100 is not met. Seals: Stakeholders again identified some minor concerns regarding possible negative indirect interactions, particularly with the seed collectors (UoA2) – this will be evaluated in the appropriate assessment (currently underway by BioConsult as part of the Framework Agreement). Overall, given the population trajectory for seals (both species), the team had a 'high degree of confidence' that the fishery is not having any significant detrimental effects (whether via direct or indirect interactions). SG100 is met. Harbour porpoise: Stakeholders again expressed some minor concerns relating to disturbance via noise, which is being evaluated in the appropriate assessment. Given that the fishery makes up a small proportion of the vessel traffic in the Schleswig-Holstein Wadden Sea, the team again had a 'high degree of confidence' that there are no significant detrimental effects. SG 100 is met.		

References	Framework Agreement – Germany, 2015; Conservation and Management Plan for the Wadden Sea Seal Population, 2012-2016: http://www.waddensea-secretariat.org/sites/default/files/downloads/smp_2012-2016_final.pdf; Laursen et al., 2009; Camphuysen et al., 2002; Birdlife International, 2015 ; Galatius et al., 2014; Kampf, 2014 ; Brasseur et al. 2015
OVERALL PERFORMANCE INDICATOR SCORE:	**eider duck – 85** **seals and porpoise – 95** **overall – 90**
CONDITION NUMBER:	**N/A**

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2		**The UoA has in place precautionary management strategies designed to:** • **meet national and international requirements;** • **ensure the UoA does not hinder recovery of ETP species.** **Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guidepost	There are **measures** in place that minimise the UoA-related 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 UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species.
	Met?	Y	Y	N

	Justification	For discussion of 'national and international requirements' see 2.3.1a UoA1 and UoA2: The strategy for managing the impact of ETP species is summarised in the Framework Agreement as follows: • If a stable subtidal bed is found (<1 year class) it is closed to the fishery; • The fishery may only operate in certain areas (see map attached to Framework Agreement); this is part of the National Park zoning system but goes further • An appropriate assessment is underway which is considering impacts on ETP species. The agreement states that any issues raised by the assessment will be dealt with in the management of the fishery as required. The agreement is based on information from the fishery and also on input from conservation stakeholders as follows: • The state of Schleswig-Holstein represented by the Ministry of Energy Turnaround, Agriculture, Environment and Nuclear Safety • The Producer Organisation of the Schleswig-Holstein Mussel Fishermen • The State Nature Conservation Association • The Nature And Biodiversity Conservation Union Germany (NABU), Schleswig-Holstein branch • The Nature Protection Association "Schutzstation Wattenmeer" (Protection Station Wadden Sea) • The Association "Jordsand" for the protection of marine birds and of nature • WWF Germany Given that all these stakeholders have signed up to allow the fishery to operate within the parameters set out in the agreement, and subject to the outcome of an appropriate assessment, the team considered that it constitutes a 'comprehensive strategy' to minimise any impacts of the fishery on ETP species (indirect only, since direct impacts are considered implausible). The relevant requirements were considered by the team to be zero direct mortality or injury (see 2.3.1a). Since this is met, and the strategy addresses issues around potential indirect impacts not likely to lead to mortality, the team considered that it goes above the requirements, hence SG100 is met in relation to the Framework Agreement. The team noted, however, that the Framework Agreement has not yet come into force (1 January 2017). There are existing arrangement in place which fulfill part of the Framework Agreement already – i.e. the National Park zonation and other regulations for the protection of ETP species. The other elements of the Framework Agreement (additional closed areas, rules regarding persistent subtidal beds) are not yet 'in place' and the appropriate assessment is not yet completed. The team concluded that the 'comprehensive strategy' (Framework Agreement) is not yet in place, but the existing arrangements constitute a 'strategy' as required by SG80.

b	Management strategy in place (alternative)			
	Guidepost	There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
	Met?			
	Justification	(Scored above instead)		
c	Management strategy evaluation			
	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 measures/strategy will work, based on **information** directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work.
	Met?	Y	Y	N
	Justification	The team concluded that there is a strategy, as set out above. Information about the fishery (operation, footprint) gives high confidence that it will work – SG80 is met. The appropriate assessment may provide the 'quantitative analysis' required by SG100 but it was not finished at the time of writing, so SG100 is not (yet) met.		
d	Management strategy implementation			

	Guidepost		There is some **evidence** that the measures/strategy is being implemented successfully.	There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		Y	N
	Justification	The closed areas (and time periods) which are the key part of the existing management strategy are enforced via the 'black box' monitoring system, which is open to inspection in the offices of the SH Environment Ministry. Note that as well as showing where the vessels are located in real time, they are connected to the pumps and therefore show if the vessel is fishing or not. Most of the measures are already in place (e.g. zoning), constituting a 'strategy', but the Framework Agreement (which will provide a 'comprehensive strategy') does not come officially into force until the end of 2016. On this basis, the team concluded that most but not all of the comprehensive strategy is being implemented, although the team was confident that the Agreement would be fully implemented as required. Overall, the team concluded that SG80 is met but SG100 is not yet met, pending full implementation of the Framework Agreement and the results of the appropriate assessment.		
e	Review of alternative measures to minimize mortality of ETP species			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	There is not considered to be any direct UoA-related mortality of ETP species (from either UoA) (see arguments set out in 2.3.1). Therefore, this PI is not relevant.		

References	Framework Agreement and associated map – Germany, 2015; see also Figure 3; National Park website
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER:	**N/A**

Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3		**Relevant information is collected to support the management of UoA 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	Information adequacy for assessment of impacts			
	Guidepost	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species.	Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species.
	Met?	Y	Y	N

	Justification	None of the stakeholders thought that there was any direct mortality (death or injury) on any of the ETP species from the fishery, and although there is no direct evidence such as observer reports, it is difficult to see how this might happen given the characteristics of the fishing gear and the species concerned. Any impacts on these species are likely to be indirect (via disturbance or prey removal) and the population-level impact is difficult, perhaps impossible, to quantify, particularly given the other more significant threats to these populations. The fishermen have started a system of 'self-monitoring' (Eigenkontrolle) to report any interactions with birds, mammals, turtles or rare fish. No data are available from this at present, and the team did not know whether this was because no sampling had been done or because no interactions are reported. Nevertheless, by discussion with stakeholders, plausible argument and comparison with other similar fisheries, it is clear that UoA-related direct mortality on these species can be assessed quantitatively (i.e. zero), and on this basis it can be determined that the UoA is not a threat to their recovery or protection. SG80 is met. SG100 is not met (as regards indirect effects) and is probably impossible to meet.		
b	Information adequacy for management strategy			
	Guidepost	Information is adequate to support **measures** to manage the impacts on ETP species.	Information is adequate to measure trends and support a **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

	Justification	As argued above (PI 2.3.2) there is a comprehensive strategy in place to minimise fishery impacts on ETP species, which mainly relies on keeping the fishery out of certain areas. The overlap of the fishery with areas used by eider ducks (e.g. moult areas) and seals (haul outs) is reportedly known (according to stakeholders during the site visit). (Harbour porpoise are less likely to be concentrated in particular areas.) All three species are monitored (e.g. Markones and Garthe 2011, Galatius et al. 2014, Peschko et al. 2016). An appropriate assessment is underway but is not yet completed. On this basis, the team concluded that SG80 is met, since trends are measured and there is a strategy in place. In relation to SG100, while the team argues that there will be a 'comprehensive strategy' under the Framework Agreement, it is not yet in place, and in any case it is not possible to evaluate indirect impacts of the fishery (from disturbance) with a high degree of certainty, so SG100 is not met in full.
References		Eigenkontrolle datasheets; Markones and Garthe, 2011; Galatius et al., 2014; Peschko et al., 2016
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**N/A**

Evaluation Table for PI 2.4.1 – Habitats outcome

PI 2.4.1	**The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area(s) covered by the governance body(s) responsible for fisheries management.**		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		

	Guidepost	The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y – UoA1 N – UoA2

	Justification	Naturally-occurring habitats have been identified as follows: commonly-encountered habitat – subtidal sand and mud flats and ephemeral subtidal seed mussel beds; VMEs – permanent subtidal mussel beds ('biogenic reefs'); minor habitats – none. In relation to habitat impacts, there are three issues to consider: the impact of the mussel dredge on habitats while fishing for seed mussels, the impact of the seed collectors on habitats underneath the collectors, and changes in habitat on the culture plots. The Wadden Sea is a dynamic intertidal habitat, composed largely of sand and mudflats intersected by tidal channels which originate from the channels between the barrier islands (Figure 7, Figure 8). The channels and sandbanks may move from year to year, or following a big storm. Impacts from fishing gear (UoA1 and UoA2): shallow sand and mud habitats in general are not vulnerable to damage from towed fishing gear, since natural disturbance rates are high (particularly in tidal channels). The team concluded on this basis that the fishery is 'highly unlikely' to cause serious or irreversible harm. There are various sources of evidence to support this conclusion – for example, Collie et al., (2000) predict a recovery time of sand habitats from trawling and dredging of on average ~50 days; there are a wide range of such studies in the literature. SG100 is met. Ephemeral seed mussel beds are – ephemeral; being lost to predation or to winter storms within the first year. The beds tend to re-appear in the same area but not every year and with variable biomass from year to year. Fishing does not remove all the biomass from the beds. It is not known whether fishing speeds up or reduces the rate of overall loss of these seed beds; this probably varies in different cases. Overall, it is clear that since the habitat lasts for only a few weeks or months in any case, fishing cannot logically reduce structure and function to the point of serious or irreversible harm. SG100 is met. Impacts from seed collectors (UoA2): Seed collectors may have two impacts: i) bio-deposition on to the habitats below (sand or mud) and ii) creation of a novel habitat (hard substrate in the water column). The impact of seed mussel collectors on the seabed has been evaluated in the Netherlands where it was found that there was little difference between the areas inside and outside the seed collectors, except for an increase in the abundance of macrofauna (crabs, starfish and others) under the collectors associated with clumps of mussels which had fallen off. On this basis, serious or irreversible harm from bio-deposition is highly unlikely, with evidence, so SG100 is met. In relation to the creation of new hard substrate, recent species inventories from the Lower Saxony Wadden Sea (described in Gittenberger 2015) have showed that a large number of species, including non-native species not previously known from the area, are present in the small areas of hard substrate available around the Wadden Sea. These inventories focused particularly on harbours, floating pontoons and rocks put in place for coastal protection. The team considered that on this basis, the seed collectors are not creating a new habitat – such anthropogenic habitats are already widely distributed in the area. On this basis,

		SG80 is met. There is not 'evidence', however, as to the full range of species which might settle on seed collectors in this area (as yet), so SG100 is not met. Impacts on culture plots: The sediment substrate in mussel culture plots is known to be significantly altered when mussels are relaid, because of the generation of 'mussel mud' (organically-enriched fine mud from mussel faeces and pseudo-faeces). This creates a different habitat which supports a community of species typical of organically-enriched mud rather than sand. There is evidence from other areas where mussels are relaid on sandflats (e.g. the Menai Strait; Beadman et al. 2004) that the diversity of this community declines as mussel density (biomass per unit area) increases, because of the increasing tendency for the sediment to become anoxic. However, the impact on natural habitats is confined directly to the footprint of the mussel lays and there is no evidence of any effects propagating beyond the lays (Beadman et al., 2004). Given the life-history characteristics and low diversity of the natural community and the energetic nature of the environment, removal of the mussels most likely results in the restoration of a natural system relatively quickly (within weeks or months). On this basis, the team considered that the UoA is unlikely to cause serious or irreversible harm, and there is some evidence; SG100 is met.		
b	VME habitat status			
	Guidepost	The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N – UoA1 Y – UoA2

	Justification	Relevant VME habitats are 'biogenic reefs' (long-term persistent subtidal mussel beds; defined as those with >1 year class present). These may be impacted by fishing gear, but seed collectors and culture plots are not relevant here. Hence for UoA2, since there is no interaction with VMEs, SG100 is met by default. The rationale below applies to UoA1. The key question is the extent to which the subtidal seed beds on which the fishery operates might naturally persist to become permanent mussel beds ('biogenic reefs' in Natura 2000 parlance) and the extent to which fishing on these beds prevents that from happening. Mussel seed that settles in the spring-autumn period is usually found to be gone, either quite quickly (within a few weeks) or at least by the following spring (see 'stability map' made for the Lower Saxony Wadden Sea; van Stralen, 2015). For the SH Wadden Sea, Nehls et al. (2011) describe a sublittoral seed bed where settlement which occurred during 2003 was not fished and was all removed by starfish by the end of 2004; the same reportedly occurred in an abandoned culture plot. The overall conclusion of this monitoring report is that the development of stable subtidal mussel beds in the area is not very likely. This view of subtidal seed beds is largely accepted (by management authorities as well as fishers) in other, similar ecosystems with similar fisheries (e.g. Morecambe Bay, UK; Mandy Knott, Chief Scientist, NW IFCA, pers. comm.; see also PCR Menai mussels and PCR Exmouth mussels), although in some areas winter storms play at least as much of a role as starfish. The experience of the team from two broadly similar (although smaller) sites in the UK suggests that it is optimistic to suppose that subtidal mussel 'reefs' are often able to develop, even in the absence of fishing. Nevertheless, mapping carried out by the National Park authority since 2009 (Figure 8) suggests that some persistent mussel beds may be present. This mapping is carried out by side scan but also ground truthed via grab samples and in some cases towed video. At the site visit, the team did not find consensus among stakeholders (on the management side) as to whether these 'reefs' were in fact subtidal mussel beds or not, and a detailed description of mapping methods is not available to allow the team to make a judgement. The team has therefore proceeded with scoring on the assumption that such mussel beds may be present. The Dutch research project 'PRODUS' addressed the issue of fishery impact on subtidal mussel beds directly (Smaal et al., 2013; van Stralen et al., 2013; Craeymeersch et al., 2013; Drent and Dekker, 2013a and b; Jansen et al., 2013; Glorius et al., 2013; van Bemmelen et al., 2013). This research found no impact of the autumn fishery on subsequent biomass and persistence of mussel beds, nor of any fishing on spatfall, but a medium-term (up to 2 years) effect of the spring fishery on subtidal beds which had persisted through the winter.

		Under the National Park zoning and the Framework Agreement, the fishery only operates in certain parts of the subtidal, hence any seed beds which form in the other areas will be left unfished, and the competing hypotheses will therefore be able to be tested directly in the coming years. The Framework Agreement also has provision for the closures of any persistent mussel beds, even in fished areas (beds with >1 year class present). The location of such persistent mussel beds forms part of the ongoing appropriate assessment (as agreed in the Framework Agreement) and the Framework Agreement states that the outcome of this assessment will be translated into management. Specifically, unless major impacts on the feature from fishing can be ruled out, the fishery will be excluded from this area, and there is provision for compensation if required. Weighing up the balance of existing evidence, and considering in particular that the fishery may only operate in part of the total area, the team considered overall that the fishery is 'highly unlikely' to cause serious or irreversible harm to these habitats. SG80 is met. At worst, there may be a short-medium term impact (lasting up to ~2 years) on mussel biomass on some of the fished beds, particularly from the springtime fishery (as suggested by the results of PRODUS). Furthermore, the management system (Framework Agreement) allows for any damage to be evaluated and if necessary mitigated in the future by a change in management (exclusion from the area). For the moment, however, as noted above, the competing hypotheses have yet to be tested directly, so while the SG80 requirements are considered to be met, there is not sufficient direct evidence from the SH Wadden Sea for SG100 to be met.		
c	**Minor habitat status**			
	Guidepost			There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?			Y
	Justification	The fishery is limited in where it can operate at present (and will be further restricted under the Framework Agreement) and its overall footprint is small. The team did not identify any minor habitats – SG100 is met by default.		

References	H&S Consultancy, 2014; Beadman et al., 2004 ; van Stralen, 2015; Nehls et al., 2011; Collie et al. 2000; Gittenberger 2015; Smaal et al. (2013); van Stralen et al. (2013); Jansen et al. (2013); Glorius et al. (2013); Craeymeersch et al. (2013); van Bemmelen et al. (2013); Drent and Dekker et al. (2013a and b); MEP, 2012; MEP, 2016; Framework Agreement and associated map (Germany, 2015)
OVERALL PERFORMANCE INDICATOR SCORE:	**95 (UoA1 and 2)**
CONDITION NUMBER:	**N/A**

Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	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 all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Y	Y	Y
	Justification	The key measure to protect sensitive habitats is the zonation, as set out in the existing management arrangements and the Framework Agreement and associated map (Figure 3), which permits the fishery to operate only in certain areas, as agreed with the LLUR, National Park and other NGOs. This will protect some areas of naturally occurring seed beds, on the off-chance that they may be able to persist in the absence of fishing (although based on experience elsewhere the team did not consider this likely). The Framework Agreement also allows for other areas to be closed if damage from fishing cannot be ruled out – it is, however, not yet 'in place'. The team considered, however, that existing arrangement (National Park zonation, the strategy to phase out seed mussel fishing in favour of seed collectors), nevertheless constituted a 'strategy' for managing the impact of the UoA (and all mussel fisheries, since there are none outside the UoA) on habitats. SG100 is met.		
b	Management strategy evaluation			

	Guidepost	The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved.
	Met?	Y	Y	N
	Justification	In relation to the existing situation, there is an objective basis for confidence that the strategy will work, given that large areas are off-limits to the fishery. There is not, however, 'high confidence' because of limited information about the distribution and fate of subtidal mussel beds in the presence and absence of fishing. SG80 is met. The team had high confidence that the strategy would work once the Framework Agreement is in place, since subtidal seed beds in >50% of the area will be protected from fishing, and any 'biogenic reefs' found in the open areas will likewise be protected. In the long term, a move from seed dredging to seed collectors will ensure that all seed beds are left unfished (although the team was uncertain that this would make much difference to the final outcome). Testing (via an appropriate assessment) is underway but is not yet complete. SG100 will be met in the future but is not yet met.		
c	Management strategy implementation			
	Guidepost		There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully.	There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Y	N

	Justification	The strategy is enforced via 'black box' monitoring (see PI 3.2.3) which will clearly show whether or not it is being respected, which is available for inspection at the offices of the LLUR. The objective of the strategy is to protect a proportion of the area from fishing, so that biogenic reefs may form if conditions are right (to be tested). Most of the measures are already in place (e.g. zoning) but the Framework Agreement does not come officially into force until the end of 2016. On this basis, the team concluded that most but not all of the strategy is being implemented, although the team was confident that the Agreement would be fully implemented as required. Overall, the team concluded that SG80 is met but SG100 is not yet met, pending full implementation of the Framework Agreement and the results of the appropriate assessment.		
d	**Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs**			
	Guidepost	There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs.	There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Y	Y	Y
	Justification	Other MSC UoAs and non-MSC fisheries are not relevant here (see Section 4.1). As noted above, there is clear quantitative evidence of compliance, so SG100 is met.		
References		Framework Agreement and associated map (Germany, 2015)		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3		**Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guidepost	The types and distribution of the main habitats are **broadly understood**. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	Y	Y	N

	Justification	The main habitat types and their distribution (sand banks, mud flats, tidal channels) is known (although details may vary as sediment is transported). They are known not to be vulnerable to disturbance by fishing, since natural rates of disturbance are high. SG80 is met for 'main' habitats. In terms of vulnerable habitats (VMEs), as set out above, the fishery operates on subtidal seed mussel beds in some areas (following the Framework Agreement); it is not known for certain if the fishing activity changes the nature of these habitats (from persistent to transient) or not, but it is considered unlikely that persistent subtidal beds will form (Nehls et al. 2011; see discussion in 2.4.1 but see also Figure 8). Where and when these beds appear is variable over time, but they do tend to re-occur in certain known areas, albeit not every year. SG80 is met for these habitats. In relation to SG100, there remains uncertainty and disagreement between stakeholders as to the presence of 'biogenic reefs' in the subtidal. There has been some mapping with side-scan sonar plus groundtruthing, which has identified various reef areas; some stakeholders were highly sceptical of these results, but others were confident that such beds were present (see Figure 8). These areas are closed to fishing, and/or subject to evaluation under an appropriate assessment (ongoing). Overall, however, it is not the case that the distribution of these habitats is known with confidence over the entire subtidal Wadden Sea. SG 80 is met, but SG100 is not met.		
b	Information adequacy for assessment of impacts			
	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. OR **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:**	The physical impacts of the gear on all habitats have been quantified fully.

			Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	Y	Y	N
	Justification	The CSA was not used. Nearly all of the subtidal habitat aside from mussel beds (whether ephemeral or more persistent) is sand/mud. The mussel beds are mapped periodically (see e.g. Nehls et al. 2011 – this report is currently being produced again in a version up to date to 2015; Martin Ruth pers. comm.) There has been some more general subtidal mapping using sidescan sonar plus groundtruthing (see Figure 8), although the results are somewhat disputed in relation to 'biogenic reefs'. The LLUR has extensive underwater video footage in the area of the fishery; this has not up till now been incorporated into the overall mapping programme, however (Ruth, pers. comm. and obs.). The culture plots and seed collectors are in designated and known areas (see Figure 3). The footprint of the fishery can be tracked in detail and in real time as well as historically using the black box monitoring. There has also been research into the other habitat impacts of the fishery (seed collectors, culture plots) although mainly in other areas (see PI 2.4.1) On this basis, the team concluded that the information is sufficient to identify the impact of the fishery on main (and VME) habitats, and there is reliable information on the spatial extent of interaction between the fishery and habitats, and on the use of the fishing gear (as well as the location of the seed collectors and culture plots). SG80 is met. It is not, however the case that the physical effect of the gear (and the fishery more widely) on all habitats has been quantified (quantified in relation to what? quantified 'fully' is certainly impossible), although it has in some cases as described in PI 2.4.1. SG100 is not met in full.		
c	Monitoring			
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		Y	N

	Justification	For as long as the fishery is confined to limited areas, and tracked with black boxes, then any increase in risk will only come from an increase in the footprint of the fishery, which will be easily detectable. SG80 is met. In relation to SG100, the team noted that although stakeholders had a variety of opinions and assumptions regarding habitats and fishery impacts, there was a paucity of hard information about habitats in the subtidal. The key point of uncertainty relates to the question of whether unfished subtidal seed beds might be able to persist in some cases to form biogenic reefs. The closed areas agreed in the Framework Agreement provide an opportunity to test this and it is to be hoped that this opportunity will be taken to investigate and settle this question, which has not yet been done. SG100 is not met.
References		Framework Agreement (Germany, 2015); Nehls et al., 2011
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER:		**N/A**

Evaluation Table for PI 2.5.1 – Ecosystem outcome

PI 2.5.1		**The UoA 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	Ecosystem status			
	Guidepost	The UoA 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 UoA 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 UoA 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	UoA1 and UoA2: As noted in relation to Principle 1 (see Section 0), the impact of the fishery on the target stock is nil (or potentially positive). There are no primary species, impacts on secondary species are thought to be confined to changing local distributions rather than anything on a population level, impacts on ETP species are low and indirect (disturbance) rather than direct, and serious impacts on habitats (including from indirect effects such as bio-deposition from the spat collectors and on culture plots) are also highly unlikely. The effect of the fishery is essentially to move organisms (mussels and associated fauna) around within the ecosystem, on a local level, rather than to affect overall biomass and species composition in any significant way. Concerns have been raised in other mussel fisheries about the role of movements of mussels in bringing non-native species into the ecosystem – this question is dealt with in the MSC Standard for bivalve fisheries under the question of translocations. It has been concluded in this case that the localised movements of mussels from seed beds or seed collectors to culture plots with the SH Wadden Sea does not constitute translocation, so this question does not arise. A risk assessment for the movement of mussels within the Wadden Sea as a whole (Gittenberger, 2015) concluded that the risk was low even at this scale. Finally and more generally, the team noted i) that the ecosystem is naturally energetic, with large volumes of water exchange on each tide and high rates of sediment transport; and ii) that the footprint of the fishery (fishable seedbeds, culture plots and seed collectors) in relation to the ecosystem is small. On this basis, the team concluded that there are various lines of evidence that suggest that the fishery is highly unlikely to disrupt ecosystem structure and function. SG100 is met.		
References		Gittenberger, 2015		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		**There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	There are **measures** in place, if necessary which take into account the **potential impacts** of the fishery on key elements of the ecosystem.	There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place.
	Met?	Y	Y	Y
	Justification	There is a strategy that consists of a plan, in the form of the Wadden Sea Plan (2010). This includes fisheries as one of the activities, and mussel beds as one of the habitats, and sets outcome objectives for each habitat (‘a natural size, distribution and development of natural mussel beds’). To implement the plan, there are various measures in place, such as the Trilateral Monitoring and Assessment Programme (TMAP) to evaluate whether these goals are being achieved, of which regular monitoring of mussel beds, the mussel fishery and its management (Nehls et al. 2011) forms a part. Actions are put in place to address any concerns that arise in relation to the outcome of TMAP – the Framework Agreement would be an example for this fishery, although the National Park rules also go more widely. SG100 is met.		
b	Management strategy evaluation			

	Guidepost	The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
	Met?	Y	Y	Y
	Justification	Based on the evaluation made above, as well as the conclusion of monitoring (e.g. Nehls et al. 2011) there is high confidence that the fishery is having any significant impact on the ecosystem. Current measures restrain the fishery to a very limited footprint. SG100 is met.		
c	**Management strategy implementation**			
	Guidepost		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		Y	N
	Justification	As set out in 2.3.2 and 2.4.2, there is evidence that the strategy set out in the Framework Agreement is being broadly implemented already and will be implemented in full from the date it comes into force, so SG80 is met, but since has not yet come into force, SG100 is not met in full.		
References		Common Wadden Sea Secretariat, 2010; Framework Agreement and associated map (Germany, 2015; Figure 3); Nehls et al., 2011		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3		**There is adequate knowledge of the impacts of the UoA on the ecosystem.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guidepost	Information is adequate to **identify** the key elements of the ecosystem.	Information is adequate to **broadly understand** the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	The key elements of the ecosystem are set out in the Wadden Sea Plan and monitored via the TMAP. SG80 is met.		
b	Investigation of UoA impacts			
	Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and **have been investigated in detail**.
	Met?	Y	Y	N
	Justification	Sufficient information is available, as set out in the rest of P2, to be confident that the fishery is having very low impacts on the key elements of the ecosystem. The main issue of concern is around potential impacts on stable subtidal mussel beds. This is investigated to some extent (e.g. in Nehls et al. 2011) but consensus has not been reached between stakeholders – hopefully the implementation of the Framework Agreement will allow this issue to be investigated conclusively. SG80 is met but SG100 is not met.		

c	Understanding of component functions			
	Guidepost		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**.
	Met?		Y	Y

	Justification	P1 target species: The role of mussels in ecosystems (filtering species, bentho-pelagic coupling, prey, structured habitat) is well-understood (e.g. see review in Seed et al., 2000) and the impact of the fishery on mussels in this ecosystem is understood (see Section 0; blackbox monitoring; Nehls et al. 2011 etc.). Primary spp.: None Secondary spp.: The role of starfish and green crabs in ecosystems (opportunistic predators and scavengers, prey) is likewise well-understood (e.g. see Saier 2001, Grosholz and Ruiz 1996). ETP spp.: The biology and ecology of eider ducks is well-understood (summarised in Birdlife International 2015) and the role of migratory birds in general in the Wadden Sea ecosystem has been studied, particularly in relation to their consumption of shellfish (e.g. Kraan et al. 2009, Schieffaert and Nehls 1997). The main role of seals and porpoise in the Wadden Sea ecosystem is likely to be via consumption of fish: the role of seals in various ecosystems have been extensively studied, mainly via concern about competition with fishermen or impact on the recovery of fish stocks (e.g. Spitz et al. 2015); the diet of harbour porpoise is likewise well-known (Santos and Pierce 2003). Habitats: The types of habitat present in the Wadden Sea is known (see 2.4.1) and their role in the ecosystem (e.g. in relation to mussel beds) is also known (see under P1 target species above). One of the assessments of the Dutch mussel fishery raised the question of the carrying capacity of the ecosystem for suspension feeders (see Table 5). Some research was subsequently done in the Oosterschelde, which is the hub of the NW European mussel industry and contains SMAs as well as suspended and bottom culture and rewatering plots; the Oosterschelde is also in general a less productive ecosystem than the Wadden Sea (for which reason the Dutch mussel growers move mussels into the Wadden Sea for a period of growth and then back to the Oosterschelde). There was no evidence that carrying capacity is being reached in this ecosystem, which is less productive and more heavily used, hence it is reasonable to infer that it is not likely to be an issue in the SH Wadden Sea (Smaal, 2015). Overall, on this basis, the main functions of the various components is known, and SG80 is met. In relation to SG100, the team considered that the main functions of all these components in the Wadden Sea ecosystem specifically have either been investigated (e.g. in relation to mussel beds, migratory birds as above) or can be inferred with reasonable confidence from existing information. SG100 is also met.
d	Information relevance	

	Guidepost		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	N
	Justification	As set out in Section 0, 2.2.1, 2.3.1 and 2.4.1 there is adequate information available on the impacts of the fishery on the various ecosystem components, which allows the consequences of the fishery for the ecosystem (minimal – see 2.5.1) to be inferred with confidence. SG80 is met. In relation to SG100, the team noted the ongoing question around whether the fishery might disrupt the formation of persistent subtidal mussel beds in areas where they fish on seed beds. All the available evidence suggests that this is not likely (see PI 2.4.1 for an analysis) but it remains a possibility. With the implementation of the Framework Agreement, it will be possible to test this hypothesis directly, and it is to be hoped that this will be done, so that conflict between the fishery and stakeholders does not continue based on inferences and assumptions. SG100 is not fully met.		
e	Monitoring			
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y

	Justification	A strategy is in place (the Wadden Sea Plan and the Framework Agreement). The footprint of the fishery is closely monitored (blackbox). Concerns were raised (e.g. in the Netherlands bottom culture MSC assessment) about increases in risk due to the expansion of SMAs; however, as noted above, a carrying capacity study has been carried out (Smaal, 2015) in the Oosterschelde – a lower productivity environment than the Wadden Sea, which suggests that carrying capacity is not a limiting factor for the expansion of SMAs. Sufficient information is available to ensure that ecosystem impacts of the fishery remain minimal. SG100 is met.
References		Seed et al. 2000 ; Nehls et al. 2011 ; Saier 2001; Grosholz and Ruiz 1996 ; Birdlife International 2015; Kraan et al. 2009; Schieffarth and Nehls 1997; Spitz et al. 2015; Santos and Pierce 2003; Smaal, 2015.
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER:		**N/A**

Evaluation Table for PI 3.1.1 – Legal and/or customary framework for UoA1 and UoA2

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainability in the UoA(s); 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	Compatibility of laws or standards with effective management			
	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	Generally fisheries in the EU are managed through the CFP. The CFP "*should ensure that fishing and aquaculture activities contribute to long-term environmental, economic, and social sustainability.*" It states also that "*access to a fishery should be based on transparent and objective criteria including those of an environmental, social and economic nature. Member States should promote responsible fishing by providing incentives to those operators who fish in the least environmentally damaging way and who provide the greatest benefits for society.*" (basic fisheries regulation 1380/2013). Germany has ratified the United Nations Convention on the Law of the Sea of 10 December 1982 (UN 1982) which set out the principle that all States have a duty to adopt appropriate measures to ensure sustainable management of marine resources and		

		to cooperate with each other to this end. The management system follows the principles set out in the FAO Code of Conduct for Responsible Fisheries (FAO 1995a), which includes the application of a precautionary approach. It also complies with the requirements in the UN Fish Stocks Agreement (FAO 1995b) regarding reference points and application of the precautionary approach as well as the Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas (FAO, 1993). And finally Germany has signed the UN Convention on Biological Diversity (UN, 1992). Environmental issues are addressed by several EU Directives such as the Habitats Directive (EC, 1992), the Birds Directive (EC, 2009), the Water Framework Directive (EC, 2000), the Shellfish Directive (EC, 2006) and the marine Strategy framework Directive (EC, 2008). This fishery takes place within German territorial waters. That's why also German legislation such as the Sea Fisheries Law (Germany, 1984), the Sea Fisheries Regulation (Germany, 1989), the Federal Waterway Act (Germany, 1968) and the Federal Nature Conservation Law (Germany, 2009) as well as Schleswig-Holstein legislation such as the Schleswig-Holstein Fisheries Law (Germany, 1996), the State Regulation on the Exercise of Fisheries in Coastal Waters (Germany, 2008), the State Nature Conservation Law (Germany, 2010) and the State Law on the Conservation of the Wadden Sea (Germany, 1999) have to be applied. The Mussel Programme Schleswig-Holstein Wadden Sea of the Ministry of Agriculture, Environment and Rural Areas defines in detail roles and responsibilities of involved organisations and individuals. The international and national legal systems are consistent with MSC Principles1 and 2. Therefore SG 100 is met.		
b	Resolution of disputes			
	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 UoA.	The management system incorporates or is 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
	Justification	There are well-established and transparent mechanisms in place for resolving legal disputes. Representatives of the Fisheries, the Environmental and the Nature Park Administration, fishermen and NGOs exchange ideas and discuss potential problems such as management decisions. In case a consensus cannot be reached there is always the possibility to file a lawsuit. SG100 is met.		
c	Respect for rights			
	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	Y
	Justification	The German fisheries legislation implements European laws. The CFP states that “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 the relative stability of fishing activities by allocating fishing opportunities among Member States, based on a predictable share of the stocks for each Member State” (EC, 2013). On the other hand the only fishery in the area that could be impacted by the mussel fishery is the shrimp fishery but there is generally no conflict. No one else depends on the fishery for food or livelihood. Hence SG100 is met.		
References		EC, 1992; EC, 2000; EC, 2002; EC, 2007; EC, 2008, EC, 2009a; EC, 2009b; EC, 2012; EC, 2013; FAO, 1993; FAO, 1995a, FAO, 1995b; Germany, 1984; Germany, 1989; Germany, 1996; Germany, 1999; Germany, 2008; Germany, 2009; Germany, 2010; National Park website; UN, 1982; UN, 1992		

OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER:	**N/A**

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities for UoA1 and UoA

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	Roles and responsibilities			
	Guidepost	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.
	Met?	Y	Y	Y

	Justification	The management system for the fishery involves scientists, government, fisheries managers and stakeholders in a consultative process. The roles of all parties in all areas of responsibility are defined in the valid legislation, particularly in the State Fisheries Law and the Nature Park Law. In addition, in 2006 the State Ministry of Agriculture, Environment and Rural Areas adopted the Mussel Programme Schleswig-Holstein Wadden Sea where the roles and responsibilities of all concerned are described in detail and 2011 the State Government has signed a contract under public law with the PO and the fishing companies where the framework for the management is defined. SG 100 is therefore met.		
b	Consultation processes			
	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
	Justification	There exists a consultation process engaging fisheries and environmental administrations, fishermen and NGOs. Relevant information is regularly collected personally and through the Blackbox system. Licences for seed fishery and culture plots are allocated for several years. The cooperation between all parties has lately been strengthened by the signature of a framework agreement between the State Government, the PO “Schleswig-Holstein Mussel Fishermen” and 5 NGOs where further reductions of fishing possibilities have been agreed and offering long term stability for the fishermen. There is, however, no roundtable where management decisions are presented and all stakeholders can participate in the discussion. The Fisheries Administration takes the decision on the basis of scientific advice and national and state legislation. Explanations on whether and how information has been used to reach a decision are not disseminated. Hence SG80 is met but SG100 is not met.		
c	Participation			

	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	The exchange between the stakeholders, particularly between the Fisheries Administration and the PO seems to be on a high level. Opportunities exist for all interested parties to be involved in consultation processes. But the final decision is taken in the Ministry and not in a democratic vote. Participation is encouraged but definitely not facilitated. SG80 is met but SG100 is not met.		
References		Germany, 1996; Germany, 1999; Germany, 2006; Germany, 2008; Germany, 2011; Germany, 2015; National Park website		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 3.1.3 – Long term objectives for UoA1 and UoA2

PI 3.1.3		**The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are **implicit** within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are **explicit** within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are **explicit** within **and required by** management policy.
	Met?	Y	Y	Y
	Justification	The EU CFP clearly provides for long term objectives, and that applies also for the German and Schleswig-Holstein legislation, particularly for the Mussel Programme ("*The declared goal of the government is that the mussel resource is used sustainably and nature-friendly*"), the contract between State and PO ("… *to ensure the sustainable use of the mussel resources and the preservation of a preferably nature-friendly mussel fishery in the National Park 'Schleswig-Holstein Wattenmeer' in agreement with the supreme Nature Conservation Authority …*") and the recently agreed Framework Agreement ("*… pursue the objective to allow for a nature-friendly mussel culture industry in conformity with the National Park compliant and economically viable that meets the requirements of European and national fisheries and nature conservation legislation")*. The management system acts accordingly, the licenses for the seed mussel fishery and for the culture plots are allocated for several years, the number of licences is limited to eight, importation of seed mussels is banned. SG100 is met.		
References		CWSS, 2010; Germany, 2006; Germany, 2001; Germany, 2015; National Park website		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.
CONDITION NUMBER:	N/A

Evaluation Table for PI 3.2.1 Fishery-specific objectives for UoA1 and UoA2

PI 3.2.1		**The fishery-specific management system 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	Objectives			
	Guidepost	**Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific 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-specific 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-specific management system.
	Met?	Y	Y	Y
	Justification	The Federal as well as the State fishery legislation including the Mussel Programme aim clearly at a sustainable exploitation of the mussel stock and at a minimisation of the environmental impact. Standards set by the EU Habitat (EC, 1992), Birds (EC, 2009b), and Shellfish (EC, 2006) Directives are respected. In the Mussel Programme, the contract between State and PO and the Framework Agreement declare more or less unanimously the common objective is to ensure the sustainable and nature-friendly use of the mussel resources the meets the requirements of European and national legislation. The Wadden Sea Plan 2010 "*provides a framework for the integrated management of the Wadden Sea Area as an ecological entity, as well as its landscape and cultural heritage, within the cultural entities.*" The measures taken, such as the limitation of the number of fishing licences, the allocation of licences for several years, the restriction of the fishery to the subtidal zone, the reduction of the size of culture plots from 2,400 to 1,700 ha since 1999, the ban of seed imports are consistent with achieving the outcomes expressed by Principles 1 and 2, SG100 is met.		

References	CWSS, 2010; EC, 1992; EC, 2002; EC, 2006; EC, 2007; EC, 2009b; EC, 2012; EC, 2013; Germany, 1984; Germany, 1989; Germany, 1996; Germany, 1999; Germany, 2008; Germany, 2009; Germany, 2010; National Park website
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER:	**N/A**

Evaluation Table for PI 3.2.2 – Decision-making processes for UoA1 and UoA2

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.**		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	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	The decision-making process is well established. Based on scientific advice and in close exchange with the mussel fishery, the Nature Park Authority and the NGOs decisions are taken by the competent Ministry. All measures and strategies clearly aim at the long-term objectives fixed in the European and national legislation. SG80 is met.		
b	Responsiveness of decision-making processes			
	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

	Justification	The decision-making process can react in a timely manner on serious and other important issues. The relevant legislation (Mussel Programme, Framework Agreement, Nature Park Law) provide for longtime measures restricting the fishery (closed season, size of culture plots, minimum residence period on culture plots, etc.). The fishery can be restricted immediately if for instance large reefs (> 100 ha) in the subtidal zone are discovered. But there is still a lack of information especially in the subtidal areas. Therefore it can't be assumed that the process responds to all issues. SG100 is not met.		
c	Use of precautionary approach			
	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	The decision-process is based on the best information available supplied by the very efficient Blackbox system and the regular mussel monitoring. The lately signed Framework Agreement where i.e. the total culture plot area has been reduced beyond the requirements of the Mussel Programme clearly indicates that the precautionary approach is the basis for all decisions. SG80 is met.		
d	Accountability and transparency of management system and decision-making process			
	Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	**Information on the fishery's 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 the fishery's 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	Decisions taken with regard to licenses for the seed mussel fishery or the allocation of culture plots is made available to the PO and the concerned fishermen. These decisions are, however, not publicly announced. Monitoring results are available in the competent Ministry on request and are partly published in annual reports. The PO and other stakeholders are informed on the outcome. There is, however, no formal reporting to all stakeholders. SG 80 is met but SG100 is not met.		
e	Approach to disputes			
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	Y
	Justification	The management system or fishery acts proactively to avoid disputes. The best example for this is the lately signed Framework Agreement between the Ministry, the PO and 5 NGOs. This agreement has ended a long lasting conflict between the undersigned concerning the impact of the mussel fishery on the National Park's eco-system. SG100 is met.		
References		Germany, 1999; Germany, 2006; Germany, 2011; Germany, 2015; National Park website		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER:				**N/A**

Evaluation Table for PI 3.2.3 – Compliance and enforcement for UoA1 and UoA2

PI 3.2.3		**Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.**		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guidepost	Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance **system** has been implemented in the fishery 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 and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
	Justification	In addition to the well-established usual control mechanisms like the logbook and the VMS-system, the Schleswig-Holstein mussel fishery is equipped with a highly effective blackbox system. The data are transferred to the competent Ministry and to the National Park Administration. This system does not only record the vessels while they are fishing/moving but also if they are working stationary (if a hydraulic pump or a winch is working the black box is activated). This allows to regulators to establish an high-resolution picture of the vessels' activities that is used for the enforcement of management measures. SG100 is met.		
b	Sanctions			
	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	Sanctions to deal with non-compliance exist in the Schleswig-Holstein Fisheries Law and the State Regulation on the Exercise of the Fishery in Coastal Waters and will be applied consistently. Since so far no major infringement has been reported the system could not demonstrate its dissuasive effect. Hence SG80 is met but SG100 is not met.		
c	Compliance			
	Guidepost	Fishers are **generally thought** to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	**Some evidence exists** to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a **high degree of confidence** that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	Y
	Justification	There is a high degree of confidence that fishermen comply with the management system. No offences have been reported for several years. As indicated in the Mussel Monitoring and Mussel Management Report, also in former years only minor deficits such as missing identification of culture plots and seed collectors could be easily corrected without sanctions. SG100 is met		
d	Systematic non-compliance			
	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	There is no evidence of systematic non-compliance, no violations have been reported for several years. SG80 is met.		
References		BioConsult SH, 2011; Germany, 1996; Germany, 2008		

OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER:	**N/A**

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation for UoA1 and UoA2

PI 3.2.4		**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	Evaluation coverage			
	Guidepost	There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **key** parts of the fishery-specific management system	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.
	Met?	Y	Y	N
	Justification	The Management Plan (Mussel Programme, Contract between State and fishery, Framework Agreement) is reviewed by the concerned parties and the interested NGOs. The Plan has fixed terms (currently 5 years, 15 years in the subsequent period) and is evaluated at the end of each term. In the Framework Agreement the basis for the next Mussel Programme provision is made for an annual meeting of the parties to discuss the success or any problems in the implementation. And last but not least the NGOs will keep an critical eye on the mussel fishery and indicate the identified problems. There is however no mechanism in place to evaluate all parts of the system. SG100 is not met.		
b	Internal and/or external review			

	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
	Justification	The Contract between the State of Schleswig-Holstein, the mussel fishermen and the PO fixing the management rules has a term of 5 years and will be reviewed and renegotiated before signed for a subsequent period. The Management system is subject to an ongoing external scrutiny by NGOs engaged in the protection of the Wadden sea. This can't however be considered to be a regular external review. Hence SG80 is met but SG100 is not met.		
References		Germany, 2006; Germany, 2011; Germany, 2015		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER:				**N/A**

Appendix 1.2 Risk Based Framework (RBF) Outputs

Appendix 1.2.1 Productivity-Suspectibility Analysis (PSA)

Only main species scored?	No						Productivity Scores [1-3]									Susceptibility Scores [1-3]					
Scoring element	First of each scoring element	Family name	Scientific name	Common name	Species type	Fishery descriptor	Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level	Density Dependence	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score
1	First	Asteriidae	*Asterias rub*	Common sta	Invertebrate	Mussel Dredge	1	2	1			1	2	2	1.5	3	3	2	2	1.88	2.4
2	First	Portunidae	*Carcinus ma*	Green shore	Invertebrate	Mussel Dredge	1	1	1			1	3	2	1.5	1	3	2	2	1.28	1.9

Cumulative only								
	Catch (tons)	Weighting	Weighted Total	Weighted PSA Score	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost	
4					88	Low	≥80	
7					96	Low	≥80	
						MSC score		95
						Status		Unconditional Pass

Table 1.2.2.a. PSA Rationale Tables

PI number	2.2.1 – Secondary species outcome	
A. Productivity		
Scoring element (species)	Starfish (*Asterias rubens*)	
Attribute	**Rationale**	**Score**
Average age at maturity.	2 years (Fish and Fish, 1996)	**1**
Average maximum age	7-8 years (Schäfer, 1972)	**2**
Fecundity	~2.5 million eggs (Fish and Fish, 1996)	**1**
Reproductive strategy	Broadcast spawner (Caldwell et al. 2002)	**1**
Trophic level	3.1 (Jaschinski et al. 2008)	**2**
Density dependence	The species is known to have highly variable dynamics, with rapid outbreaks from low to high density (Vevers, 1949), suggesting that depensatory dynamics are unlikely. In relation to compensatory dynamics, there is no evidence either way, as far as the team could find out.	**2**
B. Susceptibility		
Attribute	**Rationale**	**Score**
Areal Overlap	The distribution of this species is very large (NE Atlantic from Norway to Senegal, except the Mediterranean). The stock structure within this distribution is not known. Areal overlap was therefore scored by stakeholder discussion (see Appendix 3). Stakeholders concluded that there may be >30% overlap, because starfish are attracted to subtidal areas with high densities of mussels, whether natural seed beds or culture plots.	**3**
Encounterability	Since the species is confined to the seabed, as is the gear, then encounterability automatically scores 'high risk'.	**3**
Selectivity of gear type	The gear is designed to harvest mussels, including small (seed) mussels, but does not have a mesh-size smaller than	**2**

	an individual seed mussels, since the animals are attached together by byssus (Figure 5). Stakeholders concluded (with low confidence) that 'immature individuals less than half the size at maturity can escape', giving a score of 'medium risk'.	
Post capture mortality	As described in the rationale for PI 2.2.2, some effort is made to remove and discard starfish post-capture, whether from seed harvesting or culture plot harvesting. These starfish are put back in the intertidal, where it is thought by stakeholders that some will survive, but some may die due to handling stress.	**2**

PI number	**2.2.1 – Secondary species outcome**	
A. Productivity		
Scoring element (species)	Green shore crab (*Carcinus maenas*)	
Attribute	**Rationale**	**Score**
Average age at maturity.	1-2 years (Fish and Fish, 1996)	**1**
Average maximum age	6-10 years (Klassen and Locke, 2007)	**1**
Fecundity	~370,000 eggs per year (Cohen and Carlton, 1995)	**1**
Reproductive strategy	Broadcast spawner (Fish and Fish, 1996)	**1**
Trophic level	3.5 (Jaschinski et al. 2008)	**3**
Density dependence	The species is known to be an invasive, taking advantage of all available prey sources and planktonic larval stages (Thresher et al 2003), suggesting that depensatory dynamics are unlikely. In relation to compensatory dynamics, there is no evidence either way, as far as the team could find out.	**2**
B. Susceptibility		
Attribute	**Rationale**	**Score**
Areal Overlap	The distribution of this species is very large (Norway to Mauritania (Roman and Palumb, 2004). The stock structure	**1**

	within this distribution is thought to be known, with a clear genetic breaks between the Atlantic and Mediterranean populations and populations in the Faeroe Islands and Iceland compared to the rest of the continent (Roman and Palumb, 2004). Areal overlap was therefore scored by stakeholder discussion (see Appendix 3). Stakeholders concluded that there may be <10% overlap, due to extensive native distribution.	
Encounterability	Since the species is confined to the seabed, as is the gear, then encounterability automatically scores 'high risk'.	**3**
Selectivity of gear type	Same rationale as for *Asterias rubens*, the gear is designed to harvest mussels, including small (seed) mussels, but does not have a mesh-size smaller than an individual seed mussels, since the animals are attached together by byssus (Figure 5). Stakeholders concluded (with low confidence) that 'immature individuals less than half the size at maturity can escape', giving a score of 'medium risk'.	**2**
Post capture mortality	As described in the rationale for PI 2.2.2, crabs are not specifically removed from seed mussels and directly re-laid (i.e. no removal from the ecosystem). Upon harvest crabs are removed through washing/sorting procedure and returned back to the water. Stakeholders thought that some crabs would survive this, but some may die due to handling stress.	**2**

Appendix 2 Peer Review Reports

Appendix 2.1 Peer Reviewer 1

Summary of Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**CAB Response**
Justification: Relatively minor comments have been provided against a number of PIs, and only the comment against 2.2.2 (review of alternative measures with respect to unwanted catch) has the potential to affect the conclusion in a significant way (i.e., possibly through the inclusion of a condition). In other regards, the report is well written and well justified.		*See response to detailed comments below*

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]	**N/A**	**CAB Response**
Justification: No conditions raised.		

If included:

Do you think the client action plan is sufficient to close the conditions raised? [Reference FCR 7.11.2-7.11.3 and sub-clauses]	**N/A**	**CAB Response**
Justification: No conditions raised.		

Performance Indicator Review

Please complete the appropriate table(s) in relation to the CAB's Peer Review Draft Report:

- For reports using one of the default assessment trees (general, salmon or enhanced bivalves), please enter the details on the assessment outcome using Table 12.
- For reports using the Risk-Based Framework please enter the details on the assessment outcome at

Table 13.

- For reports assessing enhanced fisheries please enter the further details required at Table 14.

Table 12 For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Y	Y	N/A	Not scored as enhanced C&G with no impact on wild stock	
1.1.2	Y	Y	N/A	Not scored as enhanced C&G with no impact on wild stock	
1.2.1	Y	Y	N/A	Not scored as enhanced C&G with no impact on wild stock	
1.2.2	Y	Y	N/A	Not scored as enhanced C&G with no impact on wild stock	
1.2.3	Y	Y	N/A	Not scored as enhanced C&G with no impact on wild stock	
1.2.4	Y	Y	N/A	Not scored as enhanced C&G with no impact on wild stock	

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.1	Y	Y	N/A	Scored 100 by default	
2.1.2	Y	Y	N/A	Scored 100 by default	
2.1.3	Y	Y	N/A	Scored 100 by default	
2.2.1	Y	Y	N/A	No further comment	
2.2.2	N	N	No condition set (but possibly should be)	Part of the text from GSA3.1.6 is provided (*Unwanted catches of species may also be designated as catch that is prohibited in that fishery. Unwanted catch may also include the part of the catch that has been thrown away or slipped where the components of that catch may not survive after release*), and the report then states that the catch of starfish and green crabs does not meet the MSC definition of 'unwanted' because "*The catch of starfish and green crabs is unwanted. It is not, however, prohibited, and is replaced in*	The full MSC guidance is given below (CAB notes in red) GSA3.1.6 Unwanted catch ▲ Where a UoA has a management plan, some species and sizes may be considered and designated to be 'unwanted catch' (including through using terms such as 'non-target', 'bycatch' or 'discards' in the plan). If not designated, unwanted catch of species are those that are not covered under the plan. Not applicable here – no management plan

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				the sea with, presumably, high survival (although probably not 100%)". The MSC guidance on unwanted catch is not, in the opinion of this peer reviewer, very clear. However, the 'prohibited' reference in the report seems somewhat erroneous because it is only one of several reasons to call a species 'unwanted' and, as well as the text above, GSA 3.1.6 states: "*If not designated, unwanted catch of species are those that are not covered under the plan*". GSA 3.5.3 also states that assessment teams only have discretion to not score SIe in the event that the catch of unwanted species is negligible. As the catch of green crabs and starfish is not negligible, they are not covered under a plan, and there is not evidence that they survive after release, SIe should be scored.	Unwanted catches of species may also be designated as catch that is prohibited in that fishery. This is not the case here; it is not prohibited to take crabs and starfish. Unwanted catch may also include the part of the catch that has been thrown away or slipped where the components of that catch may not survive after release. This is not the case here: post-capture survival is likely to be high. In other words, this situation meets none of the cases given in the guidance.

					GSA 3.5.3 … When determining what is 'negligible' the MSC does not specify a set cut-off; the team may consider the significance of the catch in relation to things like the proportion of the unwanted catch as part of the total catch or as part of the total amount of unwanted catch, as well as the regularity of the catch occurring when deciding whether it is negligible. In other words, MSC does not specify a particular method or cut-off point for defining 'negligible' although they note (GSA 3.5.3) that the decision should be in accordance with the precautionary approach. In this context, the team concluded that what is relevant here is the catch (or rather, the mortality) in relation to the populations of these species. It is clear that the impact of the fishery on green crabs and common starfish from unwanted catch is absolutely negligible – and is most likely more than offset by the fact that the fishery provides additional sources of food for these species (the culture plots). On this basis, the team also concluded that it is reasonable and precautionary to consider that these catches are 'negligible'. In conclusion, the team considered: 1. It is reasonable to describe these catches as negligible, certainly in terms of their impact on the stocks in question; 2. The situation meets none of the options set out in the guidance;
					3. Although 100% survival cannot be guaranteed (hence the comment in the text) high post-release survival is likely.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
					Overall, the team concluded that original decision not to score this scoring issue was appropriate.
2.2.3	Y	Y	N/A	No further comment	*N/A*
2.3.1	N	Y	N/A	The report mentions only common seals, but the Trilateral Seal Agreement (TSA) also covers grey seals. A brief review of http://www.waddensea-secretariat.org/management/seal-management indicates that the TSA is derived from the CMS, which suggests that grey seals do need to be considered as an ETP species (FCR SA3.1.5.2).Their inclusion should not change the scoring. Note that harbour porpoise are protected under ASCOBANS, as well as the Schleswig-Holstein law.	According to Brasseur et al. 2015. Recent (2014-15) surveys found that most of the grey seals in the Wadden Sea are in the Netherlands with relatively few using Schleswig-Holstein waters (see figure pasted at the end of this document). For this reason, and since interactions with the fishery by seals in general are very limited, they were not included. Nevertheless, for completeness they have been added. The score, as predicted, was not changed. As for the harbour porpoises - noted. Brasseur Sophie, Richard Czeck, Anders Galatius, Lasse Fast Jensen, Armin Jeß, Peter

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
					Körber, Ursula Siebert, Jonas Teilmann, Sascha Klöpper 2015. Grey seal surveys in the Wadden Sea and Helgoland in 2014-15. See http://www.waddensea-secretariat.org/sites/default/files/downloads/tmap/MarineMammals/GreySeals/grey_seal_report_2015.pdf
2.3.2	Y	Y	N/A	No further comment	
2.3.3	Y	Y	N/A	No further comment	
2.4.1	Y	Y	N/A	No further comment	
2.4.2	Y	N	N/A	As indicated in the text, SId is not relevant in the case of this fishery. As such, and given SA3.14.3, it should not be scored here. This impacts the scoring, reducing it from	The team disagrees. This scoring issue is not scored only in the case where there is no impact on a VME (i.e., either by the UoA, another MSC UoA, or a non-MSC fishery, where relevant – see SA3.14.3.2 and the associated guidance)

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				90 (2 x 100 and 2 x 80) to 85 (1 x 100 and 2 x 80).	(see GSA3.14.3). The VMEs identified in this fishery are permanent subtidal mussel beds ('biogenic reefs') which may be impacted by the dredging gear and so this scoring issue needs scoring. Note however that the second part of SG80 and SG100 which refers to other MSC UoAs/non-MSC fisheries is indeed not relevant. The scoring was not changed.
2.4.3	Y	Y	N/A	No further comment	
2.5.1	Y (probably)	Y (generally)	N/A	The text gives a general rationale describing why the fishery is unlikely to impact the ecosystem. However, the guideposts refer specifically to the key ecosystem elements, and these have not been identified acording to the guidance in SA3.16.1 and (particularly) SA3.16.3..	SA3.16.1. The team shall score the other components of the assessment (i.e., P1 target species, primary species, secondary species, ETP species and habitats) separately to this PI, which considers the wider ecosystem structure and function. SA3.16.3. The team should note that "key" ecosystem elements are the features of an ecosystem considered as being most crucial to giving

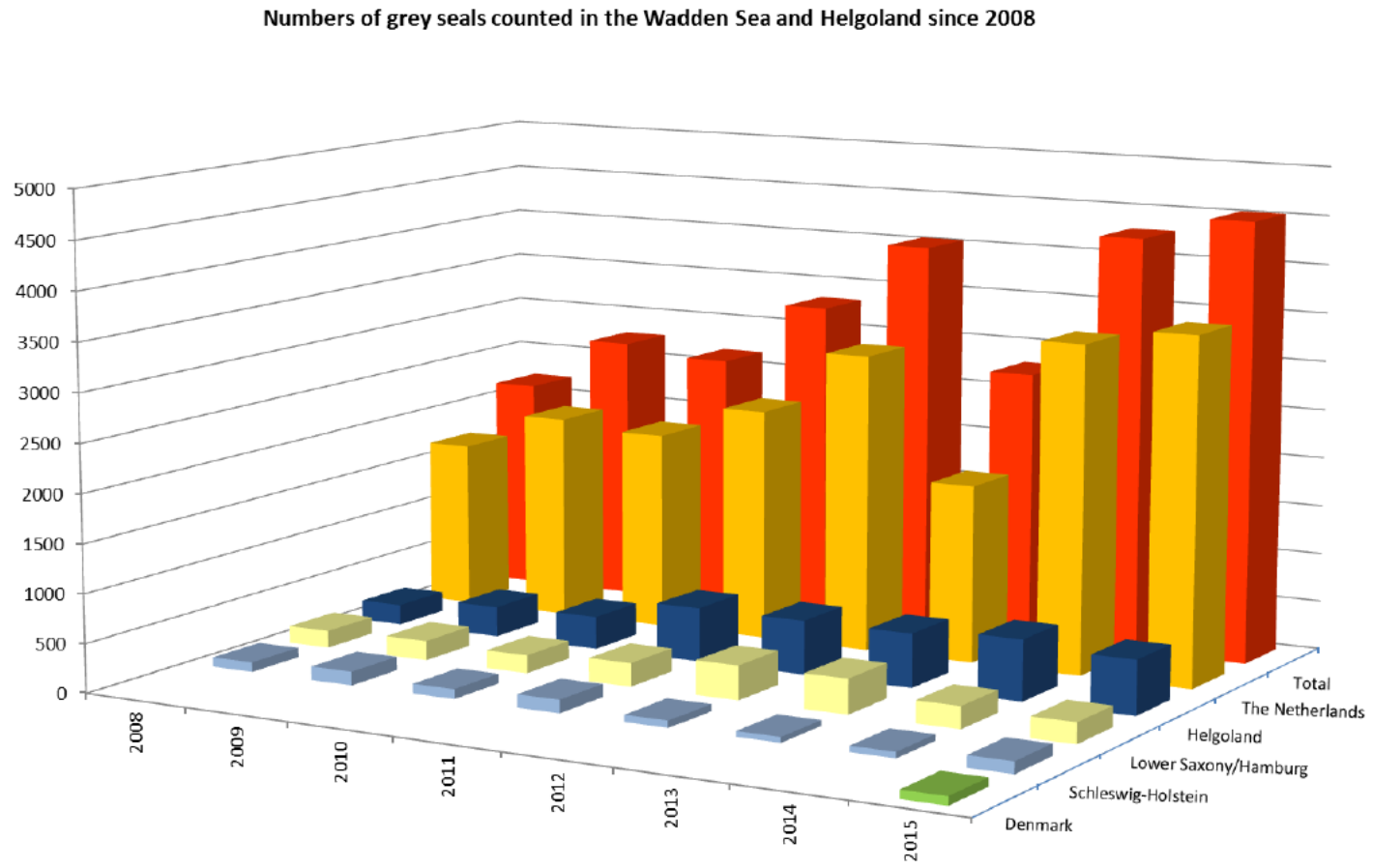
Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
					the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the UoA. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity. Although 'key ecosystem elements' are not identified specifically in the rationale (and the paragraphs cited by the reviewer do not specifically require this), it is clear from the report that the ecosystem is largely driven by physical factors – i.e. high energy tidal currents and sediment transport. The rationale makes it clear that the fishery has no impact on these processes, but also enters into a little more detail on components of the ecosystem which, while they are not key drivers of ecosystem structure or function, are of importance, not least to stakeholders.
2.5.2	Y	Y	N/A	No further comments.	

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.5.3	Y (probably)	Y (generally)	N/A	Noting the comment in 2.5.1, the text for this PI may need to be modified slightly to focus on key ecosystem elements. It is unlikely that this would require a change in score.	See response to comment for 2.5.1.
3.1.1	Y	Y	N/A	No further comments.	
3.1.2	Y	Y	N/A	No further comments.	
3.1.3	Y	Y	N/A	No further comments.	
3.2.1	Y	Y	N/A	No further comments.	
3.2.2	Y	Y (generally)	N/A	The text for SId states: "*Decisions taken with regard to licenses for the seed mussel fishery or the allocation of culture plots is made available to the PO and the concerned*	The methodology used to allocate licences is available, and the list of licensees is available – the team considered that this was sufficient.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				fishermen. These decisions are, however, not publicly announced" As the SG80 requires that information on management action is available on request, it would be useful to indicate if information on these decisions is available upon request in order to fully justify the 80 score.	
3.2.3	Y	Y	N/A	No further comments.	
3.2.4	Y	Y	N/A	No further comments.	

Table 13 For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process(es) applied to determine risk using the RBF has led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response:
1.1.1	N/A			
2.1.1	N/A			
2.2.1	Yes	Yes	No further comments.	
2.3.1	N/A			
2.4.1	N/A			
2.5.1	N/A			



See response to review of 2.3.1 for details.

Table 14 For reports assessing enhanced fisheries:

Does the report clearly evaluate any additional impacts that might arise from enhancement activities? Note: Justification to support your answers is only required where answers given are 'No'.	**Yes/No** Yes	**CAB Response:**
Justification: No further comments		*N/A*

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages

- It is noted that Table 6 in the report (Scoring elements) details only the target, primary, secondary and ETP species. The Full Assessment Reporting Template for enhanced fisheries requires under Section 4.1.3 (2) that: "*The report shall include (using Table 3 below): a) The set of scoring elements (e.g. species or habitats) that have been considered in each outcome PI in Principles 1 and 2.*" The habitats (PI 2.4.x) and key ecosystem elements (PI 2.5.x) should therefore also be included, here.

Added for 2.4 – for 2.5 it is really too nebulous.

Appendix 2.2 Peer Reviewer 2

Summary of Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes/No**	**CAB Response**
Justification: The assessment team did a good job in compiling all relevant and necessary information. I scored some performance indicators slightly lower, and one indicator slightly higher, but the SG 80 guideposts were in all cases fulfilled. Therefore, I believe that the fishery should be certified without need for additional conditions.		*Noted. See responses to detailed comments below where applicable.*

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]	**Yes/No**	**CAB Response**
Justification:		*N/A*

If included:

Do you think the client action plan is sufficient to close the conditions raised? [Reference FCR 7.11.2-7.11.3 and sub-clauses]	**Yes/No**	**CAB Response**
Justification:		*N/A*

Performance Indicator Review

Please complete the appropriate table(s) in relation to the CAB's Peer Review Draft Report:

- For reports using one of the default assessment trees (general, salmon or enhanced bivalves), please enter the details on the assessment outcome using Table 12.
- For reports using the Risk-Based Framework please enter the details on the assessment outcome at

Table 13.

- For reports assessing enhanced fisheries please enter the further details required at Table 14.

Table 15 For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
Example:1.1.2	*No*	*No*	*NA*	*The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks that there is evidence that rebuilding strategies 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 the timeline specified. However, no timeline has been specified based on previous performance, or simulation models.*	
1.1.1					(not scored)
1.1.2					(not scored)
1.2.1					(not scored)
1.2.2					(not scored)
1.2.3					(not scored)

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.4					(not scored)
2.1.1	Yes	Yes	N/A	Note: This scoring issue was rated using the risk-based framework. There are no primary species in this fishery. Therefore, the certifier gave a score of 100 by default. I think that it would be more fair to state N/A instead.	We followed MSC requirements.
2.1.2	Yes	Yes	N/A	Note: This scoring issue was rated using the risk-based framework. There are no primary species in this fishery. Therefore, the certifier gave a score of 100 by default. I think that it would be more fair to state N/A instead.	We followed MSC requirements.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.3	Yes	Yes	N/A	Note: This scoring issue was rated using the risk-based framework. There are no primary species in this fishery. Therefore, the certifier gave a score of 100 by default. I think that it would be more fair to state N/A instead.	We followed MSC requirements.
2.2.1	Yes	Yes	N/A	Note: This scoring issue was rated using the risk-based framework. The certifier raises some good points at the SG 100 level, which I do agree upon. The PSA rationale table (Annex 1.2.2a) is given only for starfish, not for Green shore crab. This should be added. The score of 80 is still justified.	Shore crab rationale added back into report (omitted by mistake)

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.2.2	Yes	Yes	N/A	Note: This scoring issue was rated using the risk-based framework. I agree with most points raised by the certifier. However, under score-post (c) the score should be raised to 90, as evidence is provided by testing of the catch when sold. Any unwanted catch would be identified. Score post (e) was not scored by the certifier. I think it should! Unwanted catch is specified as those species not covered under the plan (page 133; MSC Fish. Standard 2.0). Full survival of slipped or thrown away individuals is not proven. I'm not sure, if a regular review, as asked for at the SG80 level is already taking place. If interpreted in a slightly wider context, SG 80 might still be met.	In relation to SIc, we agree that SG100 is partially met. However, the MSC requirements for SGs to be met on an all or nothing basis – i.e. the only scores possible are 80 or 100. In relation to SIe, there is extensive discussion of this issue in the other peer review report – the same comments apply here.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.2.3	Yes	Yes	N/A	Note: This scoring issue was rated using the risk-based framework. The score of 80 is fully supported by available information. I would like to suggest a documentation of removed secondary species (amount and distribution) as well as an identification of minor secondary species, maybe in collaboration with science?	The recommendation is a good suggestion, and has been added.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.3.1	Yes	No	N/A	The certifier gave a score of 95. However, the SG100 asks for a high degree of confidence that there are no significant detrimental indirect effects on ETP species (guidepost (c). This is not met! There are stakeholder concerns, and the evaluation is still ongoing and not yet finalized. Therefore, SG 100 is not fullfilled. The overall score should be reduced to 80.	The scoring for this PI was not worked out correctly – the overall score should have been 90, not 95. In relation to SIc specifically, the stakeholders emphasised in the meeting that the issue of disturbance of seals and porpoise was a minor one, and population trajectories do not suggest any reason for concern. On this basis, the team considers that the score of 100 is appropriate, even without the results of the ongoing assessment.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.3.2	Yes	Yes	N/A	The provided evidence fully supports each element of the scoring guideposts on SG 80 level. Guidepost (e) was not rated, as there is no direct UoA-related mortality of ETP species. I think, however, that also indirect effects, which might lead to ETP mortality, should be included here. If scored, this guidepost would reach a score of 80.	The trouble with this is that it is extremely difficult to evaluate whether any of the possible indirect effects of the fishery on ETP species would result in any mortality – mortality associated with disturbance would most likely come in the form of a slightly higher probability of an individual dying from some other event later on, due to being in less good condition (for example). It is hard to see how this could be applied in practice.
2.3.3	Yes	Yes	N/A	A comprehensive strategy will be in place from 1st January 2017 onwards. To date, there is only a strategy, but still the SG80 is fully met.	Correct.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.4.1	Yes	No	N/A	Scoring issue (a) requires at SG100 that there is evidence that the UoA is highly unlikely to reduce structure and function of habitats. I disagree with the certifier concerning ephemeral seed mussel beds. It is highly unlikely (SG80) that the fishery will cause harm, but there is no evidence. SG100 is not met in this respect. Same applies for impacts of culture plots. There is no real evidence, it is nly highly unlikely. The overall score should be reduced to 90.	The aspect of the fishery which relates to fishing wild seed is given a score of 80 (that is UoA1). The score of 100 is given to UoA2 which is the part of the fishery that uses seed mussels taken from seed mussel collectors. These are not positioned near natural mussel beds so do not interact with them at all – hence why this part of the fishery scores 100. If I have understood the reviewer correctly, I think that the team and the reviewer are actually in agreement.
2.4.2	Yes	Yes	N/A	I fully agree with the certifiers scores and justifications. As 2 out of 4 SG100 criteria are met, the score of 90 is justified.	

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.4.3	Yes	No	N/A	Scoring issue (c) under SG100 asks for changes in habitat distributions over time being measured. This is partly done. A score of 90 would be justified, leading to an increase in the overall score to 85 instead of 80.	We agree, but where there is more than one scoring issue, each SG must be scored on an all or nothing basis – no credit can be given for 'partially met' in this case.
2.5.1	Yes	No	N/A	Some evidence exists, as asked for by SG100. However, subtidal mussel beds as well as eider ducks are key elements of the ecosystem for which no clear evidence exists. Therefore SG 100 is only partly met. The score should be reduced to 90.	Yes, but are they? There is only limited evidence that natural, non-ephemeral subtidal mussel beds even exist, and while eider ducks obviously important in their own right, it does not seem likely that they are a key driver of the Wadden Sea ecosystem. The team has made an effort here not to score 2.1-2.4 over again in this PI, but rather to consider what are the key elements of the ecosystem (which seems more likely to be tides and sand, more or less).

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.5.2	Yes	No	N/A	I agree with most statements made by the certifier. However, scoring issue (b) asks for TESTING that supports high confidence at the SG100 level. Testing is still missing for the issue of subtidal mussel beds. It will probably be fullfilled in the future, but not yet. SG 100 is only partly met, reducing the overall score to 90.	See comment above.
2.5.3	Yes	Yes	N/A	The score is fully justified. Under scoring issue (b), missing detailed investigation on the impact of noise on birds should be mentioned.	Is it really likely that this fishery is the main source of noise in this ecosystem? I would have thought that recreational boating would be much more significant.
3.1.1	Yes	Yes	N/A	All SG100 criteria are met. The full score is justified.	

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.2	Yes	Yes	N/A	The certifier raises some good points at the SG100 level. Especially facilitation could be improved. The score is fully acceptable.	
3.1.3	Yes	Yes	N/A	The fishery has clear long-term objectives which are required and explicit. The SG100 level is fullfilled. Congratulations.	☺
3.2.1	Yes	Yes	N/A	All SG 100 guideposts are met. The score of 100 is justified.	
3.2.2	Yes	Yes	N/A	The explanation to guidepost (b) states that SG 80 would not be met. Here, I disagree and believe that the arguments brought forward by the certifier fully justify SG 80 for this criterium. The final score of 85 is fine.	The reviewer has noticed a typo – that should read 'SG100 is not met'. Apologies.

Performance Indicator	Has all available relevant information 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. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.3	Yes	No	N/A	The use of the blackbox system is ground-breaking and could be a good example for other fisheries. Under guidepost (c) a high degree of confidence is asked for. As there is no observer programme, I think that SG100 is only partly met. The score should be reduced to 90. Accordingly, the overall score should be reduced to 90.	The team considered that the use of the black box system, alongside the confidence of the authorities when we met them, were sufficient to score a 'high degree of confidence' even in the absence of observers.
3.2.4	Yes	Yes	N/A	The score of 80 is fully justified.	

Table 16 For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process(es) applied to determine risk using the RBF has led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response:
1.1.1			N/A	
2.1.1			see comments under 2.1.1 above	see responses above
2.2.1			see comments under 2.2.1 above	see responses above
2.3.1			N/A	
2.4.1			N/A	
2.5.1			N/A	

Table 17 For reports assessing enhanced fisheries:

Does the report clearly evaluate any additional impacts that might arise from enhancement activities? Note: Justification to support your answers is only required where answers given are 'No'.	**Yes/No**	**CAB Response:**
Justification:		

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages

Appendix 3 Stakeholder submissions

Schleswig-Holstein Blue Shell Mussel Fishery Stakeholder Questionnaire SurveyMonkey

#2 **COMPLETE**

Answers Entered Manually

Collector: Web Link - Manual Entry 1 (Web Link)
Started: Thursday, January 14, 2016 8:47:10 AM
Last Modified: Thursday, January 14, 2016 1:42:11 PM
Time Spent: 04:55:01
IP Address: 80.252.104.241

PAGE 3: About You

Q1: **Please give us your contact details.**	
Name:	Workshop Sylt - 14th Jan. 2016
Company:	MEC
City/Town:	Lymington
Country:	UK
Email Address:	info@me-cert.com
Phone Number:	00441590613007

PAGE 4: Primary non-target species

Q2: **Are you concerned about the effect of this fishery on primary non-target species?**	No (if you select this choice you will be taken to the questions about secondary non-target species)

PAGE 5: Primary Non-target species Questionnaire

Q3: Which primary non-target species do you think are caught by this fishery? (You can select several options.)	*Respondent skipped this question*
Q4: Which primary non-target species do you think is a "main" component of the catch (i.e. makes up more than 5% of the catch, or 2% if the species stock is less resilient)? (You can select several options.)	*Respondent skipped this question*
Q5: Comments: do you have any further comments about primary non-target species?	*Respondent skipped this question*

PAGE 6: Secondary non-target species

Q6: **Are you concerned about the effect of this fishery on "secondary" non-target species?**	Yes (you will now be asked questions about secondary non-target species)

PAGE 7: Secondary Non-target species Questionnaire

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Schleswig-Holstein Blue Shell Mussel Fishery Stakeholder Questionnaire SurveyMonkey

Q7: **Which secondary non-target species do you think are caught by this fishery? (You can select several options.)**	Green crabs (Carcinus maenas), Starfish (Asteria rubens)
Q8: **Secondary non-target species:- which of the secondary species caught in the fishery do you feel is most at risk? (You can select more than one option)**	Green crabs (Carcinus maenas), Starfish (Asterias rubens)

Q9: **Areal overlap: what is the overlap between fishing effort and the stock of the secondary species most at risk (please select one option for each species).**

Green crab (Carcinus maenas)	Less than 10% overlap
Starfish (Asterias rubens)	Over 30% overlap
Please explain the basis for your choice.	Starfish - may be +ve impact from the culture plots. Conversely - starfish concentrated in the mussel areas.

Q10: **Encounterability: what is the overlap within the water column with the secondary species most at risk and the fishing gear used in this fishery?**

Green crab (Carcinus maenas)	High overlap with fishing gear (high encounterability)
Starfish (Asterias rubens)	High overlap with fishing gear (high encounterability)

Q11: **Selectivity of gear type: what is the potential of the fishing gear to retain secondary non-target species?.**

Green crab (Carcinus meanas)	Immature individuals regularly caught / smaller than half size can escape.
Starfish (Asterias rubens)	Immature individuals regularly caught / smaller than half size can escape.
Please explain the basis for your choice.	Stakeholders feel they are not certain. Lack of experience in fishing for mussels. Part of the cleaning (washed) process of the mussels allows for smaller individuals to return to the water. Part initially caught (comment from fishers).

Q12: **Post capture mortality: what is the chance that a species would be released if captured and subsequently survive?**

	Post capture mortality
Green crab (Carcinus meanas)	Evidence of some released postcapture and survival
Starfish (Asterias rubens)	Evidence of some released postcapture and survival
Brittle stars (Ophiura spp)	
Other	
Please explain the basis for your choice.	Some evidence of post release mortality in A.rubens. Team to look up.

PAGE 8: Endangered, Threatened & Protected Species

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Q13: **Are you concerned about the effect of the fishery on endangered, threatened or protected (ETP) species?**	Yes (you will now be asked questions about impacts on ETP species)

PAGE 9: ETP Species Questionnaire

Q14: **Which ETP species do you think are affected by this fishery? (You can select several options).**	Eider duck (Somateria mollissima), Harbour porpoise (Phocoena phocoena), Harbour seals (Phoca vitulina), Other species (please specify) Hypothetical - Flat oyster
Q15: Effects on populations: does the effect of the fishery on any of the species exceed national / international limits (you can select more than one option)	*Respondent skipped this question*
Q16: Direct effects: are the direct effects of the fishery likely to hinder the recovery of any of these species (you can select more than one option)	*Respondent skipped this question*
Q17: **Indirect effects: are the indirect effects of the fishery likely to create unacceptable impacts on any of these species (you can select more than one option)**	Eider duck (Somateria mollissima), Please provide evidence to support your response (e-mail to kat.collinson@me-cert.com if there is insufficient space here). Stakeholders agree there is an indirect impact - but probably not unacceptable. Awaiting results of EIA. Moulting area near Sylt.

PAGE 10: Marine Habitats

Q18: **Are you concerned about the effect of this fishery on marine habitats?**	Yes (you will now be asked questions about habitat impacts)

PAGE 11: Marine Habitats Questionnaire

Schleswig-Holstein Blue Shell Mussel Fishery Stakeholder Questionnaire SurveyMonkey

Q19: **Habitats in the area: Do you agree that the following habitats are found in the fishery area? (You can select several options).**	Fine sediments (sand / mud); Flat / rippled surface; Mussel beds , Fine sediments (sand / mud); Flat / rippled surface; Burrowing infauna , Medium sediments (gravel / pebbles); Low relief; Mussel beds , Medium sediments (gravel / pebbles); Low relief; Small erect fauna (sponges etc) , Large cobbles / boulders | Low relief | Small erect fauna , Other habitats (please specify) Possible subtidal biogenic reefs - mussel beds of 1 year or older. 2/3 different age classes. 'Stable' - lasted more than one winter, but still in protocol is progress.
Q20: **Habitat impacts: Which habitats do you think are affected by the fishery? (You can select several options).**	Please explain your choice. Possible biogenic reefs cannot develop. WWF comment. Culture plots can be habitat for other species.

Q21: **Additional comments: do you have any additional views about ecosystem interactions with this fishery?**

Creating a new habitat, which is hard structures in the water column. (also harbours and wind farms) although might be somewhat different)

PAGE 12: Ecosystems

Q22: **Are you concerned about the effect of the fishery on marine ecosystems?**	Yes (you will now be asked questions about ecosystem impacts)

PAGE 13: Ecosystems Questionnaire

Q23: **Which aspects of the marine ecosystem do you think may be affected by the fishery? (You can select more than one option).**	Species composition, Please list any other aspects / element of the ecosystem.that could be affected. new species on collectors? biomass higher than natural? but limited by Eckpunkt. potential competition with other filter-feeding organisms.
Q24: Additional comments: do you have any additional views about ecosystem interactions with this fishery?	*Respondent skipped this question*

PAGE 14: Further Comments

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Q25: Further comments: do you have any further comments about this fishery assessment?	*Respondent skipped this question*

(REQUIRED FOR FR AND PCR)

1. The report shall include all written submissions made by stakeholders about the public comment draft report in full, together with the explicit responses of the team to points raised in comments on the public comment draft report that identify:

a. Specifically what (if any) changes to scoring, rationales, or conditions have been made.
b. A substantiated justification for not making changes where stakeholders suggest changes but the team makes no change.

(Reference: FCR 7.15.5-7.15.6)

Appendix 4 Surveillance Frequency

1. The report shall include a rationale for any reduction from the default surveillance level following FCR 7.23.4 in Table 4.1.
2. The report shall include a rationale for any deviations from carrying out the surveillance audit before or after the anniversary date of certification in Table 4.2
3. The report shall include a completed fishery surveillance program in Table 4.3.

Table 4.1 : Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
e.g.3	*e.g.On-site audit*	*e.g. 1 auditor on-site with remote support from 1 auditor*	*e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.*

Table 4.2: Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
e.g. 1	*e.g. May 2014*	*e.g. July 2014*	*e.g. Scientific advice to be released in June 2014, proposal to postpone audit to include findings of scientific advice*

Table 4.3: Fishery Surveillance Program

Surveillance Level	Year 1	Year 2	Year 3	Year 4
e.g. Level 5	*e.g. On-site surveillance audit*	*e.g. On-site surveillance audit*	*e.g. On-site surveillance audit*	*e.g. On-site surveillance audit & re-certification site visit*

Appendix 5 Objections Process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)

The report shall include all written decisions arising from an objection.

Appendix 6 Stakeholders

Organisation	Contact	Email
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