

Marine Stewardship Council (MSC) Public Comment Draft Report

Scanfjord Swedish Rope Grown Mussel Fishery

On behalf of

Scanfjord Mollösund AB

Prepared by

Control Union Pesca Ltd

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From: Scanfjord Mollösund AB

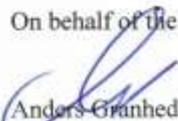
To: Control Union Pesca Ltd

Regarding: Certificate sharing arrangements for the Scanfjord Swedish Rope Grown Mussel Fishery.

Scanfjord Mollösund AB confirms its willingness to share the certificate for the MSC certification of its Scanfjord Swedish Rope Grown Mussel Fishery with Västkostmusslor HB, operating in the same region (West coast Sweden), and using the same technique (suspended mussel culture on ropes, nets or bands). These mussel growers may gain access to the benefits of MSC certification by:

-Agreeing to the fair and equitable sharing of internal and external costs of the certification process and future certification activities (like surveillance audits and re-certification), and
-Agreeing to any practices upon which certification relies, including any conditions and recommendations set for the certification, and the subsequent plans to address these conditions and recommendations.

On behalf of the Scanfjord Mollösund AB



Anders Granhed

Date: 3.11.18

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Glossary

Acronym	Definition
ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas
CAG	Catch-and-Grow
CAB	Conformity Assessment Body
CFP	Common Fisheries Policy
CMP	Conservation and Management Plan
DDT	Dichlorodiphenyltrichloroethane
EPA	Environmental Protection Agency
ETP species	Endangered, Threatened and Protected Species
EUNIS	European University Information Systems Organization
FCI	Food Certification International Ltd.
FCR	Fisheries Certification Requirements
FMC	Fisheries Monitoring Centre
IVL	IVL Swedish Environmental Research Institute
MEC	ME-Certification Ltd. (now known as Control Union Pesca)
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSFD	Marine Strategy Framework Directive
NFA	National Food Administration
OSPAR	Oslo-Paris Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)
PCB	Polychlorinated Biphenyl
SSPO	Swedish Shellfish Aquaculture Producer Organisation
SGU	Geological Survey of Sweden
SLU	Swedish University of Agricultural Sciences (Sveriges lantbruksuniversitet)
TAC	Total Allowable Catch
SwAM	Swedish Agency for Marine and Water Management
WFD	Water Framework Directive

1 Executive Summary

This report is the Public Comment Draft Report (PCDR) for the MSC full assessment of the Scanfjord Swedish Rope Grown Mussels by the Conformity Assessment Body (CAB) Control Union Pesca (CU Pesca; formerly ME Certification), for Scanfjord Mollösund AB.

Scanfjord Mollösund AB was a member of the Swedish Shellfish Producer Organisation (SSPO), through which it originally obtained the MSC certificate in 2014 and was also a part of the re-assessment of the SSPO Swedish West Coast Rope Grown Mussel fishery (re-certified in January 2019, see CU Pesca, 2019a). The company has decided to no longer be a member of SSPO, which means that they need to be assessed separately against the MSC Fisheries Certification Requirements (v2.0) to qualify for MSC certification.

Scanfjord has several mussel plots on the Swedish West coast, all using suspended bands to catch mussel seed, and grow the seed into consumer size mussel.

This fishery is an enhanced 'catch and grow' bivalve fishery, using habitat modification, without translocation. Since the fishery has no impact on the parent stock (and may even enhance the natural stock biomass through additional spat fall), Principle 1 is not scored (see Section 3.3). The fishery does not involve translocations, so there was no need to score the fishery against the genetic outcome PIs. Since this fishery is a catch-and-grow fishery based solely on spat collection (as opposed to dredging), without translocation, Primary and Secondary species components are not scored (see Section 3.4.1).

Management of mussel production for Sweden falls mainly under the purview of the National Board of Agriculture (in Swedish: Jordbruksverket), and the County Administrative Boards. The fishery is mainly managed through Västra Götaland County Administrative Board, which issues the licenses needed for the farms, and coordinates the control and enforcement of the license requirements.

In general, the key strengths of the fishery are:

1. There is limited interaction with ETP species. The only species of concern is Eider ducks (*Somateria mollissima*), which predate on the mussels. Farmers have stopped shooting the ducks to chase them away from the farms and opted for other measures to deter the birds instead, like chasing them away with speed boats, or placing nets around the farms.
2. The mussel farms typically operate in soft muddy habitats, which is the most commonly occurring bottom substrate type on the Swedish west coast. During the mussel license application process, the County Administrative Board carries out an assessment of the area to which the license applies. In this assessment, the suitability of the habitat in relation to the mussel farm, and the presence of nearby nature conservation areas are taken into account.
3. Mussel farms are regarded by the County Administrative Board as 'low risk' with regards to habitat and the environment: The impact/effects from mussels are regarded as small and mostly positive with regards to eutrophication. In assessing the impact of a new proposed farm, the County Administrative Board makes use of the information available on environmental aspects, as well as sea floor parameters.
4. The carrying capacity of the mussel farming areas along the Swedish West Coast is not deemed to be a limiting factor or likely to be heavily impacted by the mussel farms. The levels of eutrophication are high in both the Skagerrak/Kattegat and the Baltic. Mussel

farming is seen as a way of reducing the level of eutrophication and improving the water quality.

5. The fishery is well managed, with continuous consultation and close cooperation between governmental agencies and user-group organizations – this is in line with the general ‘consensus culture’ in the country.

The key weakness of this fishery is the lack of site-specific long-term monitoring of (potential) effects underneath the mussel farms. The view that mussel farming is not only low-impact, but beneficial to the environment has resulted in limited information required from producers and limited fisheries-specific management to date.

The team’s provisional determination is that the fishery meets the criteria for MSC certification.

Aggregate scores for each Principle are as shown in the following table:

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	Not scored
Principle 2 – Ecosystem	84.4
Principle 3 – Management System	92.9

2. Authorship and Peer Reviewers

Cora Seip acted as team leader with overall responsibility for the assessment and for Principle 2.

Cora meets the Fishery Team Leader criteria in Table PC1. She has a Master’s degree in Biology from Leiden University, and has passed the MSC online fishery team leader training.

Previously, she worked for the Dutch Fish Product Board from 2007-2013 as Policy Officer, 'Nature and Spatial Planning'. Her work focused mainly on Natura 2000 procedures, shrimp and flatfish fisheries and included the Marine Framework Directive. She was also shellfish Policy Officer and worked closely with the Dutch shellfish industry (mainly mussels, but also oysters, *Ensis spp.*, and cockles). From 2013-2017 Cora worked as an expert independent consultant to a broad cross-section of fishing organisations. Notable achievements include working on assessment of Dutch fisheries (both generic and specific) and their impacts, as well as working as an advisor with regards to spatial planning, and nature conservation laws.

Cora has > 5 years’ experience in research into the management of fisheries impacts on aquatic ecosystems meeting the criteria for ‘Fishing impacts on aquatic ecosystems’ in table PC3 through her work summarised above.

Geir Hønneland had primary responsibility for Principle 3. Geir Hønneland holds a PhD in political science from the University of Oslo (2000) and has studied international fisheries management (with main emphasis on enforcement and compliance issues), international environmental politics and international relations in Polar regions. He has been affiliated with the Fridtjof Nansen Institute in Oslo for more than 20 years and has acted as director since 2015. Among his fisheries-related books are Making Fishery Agreements Work (Edward Elgar, 2012; China Ocean Press, 2016), Law and Politics in Ocean Governance: the UN Fish Stocks Agreement and Regional Fisheries Management Regimes

(Martinus Nijhoff, 2006) and Coercive and Discursive Compliance Mechanisms in the Management of Natural Resources (Kluwer, 2000; Springer, 2014). Before embarking on an academic career, he worked five years for the Norwegian Coast Guard, where he was trained and certified as a fisheries inspector. Geir has been involved in MSC assessments since 2009 and has acted as Principle 3 expert in more than 30 full assessments and re-assessments, as well as several pre-assessments and surveillance audits. His experience in full assessments includes many demersal, pelagic and reduction fisheries in the Northeast Atlantic and Southern Ocean, as well as inland and bivalve fisheries. In the Northeast Atlantic, he has covered the international management regimes in the Barents Sea, Norwegian Sea, North Sea, Skagerrak, Kattegat and the Baltic Sea, and the national management regimes in Norway, Sweden, Denmark, Russia, Iceland, Faroe Islands, Greenland and Scotland, as well as the EU level and the enforcement component of other EU countries, such as Germany, the Netherlands and the UK. Geir speaks both Swedish and Danish.

Geir meets the criteria for 'Fishery management and operations' and 'Current knowledge of the country, language and local fishery context' in table PC3 through his work summarised above.

A review of the Team Leader and assessor's work history found no conflict of interest with the assessed fishery.

Full CVs for all team members have been submitted to the MSC separately.

The **peer reviewers** for this re-assessment were selected from a shortlist as compiled MSC Peer Review College. The following two peer reviewers, who have reviewed the SSPO Swedish West Coast Rope Grown Mussel Fishery, were selected to peer review this assessment to provide consistency, since this company is currently still part of the SSPO Swedish West Coast Rope Grown Mussel Fishery (currently in re-assessment) and has been included in the client group for the re-assessment of that fishery:

- Mette Blæsbjerg
- Terence James Holt

Mette Blæsbjerg is a marine biologist from Denmark with numerous years of experience with fisheries management, sustainability and marine conservation. She holds a BSc in Marine and Freshwater Biology from the University of Essex (UK) and a MSc in Biological Sciences from the University of Copenhagen (DK). For more than 10 years Ms Blæsbjerg has worked for the National Institute of Aquatic Resources (DTU Aqua) and for the Worldwide Fund for Nature (WWF) in Denmark. Her work has primarily focused on environmental impacts of fisheries, for example bycatch of ETP-species and assessments of benthic impacts, as well as evaluations of management systems such as marine spatial planning and MPA's. At WWF she has also been very involved in fisheries and environmental policies at both the national and European level, with a focus on sustainable fisheries and marine biodiversity (specific policies have included e.g. the CFP, MSFD and Natura 2000). She has also worked on sustainable seafood assessments, as well as being a project manager for WWF Denmark's citizen science project "Discover the Sea". Ms Blæsbjerg has also over the years particularly worked on mussel fisheries in Denmark, both as a researcher and as a stakeholder, for example during the development of a new Danish mussel policy. Furthermore, she has also worked on specific projects and issues related to fisheries for plaice, cod and Nephrops. Mette now works independently and is

amongst others involved in a number of marine educational projects for schools and for the public in and around Copenhagen.

Dr Terence James Holt is an independent marine environmental, with longstanding experience of managing marine consultancy projects, assessments and surveys. He holds a BSc. degree in Marine biology and a Ph.D. in Seaweed Cultivation. He is a former director of CMACS Ltd and Niras Consulting Ltd, and has over 35 years' experience in seabed ecology, including shellfish ecology, marine aquaculture (both research and commercial), fish and invertebrate surveys including scallops and other commercial shellfish, seabed surveys including trawl, dredge, grab, pots, camera and acoustic, and a variety of environmental impact assessments. He has provided expert advice on molluscan fisheries at planning enquiries, and has published on trawl damage to seabed communities and on sensitivities of biogenic reef habitats. Dr Holt has been involved in MSC pre-assessments, main assessments, annual audits and peer reviews for queen scallops, mussels, cockles, clams and oysters in Europe, Canada and South east Asia since 2001, and has also contributed to pre- and full assessments of longline and trawl fisheries. He contributed at early MSC workshops on the development of generic scoring guidelines and refining of assessment method. In 2000 he carried out a preliminary assessment of a number of U.S. aquarium fish wholesalers and retailers against draft sustainability standards on behalf of MAC (Marine Aquarium Council). He has also carried out assessments of fishing vessels/crew under the UK Sea Fish Industry Authority's Responsible Fishing Scheme, and passed the training course for the MSC's recently released standards for seaweed certification.

3 Description of the Fishery

3.1 Unit(s) of Assessment (UoA) and Scope of Certification Sought

3.1.1 UoA and Proposed Unit of Certification (UoC)

CU Pesca confirms that the fishery under assessment is within the scope of the MSC Fisheries Standard (7.4 of the MSC Certification Requirements v2.0):

- The target species is not an amphibian, reptile, bird or mammal;
- The fishery does not use poisons or explosives;
- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- The client or client group does not include an entity that has been successfully prosecuted for a forced labour violation in the last 2 years;
- The fishery has in place a mechanism for resolving disputes, and disputes do not overwhelm the fishery;
- The fishery is not an introduced species-based fishery as per the MSC FCR 7.4.4.;
- The fishery is enhanced see section 3.1.4;
- IPI stocks are not caught see description in Section 3.3;

- The fishery doesn't overlap with other fisheries, due to the nature of the farms, and the fact that they are located close to shore. The fishery is adjacent to oyster fisheries
- The fishery is defined as enhanced 'catch and grow' bivalve fishery, using habitat modification, without translocation.

UoA

Species	Blue mussels (<i>Mytilus edulis</i>)
Geographical range	Skagerrak & Kattegat, ICES subdivision IIIa – Swedish territorial waters
Method of capture	Suspended substrate (ropes/bands/nets)
Stock	Skagerrak & Kattegat
Management Systems	Västra Götaland County Administrative Board, Swedish Board of Agriculture
Client group	Scanfjord Mollösund AB
Other eligible fishers	Mussel farms on the West coast of Sweden using the same technique (rope grown), as licensed by Västra Götaland County Administrative Board.

3.1.2 Final UoC(s)

(PCR ONLY)

The PCR shall describe:

- The UoC(s) at the time of certification.
- A rationale for any changes to the proposed UoC(s) in section 3.1(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 by a fixed overall TAC, but through a license-system. There are permits given for approximately in total 13,000 t (20,000 t per production cycle, which is approximately 18 months), with the long-term objective to grow the production to 50,000 t (personal comment Mr. Larsson from the Västra Götaland County Administrative Board), of which Scanfjord has around 95% of production capacity. The recent production (harvest) by Scanfjord has been outlined in Table 1:

Table 1. Production of blue mussels by Scanfjord (source: Scanfjord Mollösund AB)

Year	Blue mussels (t)
2017	1,692
2016	1,833
2015	1,496

2014	1,770
2013	1,702

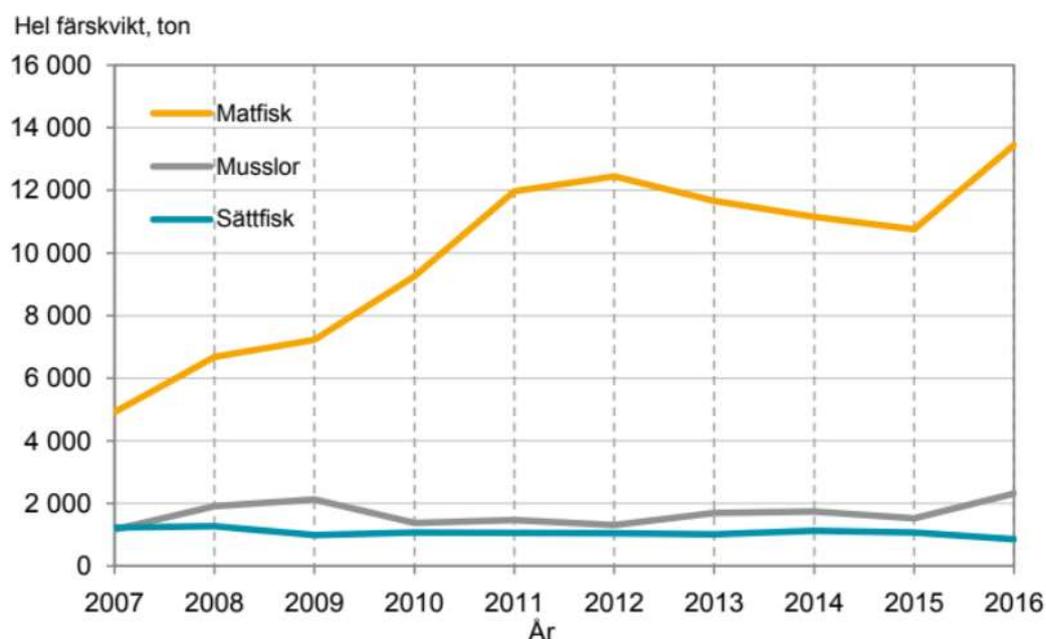


Figure 1. Production in Swedish aquaculture 2007-2016 (source: Figur A Produktion inom svenskt vattenbruk 2007 – 2016 in Sveriges officiella statistik, 2017).

Legenda: Matfisk: fish for food; Musslor: mussels; Sättfisk: fish for restocking purposes (compensation of wild stock effects, e.g. power plants)

Blue mussels have been farmed in Sweden since the 1970s by Scanfjord, which was one of the first rope grown mussel farms. The production level of blue mussels in Sweden has been quite stable over time (as can also be seen in Musslor - Figure 1), with a maximum production of 2,500 t (in 1987). The harvest of farmed mussels in 2017 on the Swedish West coast grew to 1,834 t overall, with Scanfjord Mollösund AB accounting for around 95 % of production volume.

3.1.4 Scope of Assessment in Relation to Enhanced Fisheries

The fisheries are a 'Catch and Grow' fishery, using habitat modification using buoys and bands.

The criteria for determining whether the fishery is enhanced are shown in Table 2. The fishery qualifies for criteria Ai-Aiii (there is no hatch-and-catch), B, and C.

With regards to criteria Ai-Aiii: the system relies upon the capture of mussel from the wild environment. *M. edulis* is native to the geographic region of the fishery (West coast Sweden), and the spat collected comes from natural spat fall. The grow-out of the mussels takes place on the suspended mussel farms, and mussel seed needed for the suspended mussel fishery is collected on the same systems. Spat collection makes use of floating devices that provide a surface area (bands) for the wild mussel spat to settle and grow on (Catch and Grow).

The collection of spat and further on growing is also an enhanced fishery of the type HM (Habitat Modified). Natural mussel spat normally settles on the sea bottom or on substrates in the water or on the sea floor.

At no point is there augmentation of the food supply, nor does the fishery routinely require disease prevention involving chemicals or compounds with medicinal prophylactic properties, meeting criteria Bi and Bii. Habitat impacts (criteria C) are reversible (and will be further discussed under PI 2.4).

Table 2. MSC scope criteria for enhanced fisheries.

A	Linkages to and maintenance of a wild stock
i	At some point in the production process, the system relies upon the capture of fish from the wild environment. Such fish may be taken at any stage of the life cycle including eggs, larvae, juveniles or adults. The 'wild environment' in this context includes marine, freshwater and any other aquatic ecosystems.
ii	The species are native to the geographic region of the fishery and the natural production areas from which the fishery's catch originates unless MSC has accepted a variation request to include introduced species for the pilot phase.
iii	There are natural reproductive components of the stock from which the fishery's catch originates that maintain themselves without having to be restocked every year.
iv	Where fish stocking is used in hatch-and-catch (HAC) systems, such stocking does not form a major part of a current rebuilding plan for depleted stocks. Note: This requirement shall apply to the "current" status of the fishery. Wild stocks shall be managed by other conventional means. If rebuilding has been done by stocking in the past, it shall not result in an out-of-scope determination as long as other measures are now in place.
B	Feeding and Husbandry
i	The production system operates without substantial augmentation of food supply. In HAC systems, any feeding is used only to grow the animals to a small size prior to release (not more than 10% of the average adult maximum weight), such that most of the total growth (not less than 90%) is achieved during the wild phase. In catch-and-grow (CAG) systems, feeding during the captive phase is only by natural means (e.g., filter feeding in mussels), or at a level and duration that provide only for the maintenance of condition (e.g., crustacean in holding tanks) rather than to achieve growth.
ii	In CAG systems, production during the captive phase does not routinely require disease prevention involving chemicals or compounds with medicinal prophylactic properties.
C	Habitat and ecosystem impacts
i	Any modifications to the habitat of the stock are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure and function. Note: Habitat modifications that are not reversible, are already in place and are not created specifically, for the fishery shall be in scope. This includes: Large-scale artificial reefs. Structures associated with enhancement activities that do not cause irreversible harm to the natural

3.2 Overview of the fishery

3.2.1 The Client fishery

The fishery is conducted by Scanfjord Mollosund AB. The company is currently covered by the MSC certificate of the Swedish Shellfish Aquaculture Producer Organisation (SSPO Swedish West coast rope grown mussels: in re-assessment), but will be leaving the SSPO in the summer of 2019, and from then on no longer be covered by their certificate. Scanfjord works together with Västkostmusslor HB, which may become covered under Scanfjord's certificate in the future. There is a certificate sharing agreement in place for this situation (see Appendix 6 Certificate sharing agreement). Västkostmusslor

HB operates in the same way as Scanfjord (albeit on a much smaller scale), and is also currently covered by the SSPO certificate, and part of the SSPO MSC re-assessment.

3.2.2 History of the fishery and its management

Scanfjord started in 1979, as part of a research project. The technical school in Gothenburg was interested to see if and how mussels could be grown. Scanfjord is the only company remaining from that initial project. There was no local market for mussels at that time, so mussels were exported to Germany, Belgium and The Netherlands. From the 1980's, demand in Sweden for blue mussels slowly grew. Currently Sweden is Scanfjord's main market, together with Norway, although some export to The Netherlands remains.

The farms started with a long-line system, which was developed during the research project. The initial set-up was similar to what is still used today, although current practices have become more efficient. The materials used for the ropes and long-lines has changed, to give the farms a longer life span (20-25 years).

The production level of blue mussels in Sweden has been quite stable over time and was at its peak around 2,500 t (1987). A major reason for the decline in the 1980s was the increased spread of toxic algae, which affected and still affects mussel farms throughout Europe. Methods of sampling toxin presence have evolved over the years and today, this is not a major obstacle to development of the industry (FCI, 2014).

Around 1,500-1,900 t are harvested each year in total along the Swedish West coast, with Scanfjord making up around 95 % of the harvest. There are permits given for approximately 13,000 t (20,000 t per production cycle, which is approximately 18 months). Since the production has not even reached the level for the total permits given, the current production volume is not regarded as a problem e.g. considering the carrying capacity of the ecosystem, discussed further under Section 3.4.4. The size and intensity of the Swedish West coast rope grown mussel farming has not changed much since the initial assessment (1,531 t in 2012).

Mussel production is the responsibility of the Board of Agriculture and County Administrative Boards.

Mussel production by both Scanfjord and Västskustmusslor HB occurs in Swedish inshore waters less than one nautical mile from shore and often within 300 m of shore.



Figure 2. Mussel farm locations (blue ovals) on the Swedish west coast (Source: FCI, 2014), with the Scanfjord farms located around Orust.

The County Administrative Board, in line with requirements under Sweden’s Environmental Code and the Fisheries Act, issue permits for production operations. Ownership of the seabed and water out to 300 m from the shore is generally private, and permission from the landowner must be sought. Beyond 300 m from the shore, ownership is by the state and a contract is provided by the Swedish Judicial Board to allow the use of a given area for mussel production. Permission is granted for five years in the first instance and following a number of five-yearly renewals the permit can be extended to ten years.

The Swedish mussel production taking part in this assessment occurs within the boundaries of the Västra Götalands County Administrative Board. The County Administrative Board has currently given out 100 licenses of which around 55 permits are currently in use. Those 55 licenses range from 0.5 ha

to 10 ha, with around 250 ha in total in use for mussel farms. Scanfjord has 27 licenses, covering 227 ha, whereas Väst kustmusslor has 2 licenses, covering a total of 1.5 ha. All farms are situated in the fjords around Orust, which have distinct characteristics. Areas closer to the sea are more nutrient-rich, but also have a higher risk of algal blooms resulting in the bivalve toxin DSP (diuretic shellfish poison). The areas more inshore are less nutrient rich and have therefore less problems with toxic algae. This provides flexibility for the company around temporary closures of shellfish production areas (due to food safety-issues) and allows for continuous operations throughout the year.

3.2.3 Gear and operation of the fishery

The blue mussel, *Mytilus edulis*, is a sessile bivalve. It lives attached to a substratum of shells, shell fragments or pebbles by its byssus threads. Mussels may form banks on soft bottom substrates by attaching to shells or shell fragments and by forming attachment to other mussels. Blue mussels occur predominantly in estuaries which are usually characterized by large variation in turbidity, salinity and hydrodynamics. Consequently, mussels can withstand a wide variation in environmental conditions. Mussels occur in subtidal and intertidal areas; hence they can survive regular emersion.

Mussel reproduction takes place in the spring and summer and is dependent on water temperature. Mussel spawning along the Swedish west coast generally takes place in May-June. Mussels release huge numbers of gametes (several million eggs per spawning period) into the water where fertilization takes place. The fertilized egg develops into a planktonic drifting larva which undergoes several metamorphoses before settlement. The planktonic life of *M. edulis* is normally no longer than 2 to 4 weeks depending on temperature, food supply and availability of suitable settlement substrate. It can take 10 weeks between the fertilization and the settlement of the mussel. Therefore, the settlement period generally is in May-August for the area under assessment.

Both Scanfjord and Väst kustmusslor use the Scanfjord-system, with bands as a suitable substrate for the mussel larvae (spat) to settle on and the adult mussels grow out to consumer size.

The lines carrying the substrates are attached to a series of buoys (polypropylene barrels). The spacing of the plastic floats (buoys) depends upon their buoyancy and the expected load upon the line. Scanfjord prefers to use as little buoys as possible: with less buoys, the farms 'bounce' less on the water and the mussels form less byssus threads to stay attached, which means less cleaning of the mussels after harvest. This is also the reason most mussel farms are in sheltered areas, so they are more protected from wind and waves.

The length of the hanging substrate (bands) hanging down depends on the water depth at low tide, so that the bottom of the long lines never touches the sea bed. The length of the carrying line is generally around 200 m (along the water surface) and the depth of the culture may be 6-20 m, but generally reaches around 6-8 m deep and occurs in areas of around 10-12 m deep. The separation between carrying lines is largely dependent upon the size of the servicing vessel or the productivity requirements. The overall dimension of each culture site is tailored to the license conditions, that outline the coordinates where the farms can be located.

The carrying lines are anchored to the seabed by plough anchors which are forced into the seabed (one in each corner of the culture site).

Both Scanfjord and Väst kustmusslor choose to grow out the collected spat on the same bands as they are caught on, without any interfering.



Figure 3. Long-line system with buoys, top/carrying line and growth lines attached (photo taken at site visit)

To harvest the mussels, the substrate bands are raised from the water and the mussels are removed either by machine (rotating brushes). The company is testing harvest underwater via a venturi-system, which means the mussels are brushed off the bands and pumped on board).



Figure 4. Harvesting of longlines: the lines get lifted, cut, and are transported on board, where they are placed in big bags (photo taken at site visit)

The mussels are then transferred to a shore-based facility or are packed for transport.

3.2.4 Fishing areas and seasons

The grow-out of mussels on bands is a year-round practice. The mussel spawning in May-June and the settling of spat that occurs around 2 weeks later, determining most of the activities of the farmers. Harvest of consumption-size mussels may take place any time of the year, depending on e.g. mussel size, growth and market.

The growth cycle for the Swedish blue mussels is 1-2 years, depending on the market and the required size of the mussel. Norway and Sweden are the main markets. There is also a market in France and The Netherlands, with France demanding a smaller shell in comparison with The Netherlands.

3.3 Principle One: Target Species Background

As per FCR:2.0 SB2.1, the team has assessed the extent of translocations, and the possible impact on the parent stock. The extent of translocations must be considered to ensure that the fishery enhancement programmes predominantly utilise stocks or populations that are native to the natural production area from which the fishery's catch originates (FCR: G7.7.4.1.b).

The method for the collection of seed in this enhanced catch and grow fishery are spat collectors (bands in the water column). Seed collected this way is never relocated but grown out in the same spot to where it is caught.

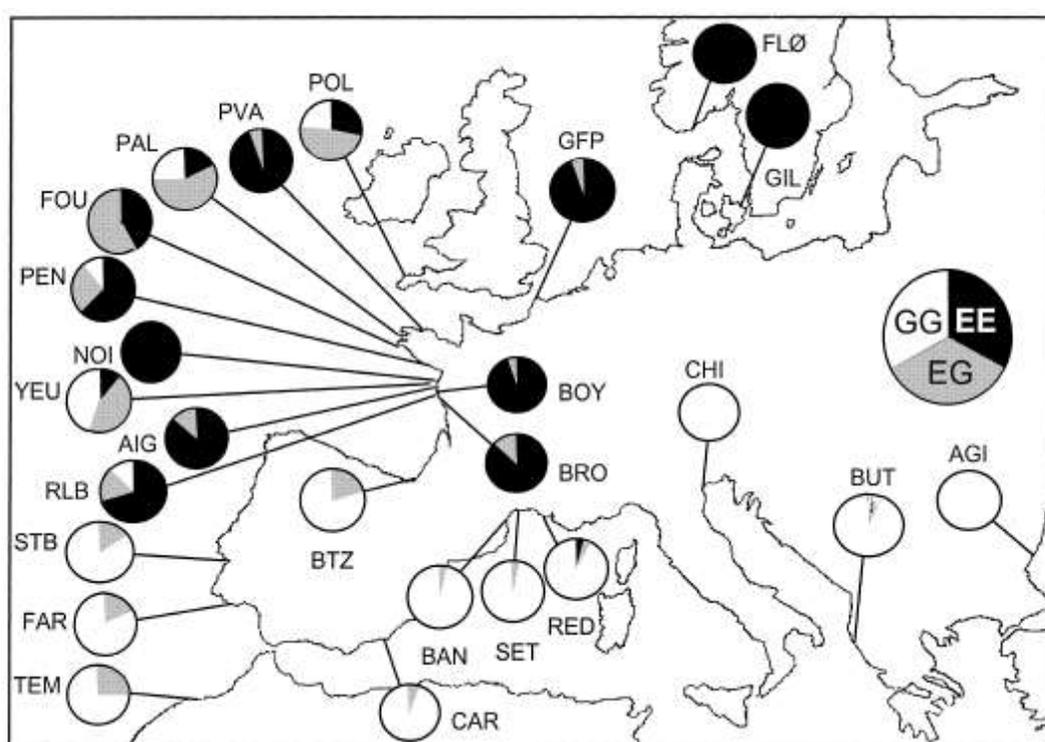


Figure 5. Proportional genetic composition of mussels in samples from around Europe. GG=*M. galloprovincialis*, EE=*M. edulis*, EG=hybrid (Daguin et al., 2001).

Within the genus *Mytilus* there are three species found in Europe: *Mytilus edulis*, *M. galloprovincialis* and *M. trossulus* (see Figure 5) *M. edulis* is the species assessed in this certification and it does not overlap with any other *Mytilus* species on the Swedish west coast.

The mussels collected and moved, are of the same species and are all within the UoC. Based on this, the team have decided that mussel translocations are not relevant to this fishery. The fishery is defined as **enhanced catch-and-grow (CAG) bivalve fishery without translocation**.

The team's evaluation of the parent stock is that, as all the UoAs under assessment involves the use of spat collectors and the grow-out of the collected mussel spat, the net effect is that the rope growing-activities will increase the local mussel stock biomass. It has therefore been assessed that the cultivation of mussels does not pose a risk to the productivity of the wild population.

The team conclude that, in accordance with the Fisheries Certification Requirements SB2.1.4 – ‘*If an enhanced CAG bivalve fishery does not involve translocations, and there is no evidence that it negatively impacts the parent stock, teams may choose not to score Principle 1*’, Principle 1 does not need to be included in this full assessment.

Additionally, for similar reasons, Genetic outcome PI 1.1.3 will not need to be scored as SB2.1.5.2 is not satisfied SB2.1.5.2- ‘*Enhanced CAG bivalve fisheries that involve translocations shall also be scored against the Genetic outcome PI 1.1.3*’.

3.4 Principle Two: Ecosystem Background

3.4.1 Designation of species under Principle 2

The fishery’s impact of non-target species is analysed differently if the species is from a “managed” stock or not, or considered Endangered, Threatened or Protected (ETP). These are defined as follows:

Primary species (MSC Component 2.1):

- Species in the catch that are not covered under P1
- Species that are within scope of the MSC program, i.e. no amphibians, reptiles, birds or mammals
- Species where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit (LRP) or target reference points (TRP). Primary species can therefore also be referred to as ‘managed species’.

Secondary species (MSC Component 2.2):

- Species in the catch that are not covered under P1
- Species that are not managed in accordance with limit or target reference points, i.e. do not meet the primary species criteria
- Species that are out of scope of the programme, but where the definition of ETP species is not applicable (see below).

ETP (Endangered, Threatened or Protected) species (MSC Component 2.3) are assigned as follows:

- Species that are recognised by national ETP legislation
- Species listed in binding international agreements (e.g. CITES, Convention on Migratory Species (CMS), ACAP, etc.)
- Species classified as ‘out-of scope’ (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

Both **primary** and **secondary** species are defined as ‘main’ if they meet the following criteria:

- The catch comprises 5 % or more by weight of the total catch of all species by the UoC;
- The species is classified as ‘less resilient’ and comprises 2 % or more by weight of the total catch of all species by the UoC. Less resilient is defined here as having low to medium productivity, or species for which resilience has been lowered due to anthropogenic or natural changes to its life-history;
- The species is out of scope but is not considered an ETP species (secondary species only);

- Exceptions to the rule may apply in the case of exceptionally large catches of bycatch species.

Suspended mussel farming produces predominantly mussels. When mussel densities are kept high, other organisms get little opportunity to grow along with them. However, whatever grows with suspended mussels will be harvested together with them. This cultch is removed while cleaning and packing the mussels. Cultch of rope grown mussels varies roughly between 5 % and 10 % of the harvest.

Since this fishery is a catch-and-grow fishery based solely on spat collection (as opposed to dredging), without translocation, Primary and Secondary species components don't have to be scored as per SB 3.1.1. The fishery will be assessed according to Figure 6.

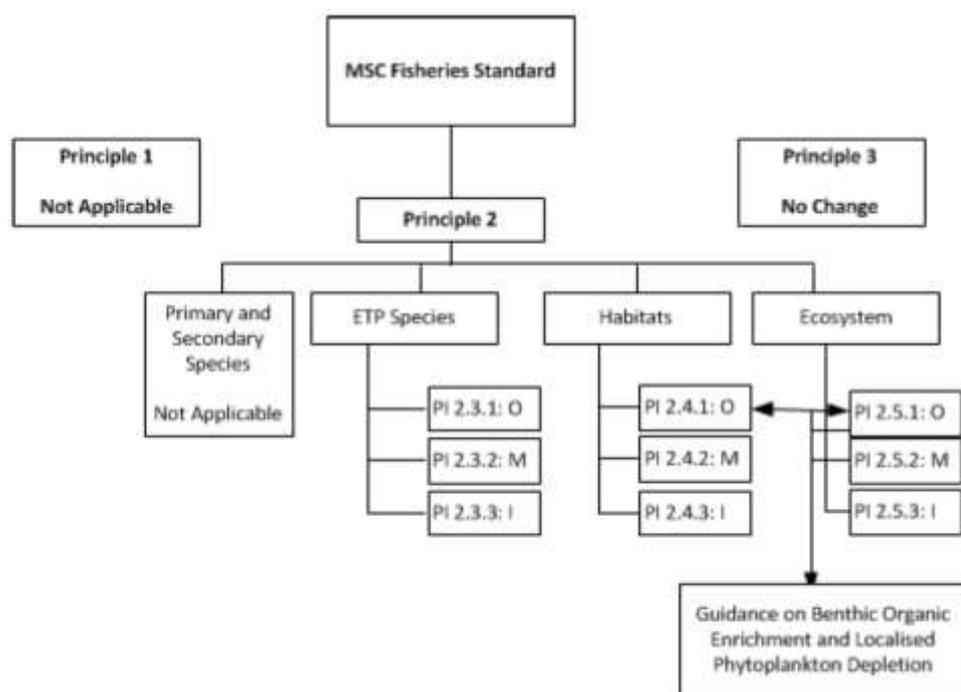


Figure 6. Enhanced catch and growth bivalve fishery based solely on spat-collection (source: Figure GSB5 in FCR 2.0 MSC, 2014)

3.4.2 Endangered, Threatened or Protected (ETP) species

Mussel culture on ropes have limited interaction with fish species. Although fish may use the leases with rope grown mussels as breeding and refuge habitats, fish are not caught during the harvest of the mussels. There is therefore no effect on protected or endangered fish species, and these are not considered further in this assessment.

The ETP species groups where impacts are possible are marine mammals and birds. Since this enhanced fishery is not using an active fishing gear, accidental catch of ETP species could happen only through attachment and entanglement to the ropes the mussels grow on, or to the mussels themselves. Other possible effects are: entanglement in mussel farm structures and spat catching structures, ingestion of litter from farms, changed prey abundance due to phytoplankton depletion, exclusion by farm structures, reduced or increasing prey availability, disturbance (noise or boat activity), creation of resting places on floats within farms (Lloyd, 2003 in FCI, 2014).

According to the Swedish Red List (2015) produced by Artdatabanken, SLU (Swedish University of Agricultural Sciences) the species in these species groups along the Swedish west coast classified as nearly threatened (NT), vulnerable (VU), endangered (EN) and critically endangered (CR) are presented in Table 3. Threatened species are all species that classify as CR, EN and VU (Artdatabanken, 2015).

Table 3. Mammals and birds on the Swedish Red List (source: Artdatabanken, 2015)

Latin name	Common name	Red list category
<i>Gavia stellata</i>	Red-throated Diver	Nearly threatened (NT)
<i>Podiceps nigricollis</i>	Black-necked grebe	Endangered (EN)
<i>Aythya marila</i>	Scaup	Vulnerable (VU)
<i>Somateria mollissima</i>	Eider	Vulnerable (VU)
<i>Melanitta fusca</i>	Velvet Scoter	Nearly threatened (NT)
<i>Limosa limosa</i>	Black-tailed godwit	Critically endangered (CR)
<i>Larus argentatus</i>	European Herring Gull	Vulnerable (VU)
<i>Larus fuscus</i>	Lesser Black-backed Gull	Nearly threatened (NT)
<i>Rissa tridactyla</i>	Kittiwake	Endangered (EN)
<i>Sterna sandvicensis</i>	Sandwich tern	Vulnerable (VU)
<i>Sternula albifrons</i>	Little tern	Vulnerable (VU)
<i>Cephus grylle</i>	Black Guillemot	Nearly threatened (NT)
<i>Phocoena phocoena</i>	Harbour porpoise	Vulnerable (VU)

3.4.2.1 Marine mammals

The ETP species identified in Table 3 presents mammals and birds defined as threatened on different levels by the Swedish Red List. The only mammal included on the list is harbour porpoise (*Phocoena phocoena*). The harbour porpoise is a CITES Appendix II species and is listed in Annex II and IV of the Habitats Directive (92/43/EEC), Annex II of the Bern convention and Annex II of the Bonn convention. Furthermore, it is the flagship species in the “Agreement on the conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas” (ASCOBANS). ASCOBANS seeks to formalise and coordinate conservation efforts for small cetacean species shared between member countries in the ASCOBANS Area through threat management, e.g. bycatch, habitat deterioration, or other anthropogenic disturbances. Given the highly migratory nature of the harbour porpoise, such co-ordinated efforts are necessary to form an effective conservation and management plan (CMP). The CMP formed under ASCOBANS requires all signatories to engage in habitat conservation and management programmes, surveys and research, pollution mitigation and public engagement. Sweden is signatory to the ASCOBANS agreement, which was concluded in 1991 under the auspices of the Convention on Migratory Species (CMS or Bonn Convention) and entered into force in 1994. Several Natura 2000 sites are designated because of significant use of the areas by harbour porpoise within the North Sea, Kattegat and Skagerrak (see Figure 7).



Figure 7. Natura2000 sites within which harbour porpoise is listed as a qualifying designated species. (Source: European Environment Agency)

In 2008, ICES was asked to evaluate the bycatch of harbour porpoises in the Greater North Sea Ecoregion. At the Third Meeting of Parties to ASCOBANS in 2000, a resolution addressed the issue of porpoise bycatch. Resolution No. 3, set a definite limit for incidental bycatch based on advice from the International Whaling Commission (IWC) / ASCOBANS Working Group on harbour porpoises. This defined “unacceptable interactions” as being a total anthropogenic removal $>1.7\%$ of the best available population estimate and set an objective of reducing bycatch to $<1\%$ of the best available population estimate (ASCOBANS, 2000).

The former Board of Fisheries and the Environmental Protection Agency jointly developed an action plan to preserve the harbour porpoise, the only cetacean species that occur year-round in Swedish waters. Bycatch in fisheries, pollution and ever-increasing boat traffic are some of the main causes of decreases in porpoise-numbers around the Swedish coast.

Both grey (*Halichoerus grypus*) and common or harbour (*Phoca vitulina*) seals are common in the Swedish coastal area. Both species are listed as being of ‘Least Concern’ in Europe (IUCN, 2007b, 2007c). Both species feed on a wide variety of fish species including cod, sole, sand eels, salmon and herring with common seals also taking cephalopods and crustaceans. The current population trend for the grey seal is that it is increasing (IUCN, 2007b). The overall trend for the common seal is reported as generally stable but declining in some areas around the UK, although it remains classified as of ‘Least Concern’ in the Skagerrak and Kattegat and the North Sea (IUCN, 2007c; Hanson *et al.*, 2013; HELCOM, 2013a; OSPAR, 2017).

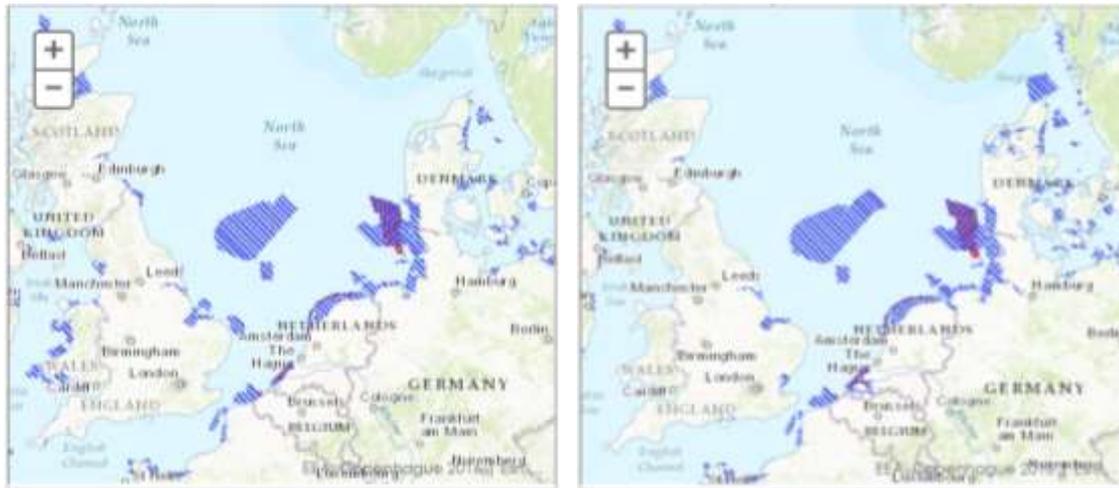


Figure 8. Natura 2000 sites within which grey seals (left) and common seals (right) are listed as qualifying designated species (Source: European Environment Agency)

Several Natura 2000 sites are designated on account of significant use of the areas by either or both grey and common seals within the North Sea, Kattegat and Skagerrak (**Figure 8**). Both grey and common seals are listed on Annexes II and V of the Habitats Directive (92/43/EEC), Annexes II and II of the Bern Convention, Annex II of the Bonn convention and in the Agreement of Conservation of Seals in the Wadden Sea.

Threats to both species of seal include entanglement in fishing gears and pollution, the latter mainly from PCBs and DDT in Baltic populations but also from oil spills etc.; knock-on effects can include immunosuppression resulting in poorer condition of individuals. Grey seals carry the phocine distemper virus (PDV) but rarely suffer mortality as a result whereas common seal populations have incurred significant mortalities from the virus in the past, particularly during the late 1980s when >18,000 individuals died (IUCN, 2007a, 2007b). Less severe outbreaks have also occurred prior to and since the 1980s. Historically there have been population reduction programmes of both species to limit the impact they have on commercial fishers from net damage to depredation of fish caught in nets, traps or on lines. The licenced killing of individual seals causing damage to fishing gear and catches is still licenced today in many countries (IUCN, 2007b, 2007c).

With regards to the fishery under assessment, impacts on both porpoise and seals are non-existent. Both seals and porpoise can sometimes be seen swimming near the mussel farms (possibly attracted to fish that hide between the long-lines), and seals can often be found resting on the buoys (see **Figure 9**). There are no reported incidents of entanglement in the fishing gear.



Figure 9. Common seal resting on buoy in mussel farm (source: Scanfjord)

3.4.2.2 Eider ducks

Although e.g. oystercatchers and gulls also eat shellfish, they do not predate on the rope grown mussels. Eider ducks (*Somateria mollissima*) are therefore the only birds interacting with the mussel farms. There are no indications that other birds are disturbed or impacted by the fishery (personal comment Mr. Uddén, Ornithologist with Bohusläns Museum, and involved with eider duck studies through University of Gothenburg).

The eider ducks can dive to great depths to reach this food source. Blue mussels are the staple food for eider ducks and hence the large quantities of blue mussels that appear in a mussel farm attract these birds, often in large numbers. Eider ducks feeding on the mussels pose a large threat to the productivity of the farm and are therefore seen as nuisances by the mussel farmers.

Defining ETP as 'threatened species' means the eider duck does fall under this definition, given that it has been classified as VU in 2015. The species was assessed as NT in 2010, but the rapidly decreasing population in recent times has led it to now be red-listed as VU. Estimates from 2012 indicate there were around 150,000 breeding pairs in Sweden, but this is a sharp decline from 360,000 pairs in 2010. The decrease is thought to be a result of the reduction in quality of the habitat for the species and the number of reproductive individuals (including degraded reproduction). In Denmark and Germany, the decline of the nesting population is not as pronounced (Artdatabanken, 2015).

The eider duck had a very favourable population trend in Sweden during the period 1975-1995 when the stock more than doubled. The most likely reason for this favourable trend at the time was the high level of nutrients (and eutrophication) along the coast, especially in the Baltic region, which led to an increase in biomass of blue mussels. Since 1995, the number of eider ducks has declined back to the level it was at in the 1970s. However, this might well represent the normal population level in Sweden (personal comment Mr. Uddén). The extensive stock decline that started in the mid-1990s is probably caused by several factors. Both in Finland and Sweden there is strong evidence that predation from the growing population of mink leads to increased mortality in females and impaired breeding results by predation. The predation leads to a skewed gender quota with adverse effects on rejuvenation. A deterioration in the condition of the birds due to reduced availability and / or deterioration of the quality of the mussels (possibly caused by elevated water temperature in the winter) has also been presented as a hypothesis on the decline in numbers. During the late 1980s and mid-1990s there was also an outbreak of a virus (*pastorella*) on a few Swedish islands, which mainly lead to a decrease in females eider ducks. It is currently unclear how large a proportion of sexually mature females breed annually, but this can be a factor to consider for understanding the development of the population (Artdatabanken, 2015; personal comment Mr. Uddén).

The eider duck is included in Annex II, part B of the Birds Directive (Directive 2009/147/EC). The following is stated for species included in Annex II in the Birds Directive: "*Owing to their population level, geographical distribution and reproductive rate throughout the community, the species listed in Annex II may be hunted under national legislation. Member States shall ensure that the hunting of these species does not jeopardise conservation efforts in their distribution area.*" And for birds listed in Annex II part B the following is stated: "*The species referred to in Annex II, Part B may be hunted only in the Member States in respect of which they are indicated.*" (EC, 2009a). This means that according to the Birds Directive hunting on this species is not banned in the European Union. This indicates that the species is not considered critically endangered on European level.

Technically, the eider duck is included in the Swedish Species Protection Ordinance. However, due to its status under the Birds Directive, the species is also considered 'wild', which means that it is protected but may be hunted under the Swedish Hunting Regulation or the Hunting Act. Currently, there are no regulations on the active protection of eider ducks in Sweden. Although farmers are still able to apply for a license to shoot eider ducks as a form of deterrent through the County

Administrative Board, they haven't done so in recent years, and look at non-lethal ways of deterring the birds, like putting nets around the farm, and chasing the birds away with speed boats. Scanfjord is currently conducting tests in relation to eider duck deterrence, but no results have been published as yet. These tests are being carried out in cooperation with the University of Gothenburg.

The University of Gothenburg is involved in the BONUS-Optimus project (an EU-program with focus on the Baltic Sea), in which all Baltic countries are involved. Within BONUS-Optimus, there is a project together with German, Polish, Swedish and Danish partners, to look at growing conditions for blue mussels and mussel growth to combat eutrophication, and mitigation of benthic effects. One work-package is growth and optimisation, with Eider duck predation as part of that project (albeit a small aspect). Given the large interest from the industry in the results, the University has combined BONUS-Optimus funding and money from the Swedish agriculture board to look at the Eider duck problem in more detail. The eider duck study takes place in cooperation with Mr. Jan Uddén, Ornithologist with Bohusläns Museum and SLU.

The studies is ongoing until May 2019, and looks at dynamics between eider ducks and mussels: What is the importance of the mussels for the birds, how has the problem for the mussel farmers developed over the years?

Data from the farms on eider duck encounters (eider reports), combined with population data (annual monitoring data) is used to look at changes in the bird population. Included in the study are ways to deter the birds in an ethical way, with nets covering the farms currently as the best solution. The study compares farms with and without nets. There are only preliminary results so far, but the use of nets looks promising: farms that are protected yield more mussels. A follow-up question was whether the nets prohibit mussel growth due to decreased water movement around the farm. This doesn't seem to be the case, but there is no conclusive data as yet (personal comment Mats Lindegarth, University Gothenburg).

The nets cover the buoys and extend to around 5 meters deep. However, eider ducks seem to learn to dive below 5 m, so not all predation is mitigated in this way. There are no recent reports of entanglement of eiders (or other species) in the farms. During the first experiments with the nets over and around the farms, a few birds got caught in the nets: the 50 mm and 40 mm meshsize caused some Eider ducks to get entangled and drown, but the farmers are now using 30 mm mesh size for the net, where there has not been any observable catches or entanglement of any birds (observations from Univ. Gothenburg).

Another issue is that the nets are hard to handle, which makes checking of the mussels and harvesting a little more difficult. Preliminary results show that it should suffice to only use the nets until the mussels are around 10 months old. After this period, predation decreases as the mussels become too large for the birds to handle. Nets should be cleaned and de-fouled during these months, otherwise there might be a problem with water and nutrient flow. Even though the usage of the nets is more cumbersome, and cause some additional expenses to the mussel farmer, it is still considered worthwhile. Using the nets also mitigates the drop-off of mussels from the ropes caused by the birds, which lessens potential impact on the habitat underneath the farms (personal comment Mats Lindegarth, University Gothenburg).

Finally, the study investigates the behaviour of the birds in relation to normal deterrents (chasing them away with speed boats) versus the nets. Surveillance cameras on the farms are used to detect large

groups of birds near the farms and are also used to observe their behaviour. The birds are exhibiting learned behaviour: when farms are covered during the day, the birds come to feed during the night.

The information gathered during the study will be used to tailor the approach to mitigate against eider ducks preying on the farm grown mussels.

In at least the last 5 years, no licences were issued to mussel farmers for shooting eider ducks (personal comment Mr. Larsson from the Västra Götaland County Administrative Board).

As part of a condition on PI2.3.3. during the initial assessment, an eider control guide has been produced by the SSPO. It includes the following procedures:

- SSPO-farmers shall monitor all eider-ducks or similar birds which are present at the farm. They should be recorded in a journal at every visit of every active site. They should also be separated into male and female.
- The journal shall be kept for three years after it has been written.
- For every site it shall also be specified the type of equipment, if any, for eventual disturbance of the eider duck.
- If any birds are shot this shall be recorded in the journal.
- The journal shall once a year (at Year end) be sent to SSPO for data compilation of the information.

Even though Scanfjord will no longer be part of the SSPO, the farmer has the intention to keep collecting information via this reporting system and make the data available to Vattenbrukscentrum Väst (part of the Gothenburg University). Although the data has not been fully analysed, it will be used in the future to study trends in eider ducks around the mussel farms. The eider reports are part of the study into the effectiveness of deterrent measures as described above and provide a dataset from for comparison before and after the implementation of any new deterrent measures.

Mussel farms are not thought to pose a risk to the development of a stable population size of eider ducks. The farms might even contribute to the abundance of the species by providing a food source and increasing the natural occurrence of blue mussels by spreading larvae which might increase the natural abundance in the area. Even if farmers were to apply for a license to shoot eider ducks, they are only allowed to shoot a few birds (approximately 10) per year, while the eider ducks appear around the farms a few hundred birds at a time. The small number of birds shot would not affect the population size of eider ducks on the Swedish west coast (personal comment Mr. Larsson from the Västra Götaland County Administrative Board).

3.4.2.3 Tunicates

Other animals that are known to occur on mussel farms are sea squirts (tunicates) and starfish. Sea squirts settle on the farms and are a nuisance to the farmers since they use space that mussels could settle on instead, or even smother the mussels. Starfish prey on the mussels and are therefore also disliked by the farmers. Starfish predation is avoided by using ropes short enough to avoid seafloor contact. There are no known occurrences of interaction between threatened starfish species and mussel farms, only interactions with the common starfish (*Asterias rubens*), which is not a threatened species.

There are a few species of tunicates considered vulnerable or endangered on the Swedish Redlist, see Table 4.

Table 4. Tunicates on the Swedish Red List (source: Artdatabanken, 2015)

Latin name	Red list category
<i>Cnemidocarpa mollispina</i>	Vulnerable (VU)
<i>Cnemidocarpa devia</i>	Vulnerable (VU)
<i>Ascidia prunum</i>	Vulnerable (VU)
<i>Pelonaia corrugate</i>	Vulnerable (VU)
<i>Polycarpa fibrosa</i>	Endangered (EN)
<i>Styela atlantica</i>	Endangered (EN)

According to the Artdatabanken (2015), and <http://artfakta.artdatabanken.se> *Cnemidocarpa mollispina* had been numerous in the 1960's in the Öresund area in Sweden (not close to the mussel farms under assessment) but is now scarcely seen. It lives in 27-40 m depth and would therefore not exist in the same areas as the mussel farms. Even if farms were established in the area. *Cnemidocarpa devia* is only known from Kosterrännan in Bohuslän. These findings near the Koster islands are the only ones in the world. Since the species is only found below 80 m deep, there is no likely interaction with the mussel farms. *Ascidia prunum* only exists on deep rocky bottoms and has only been spotted twice in the Koster area in Sweden and is hence is not likely interacting with mussel farms. *Pelonaia corrugate* (sand finger) is found in Kattegatt and Skagerrak and north along the coast of Norway to Svalbard and Jan Mayen. During a Marine Inventory in 2006-2009, the species was only found on the Lilla Middelgrund fish farm in Kattegatt. In addition, there are recently documented reports from the Koster area. However, the species usually lives at 30-50 m depth, making interaction with the mussel farms highly unlikely. *Polycarpa fibrosa* can be found in Swedish waters along the whole west coast, from Öresund to Bohuslän. However, this species also lives in deeper areas, around 20-40 m and would therefore not interact with the mussel farms. *Styela atlantica* has been found in the Kosterfjord and Skagerrak between 100 and 750 m deep, making interaction with mussel farms unlikely.

However, the Swedish Red List currently has no juridical status and is only used as a tool in many different contexts, for example nature conservation planning and decision making when authorities assess which species need protection through e.g. protection by law (Artdatabanken.se). As far as we can determine, the tunicates listed are not protected by law and do not qualify as ETP species according to MSC criteria.

3.4.3 Habitat

The MSC Principles and Criteria require that fisheries do not cause serious or irreversible harm to habitat structure and function. When assessing the status of habitats and the impacts of fishing, teams are required to consider the full area managed by the local, regional, national, or international governance body(s) responsible for fisheries management in the area(s) where the UoA operates (the "managed area" for short) (SA3.13.5, MSC FCRv2.0). The MSC also specifies that the team shall use all available information (e.g. bioregional information) to determine the range and distribution of the habitat under consideration, and whether this distribution is entirely within the 'managed area' or extends beyond the 'managed area' (SA3.13.5.1, MSC FCRv2.0).

The MSC FCRv2.0 requires habitats interacting with the fishery to be defined as 'commonly-encountered', 'minor, or as 'vulnerable marine ecosystems (VME)', as shown in Table 5.

Commonly encountered and VME habitats are treated as ‘main’ habitats, in that they are scored at SG60 and SG80, whereas minor habitats are scored at SG100 only. More information is provided in the following sections of the report.

Table 5. Habitat definitions as per the MSC Fisheries Certification Requirements v2.0.

Habitat type (FCR reference)	Definition
Commonly encountered (SA3.13.3.1)	A commonly encountered habitat shall be defined as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat’s range within the management area(s) covered by the governance body(s) relevant to the UoA.
Minor (SA3.13.3)	All other habitats
Vulnerable marine ecosystem (VME) (GSA3.13.3.2)	<p>A VME shall be defined as is done in paragraph 42 subparagraphs (i)-(v) of the FAO Guidelines. This definition shall be applied both inside and outside EEZs and irrespective of depth. VMEs have one or more of the following characteristics, as defined in paragraph 42 of the FAO Guidelines:</p> <ul style="list-style-type: none"> • Uniqueness or rarity – an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems • Functional significance of the habitat – discrete areas or habitats that are necessary for survival, function, spawning/reproduction, or recovery of fish stocks; for particular life-history stages (e.g., nursery grounds, rearing areas); or for ETP species • Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities • Life-history traits of component species that make recovery difficult – ecosystems that are characterised by populations or assemblages of species that are slow growing, are slow maturing, have low or unpredictable recruitment, and/or are long lived • Structural complexity – an ecosystem that is characterised by complex physical structures created by significant concentrations of biotic and abiotic features

3.4.3.1 Commonly encountered and minor habitats

The assessment area (Skagerrak & Kattegat) is a biologically diverse area, forming an ecological link between the more saline waters of the North Sea and the more brackish waters of the Baltic. The Kattegat is shallow with depths never exceeding 100 m (mean depth <50 m) whilst the Skagerrak can exceed 700 m in the Norwegian Trench. Several vulnerable habitat species are known to occur in the area, such as *Lophelia pertusa* and species of seapens. Although there are some protected areas, there are also some areas where good habitat status exists, where mussel production would have little impact.

The MSC defines ‘habitat’ as ‘the chemical and bio-physical environment, including biogenic structures, where fishing takes place’ (Table GSA2, MSC FCRv2.0). For assessment purposes, the MSC requires that benthic habitats are described according to the following criteria (SA3.13.2 and Table GSA6, MSC FCR v2.0):

- characterising substratum - i.e. fine (mud, sand), medium, large or solid reef of biogenic origin;
- geomorphology - i.e. flat, low relief, outcrop or high relief; and
- biota (i.e., large erect, small erect/encrusting/burrowing, no fauna or flora, or flora)

In this regard, broad-scale sediment types and habitat maps for the region indicate that the seabed is predominantly a mix of sands and muds, the muddier fractions often located in deeper areas, except for the muddy areas within the fjords. Coarse sediments occur in isolated patches. Since most of the mussel farms are located in more sheltered areas, these occur near rock and potentially biogenic reefs (see Figure 10 below).

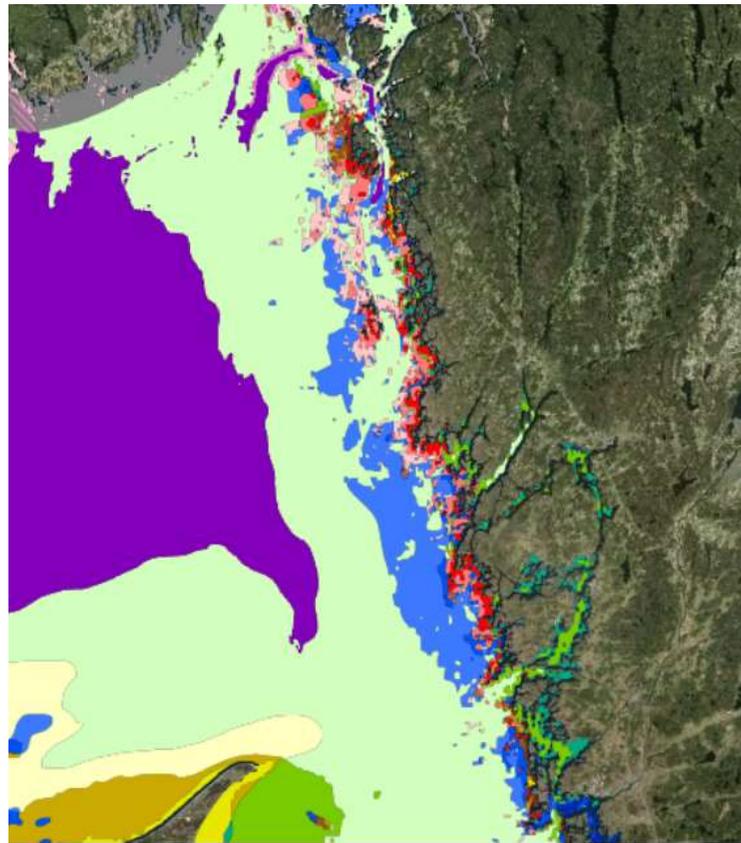


Figure 10. Map showing Marine Strategy Framework Directive (MSFD) benthic broad habitat types within the Skagerrak/Kattegat (left). Source: <http://www.emodnet-seabedhabitats.eu>, with map of distribution of mussel farms (right) for reference

Further to mapping done by OSPAR, and mapping undertaken in light of the MSFD, the Geological Survey of Sweden (SGU) has conducted mapping of Swedish sea benthic geological composition and structure since the late 1960s. The SGU has developed superficial substrate maps from available marine geological information in Swedish sea areas (see Figure 11). The maps show eight different classes of substrates, which are based on the EUNIS-classification scheme (European University Information Systems Organization). Substrate maps will continuously be produced in areas SGU surveys in the future. The marine geological maps show the original deposited material and reflect past and present hydrodynamic processes such as bottom currents, wave exposure, sediment-erosion, transportation and deposition as well as bathymetry. The purpose of this mapping is to produce information that is needed as a basis for social planning and decisions on use and protection of marine areas (Hallberg *et al.*, , 2010).

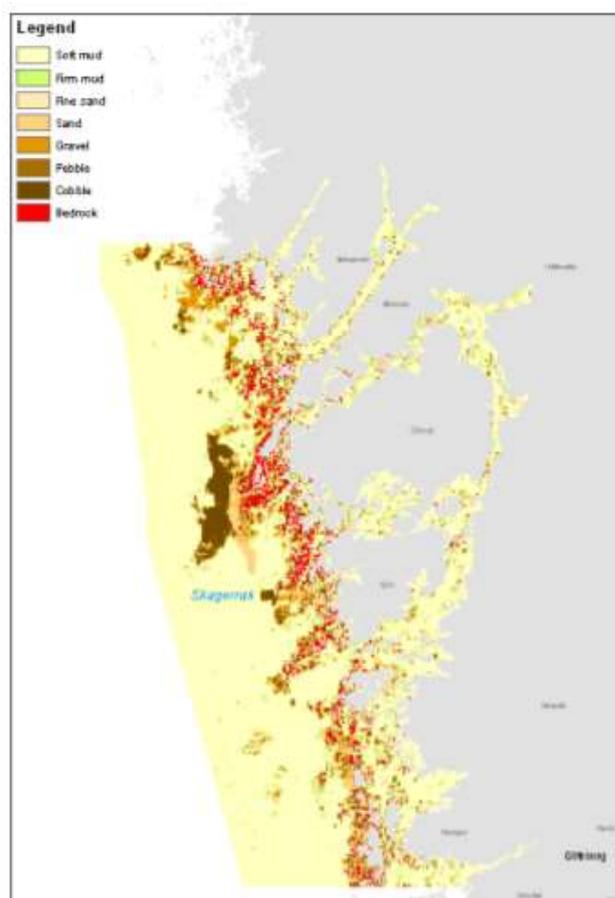


Figure 11. Bottom substrates on the Swedish west coast north of Gothenburg (source: Figure 7 in Hallberg et al, 2010)

The type of habitat that the mussel farms operate in is typically soft mud, as this is the most commonly occurring bottom substrate type overall of the Swedish west coast, and also around Orust, as shown in Hallberg et al (2010). Light yellow shows this bottom substrate type in Figure 11. This is also the most common has been taken to be the ‘commonly encountered habitat’ with regards to the mussel farms. Some units may have rocky bottom under or near the farm, defined as ‘bedrock’, marked with red. This constitutes ‘minor habitats’ for this fishery.

Substrate maps with high enough resolution to define what specific type of bottom substrate is present under a specific farm is not available at present, and therefore this information is to be gathered during all new mussel farming permits assessments, as this information is important when assessing the potential impact of a proposed farm on the habitat (see Section 3.4.3.3).

3.4.3.2 Vulnerable Marine Ecosystems (VMEs)

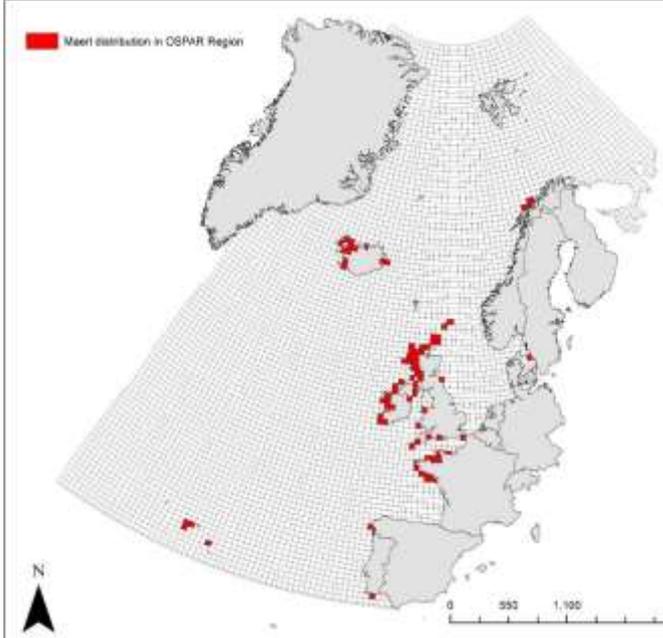
VMEs are defined according to FAO guidelines (see Table 5), with example groups including certain cold-water corals, some types of sponge-dominated communities, communities composed of dense emergent fauna forming an important structural component, and seep and vent communities comprised of endemic species.

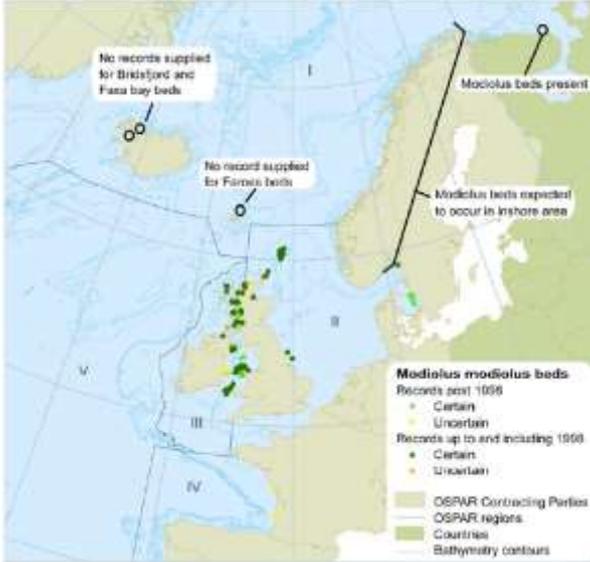
The VME concept was derived from concern over fishing impacts in deep sea areas beyond national jurisdiction, but the MSC requires that the VME definition be applied inside and outside Exclusive Economic Zones (EEZs) and irrespective of depth (SA3.13.3.2).

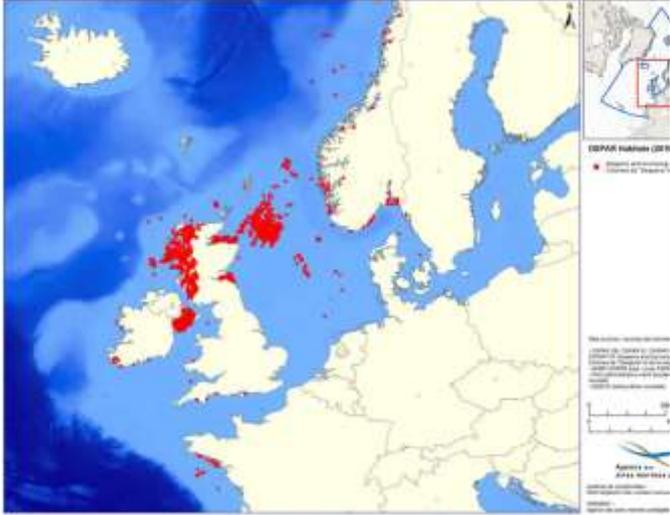
There is no definitive list of VME habitats within EU coastal waters, but in the generally much shallower waters of the Greater North Sea the OSPAR list of threatened and/or declining habitats (<https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>), together with additional habitats identified in the Helsinki Commission (HELCOM) red list of Baltic Sea underwater biotopes, habitats and habitat complexes (HELCOM, 2013a) allows for consideration of impacts to VME or VME-like indicator species and habitats.

Table 6. List of OSPAR threatened and/or declining subtidal habitats occurring in Region II (Greater North Sea, for this purpose limited to Skagerrak/Kattegat), and habitats included on the HELCOM Red List that are additional to those on the OSPAR list of threatened and declining habitats and occur in the Kattegat with summary information on distribution and risk posed by the fisheries under assessment.

Habitat	Present in Skagerrak/Kattegat?	Risk of impact
<i>Lophelia pertusa</i> reefs	<i>Lophelia pertusa</i> reefs are found mainly in depths of 200 – 2000 m, although they have been found at shallower depths in the Kattegat off the Swedish west coast. <i>Lophelia</i> reefs are reported from the Bratten SAC.	Very low, since <i>Lophelia</i> reefs occur further off-shore than the mussel farms
Maërl beds	Maërl is a collective term for unattached calcified algae that can form extensive beds, most often in coarse, clean sediments of gravels and sands. Maërl requires light for photosynthesis and is very uncommon in the Greater North Sea. Maërl is absent off Belgium, the Netherlands, Germany and Sweden according to OSPAR, although the OSPAR and HELCOM data do show some maërl habitat in the Skagerrak and / or Kattegat (OSPAR https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats , HELCOM –	Low, since maërl beds are very rare in the Swedish coastal area, and as shown by Figure 11, gravel and sand substrates occur mostly outside of the fjord-areas where the mussel farms are located.

Habitat	Present in Skagerrak/Kattegat?	Risk of impact
	<p>http://maps.helcom.fi/website/mapservice/index.html).</p>  <p>Figure 12. Maerl distribution in the OSPAR region</p> <p>Where maerl is present, the habitat occurs close inshore, in depths <40 m (Hall-Spencer et al, 2010)</p>	
<p><i>Modiolus modiolus</i> beds</p>	<p><i>Modiolus modiolus</i> is a widespread and common species in the Greater North Sea, but horse mussel beds (≥ 30 % coverage) as a VME are very limited in their distribution. Beds may be found in some locations in the Skagerrak / Kattegat region and in channels between Danish islands at the entrance to the Baltic.</p>	<p>Low, since the <i>Modiolus</i> beds in the Swedish coastal area occur further south in Skagerrak/Kattegat from where the mussel farms are located (as shown in Figure 13)</p>

Habitat	Present in Skagerrak/Kattegat?	Risk of impact
	 <p>Figure 13. Distribution of <i>M.modiolus</i> beds in the OSPAR area</p> <p>The aggregations of <i>M.modiolus</i> which form beds typically occur at depths from the lower shore (Davenport & Kjorsvik, 1982 in Rees, 2009) to about 70 m (although they have been found at greater depth). <i>Modiolus</i> beds occur on a range of substrata, most often on cobbles through to muddy gravels of glacial or glaciomarine origin, but have also been found on bedrock (Rees 2009).</p>	
<i>Ostrea edulis</i> beds	<p><i>Ostrea edulis</i> beds were once common and widespread in the North Sea, but fishing, pollution, disease and non-native species impacts, as well as several very cold winters in the 1930s and 1940s, mean that the species has been scarce since the 1950s. Oyster beds are defined as such when oysters occur at densities >5 m². Typically, they may occur to depths of 10 m, sometimes to 30 m. Small populations remain in sheltered, inshore locations (Haelters & Kerckhof, 2009).</p>	<p>Very low. Although flat oysters still occur in the Swedish coastal area, no large bed exist in the areas where mussel farming takes place. Furthermore, <i>Ostrea edulis</i> is slowly being replaced with <i>Crassostrea gigas</i>, the Pacific oyster, making the possible overlap between mussel farms and flat oyster beds even less likely.</p>
Sea-pen and burrowing megafauna communities	<p>Sea-pen and burrowing megafauna communities occur in plains of fine mud, at depths from 15-200 m or more, including extensively in the northern North Sea in the Fladen</p>	<p>Low. Sea-pen and burrowing megafauna communities in the Swedish coastal area occur further north in Skagerrak/Kattegat from</p>

Habitat	Present in Skagerrak/Kattegat?	Risk of impact
	<p>Ground to the northeast of Aberdeen, and in other isolated locations in the central North Sea.</p>  <p>Figure 14. Preliminary distribution of sea-pen and burrowing megafauna communities in the OSPAR maritime area</p> <p>Typical species include the sea-pens <i>Virgularia mirabilis</i> and <i>Pennatula phosphorea</i>, and burrowing crustaceans, including <i>Nephrops norvegicus</i>. Burrows and mounds form a prominent feature of the sediment structure, allowing oxygen to penetrate deeper into the sediment (Hughes et al, 2010).</p>	<p>the main areas with mussel farms are located, or further offshore outside the influence of the mussel farms (as shown in Figure 14)</p>
Gas (or bubble) reefs	<p>Gas or bubble reefs are complex structures, consisting of rocks, pavements and pillars up to 4 m high. The formations are due to the aggregation of sandstone by a carbonate cement resulting from microbial oxidation of, mainly, methane. The formations are interspersed with gas vents that may intermittently release gas.</p>	<p>Low. These reefs occur very sparse in the North Sea area. The one known gas reef in the Swedish EEZ lays in the Bratten SAC, in the northern Skagerrak. There is no overlap of mussel farms with this habitat type.</p>
Deep-sea sponge aggregations	<p>Across the areas within this assessment, records of deep-sea sponge aggregations exist only within the Bratten SAC and the Väderöfjorden and Kosterhavets National Park and in the Skagerrak.</p>	<p>Low The areas where the deep-sea sponge aggregations occur, have been designated as National Park, with restrictions for fisheries.</p>

Habitat	Present in Skagerrak/Kattegat?	Risk of impact
Haploops communities	<i>Haploops tenuis</i> and <i>Haploops tubicola</i> are small amphipods (crustaceans) living in tubes of mud and clay that are a few centimetres high in bottom sediments. Although not listed on the OSPAR threatened habitat list they are classified under HELCOM as 'endangered' and recognised from the Kattegat, usually at depths below 20-25 m (HELCOM 2013b)	Very low, since <i>Haploops</i> communities occur in deeper areas than the mussel farms

Based on the habitat maps, such as shown in Figure 10, and Figure 11, and habitat characteristics, several protected areas have been designated in the Swedish EEZ and coastal area. This ranges from areas protected under the Birds and Habitats Directives (Directive 2009/147/EC and Council Directive 92/43/EEC), the Natura 2000 sites, to National Parks and Nature Reserves. See e.g. Figure 15 for Marine Protected Areas (MPAs) in Sweden.

MPAs have been designated by all 12 OSPAR Contracting Parties (countries) bordering the North Sea to protect threatened and/or declining habitats within an ecologically coherent network of MPAs (OSPAR Commission 2017). Sites are designated under the national laws of individual Contracting Parties (including the EU Habitats Directive, transposed into national legislation), but are subsequently reported to OSPAR as contributing to the OSPAR network of ecologically coherent marine protected areas. Not all OSPAR MPAs include VME or potential VME, however, as some sites are identified for species (e.g. certain fish, bird or cetacean species), and some sites are designated for features including subtidal sandbanks, which do not meet the criteria for VMEs. Across the MPA network, different sites, and in some cases different areas within each site, are subject to differing levels of protection, depending on factors including the legislation under which the sites were designated, the conservation features of the sites, and the speed with which managers have introduced management measures, which in part is related to the levels of risk posed to the features.

With regards to Natura 2000, there are no overlapping areas between mussel farms and Natura 2000 sites, and thus no interaction with Natura 2000 habitats, like submerged sandbanks. However, these sites have mainly been mapped for deeper areas, and information is lacking on shallow near-shore habitats. The need for more benthic mapping in shallow areas is recognised, especially as a tool for marine spatial planning, and several parties are trying to get research funded (personal comment Mats Lindegarth, University Gothenburg).



Figure 15. OSPAR Marine Protected Area map (source: <http://carto.mpa.ospar.org/1/ospar.map>)

Several research initiatives have been started, most notably: The Bivalve project (started in January 2018), and Culture project (started in September 2017).

The Bivalve project aims to develop new knowledge for management of OSPAR-listed bivalve beds. It involves quantifying of the demographic development of the blue mussel and flat oyster populations over the next four years (also based on some historical data). The research will also be looking at changes in densities/coverage and in geographical distribution patterns. To evaluate the threats to these habitats the IVL Swedish Environmental Research Institute (IVL) will conduct a threat analysis. This will identify the major threats, which include for example dredging of the beds. Dredging is not allowed in the shallow areas and is not covered in this UoA.

The threat analysis will also identify potential knowledge gaps and try to fill some of these gaps (focusing mainly on interactions between the non-native Pacific oysters (*Crassostrea gigas*) and the two native species: blue mussels and flat oysters (*Ostrea edulis*)).

The culture project (Culture of Pacific oysters and evaluation of submerged culture systems) looks to answer the question: Can new species and new production techniques contribute to the diversification and expansion of the Swedish mariculture sector?

In this project IVL, together with shellfish farmers, will test and evaluate culture methods that can allow cultivation of the Pacific oysters in Swedish waters and facilitate expansion of the existing bivalve culture industry. More specifically they will:

- 1) Develop a model for evaluation of maturation of cultured Pacific oysters in relation to temperature, and test different techniques to prevent reproduction of the cultivated oysters,
- 2) Evaluate the biological culture potential of native bivalves (blue mussels and flat oysters) in submerged culture systems, and determine whether the technology can contribute to reduced fouling on the cultured organisms and equipment;

3) Create a knowledge platform regarding different types of submerged culture systems and highlight appropriate model systems based on Swedish conditions.

To facilitate management the IVL will also investigate population genetics and dispersal, using oceanographic trajectory modelling.

3.4.3.3 Impact assessment of rope grown mussels

The Aquaculture Plan for Västra Götaland states *inter alia* that one of the goals for Swedish aquaculture is that it is characterised by negligible environmental impact.

The responsibility of industry is to operate in a sustainable manner, economically, ecologically and socially. This involves working preventively and cultivating fish and shellfish in an ethical and environmentally friendly way.

This is reflected in the way the County Administrative Board issues licenses for mussel farms: spatial planning tools are used to limit impact on habitat, and farms are located in areas where negative environmental impact in terms of nutrient output is negligible. The production is adapted to the capacity of the ecosystem and takes into account other activities in the area. Swedish aquaculture makes a positive contribution to the environmental work by offering environmental services such as uptake of nitrogen and phosphorus (Länsstyrelsen i Västra Götalands Län, 2014).

Although the Scania mussel farms are the oldest on the Swedish West coast, the licenses from the County Administrative Board have to be renewed every 10 years, at which point new information with regards to impacts is taken into account.

Rope grown mussels do not touch the sea bottom. Some growth of organisms other than mussels may occur due to fouling (e.g. common starfish and barnacles). Some mussels may fall to the bottom and this might be an impact of the fishery on the sea floor. Major indirect impact of the farms might be the fact the mussels produce faeces and pseudo-faeces, with potential build-up of detritus underneath the farms. Therefore, smothering of habitat structure either by organic enrichment or shell debris needs to be considered. Literature reports indicate a variety of effects of shellfish farming activities on the benthic marine environment. Depositing of live mussels, broken shells, and other farm debris build up below the growing lines and, in the absence of strong currents, these deposits can increase sedimentation rates by reducing water flow across the seabed (FCI, 2014).

During the application process for a license from the County Administrative Board, the Board carries out an assessment of the area to which the license applies. In this assessment, the suitability of the habitat in relation to the mussel farm, and the presence of nearby nature conservation areas are considered. Several planning tools exist, like <http://skyddadnatur.naturvardsverket.se/> or <http://ext-webbgis.lansstyrelsen.se/Vastragotaland/Infokartan/> that give an overview of all protected areas. Although mussel farmers take these planning tools into account while selecting new areas for mussel farms, it is ultimately up to the County Administrative Board to assess the potential impact of the mussel farm on the area. The County Administrative Board also forwards all applications for further comments to the Maritime Administration, the Transport Board and the municipality.

Farms are established at sites with good water exchange, and not in the close vicinity of *Zostera*, i.e. eelgrass, beds. *Zostera* beds typically occur in areas with a smaller depth of 6 m, which is not in the usual depth range for placement of farms, since the long line system most commonly used on the Swedish west coast requires a depth of at least 7-8 m. Since mussels need good supply of plankton for fast growth, mussel farms are placed on locations with good water exchange, which makes the problems with organic build-up under the farm site less common.

The scale and intensity of the cultivation system in Sweden was regarded as 'low' at the initial assessment of the Swedish west coast fishery (for the SSPO), which included the farms in this assessment as well (FCI, 2014). The scale and intensity has not changed much since this initial assessment. Of the 100 permits given out by the County Administrative Board, around 55 permits are currently in use. Those 55 licenses range from 0.5 to 10 ha, with around 250 ha in total in use for mussel farms along the Swedish West coast, of which 227 ha is used by Scanfjord, and 1.5 ha by Västkustmusslor. Not all plots are used fully, and there is usual some rotation of the plots, creating fallow periods.

A study on the effects of mussel farming activity on the benthic nitrogen cycle, comparing 3 farming sites before and after (1.5 years) establishments of farms, found that there was an increase in sedimentation and benthic nitrogen flow at all three studied farms. The nitrogen deposits were shown to be recycled into the water column to a higher degree than on reference stations. When assessing the total nitrogen contribution from the farms, in relation to the removal via mussel harvesting it was established that there was a net uptake of nitrogen from the farms, as only 26 to 40 % of the amount corresponding to the harvested nitrogen was released to the water column by deposits from the mussels (Carlsson et al., 2012; in FCI, 2014).

Based on the above, mussel farming in Sweden is judged as low impact on the habitat and ecosystem.

Although the build-up of organic material underneath and near the farm is not likely to be a problem, due to the location of the farms and occasional fallow periods, studies on the effects of mussel farms with regards to organic enrichment are being carried out by the University of Gothenburg and IVL Swedish Environmental Research Institute. This research is building on studies done in the UK, and for now is only carried out in a laboratory setting. The aim of the research is to see if polychaetes can be used to clear the detritus (personal comment Ms Strand, from IVL). There is collaboration with DTU Aqua (the technical University of Denmark) to investigate the use of *Nereis spp* to see if they utilisemussel faeces to grow and can be used to 'clean up' underneath mussel farms. Furthermore, a project has been started to investigate the use of sea cucumbers to uptake organic matter, which may also have a commercial component (there is a market for sea cucumbers in China). The universities have not yet been able to do large scale studies in the field (personal comment Mats Lindegarth, University Gothenburg).

Within the BONUS-Optimus (describe in section 3.4.2.2) the research partners will also look at effects and possible structural changes due to mussels falling off the longlines. This might cause issues in deeper areas, where this may cause oxygen depletion (although currently mussel farms are located in more shallow areas). Within this project, they will also be studying the use of bioturbators like polychaetes such as *Nereis spp*. to decrease benthic impacts. They will be using different forms of video footage to see what is happening when clusters of shellfish build up on the seafloor in deeper areas. The information will be presented to policy makers, so that it can be considered for future planning of mussel farms. Furthermore, the University of Gothenburg has a student looking into

benthic effects, and especially how reversible these effects are (personal comment Mats Lindegarth, University Gothenburg).

3.4.4 Ecosystem

The distribution of the principle habitats is known, monitored and reported on in a general sense (section 3.4.3). The bird populations are regularly monitored and reported on, as described in section 3.4.2.1. for the eider duck. The bird monitoring program is more comprehensive and consists of annual monitoring and reporting on the Swedish coastal birds (Lunds Universitet, 2017). The decline in eider duck populations would not appear linked to mussel farming, as discussed in section 3.4.2.1.

The Water Framework Directive (WFD: EC, 2000) has been incorporated into the Swedish Environmental Code (Miljöbalk, 1998). The environmental code prescribes legislation for the discharges of waste water, other discharges and emissions or pollutants, noise, vibration, light, radiation etc. Because of the implementation of the WFD (and the EU Shellfish Directive, which has become part of the WFD), Sweden monitors the water quality, both with regards to ecological parameters (like primary production, seagrass occurrence, salinity, etc) and with regards to food quality (toxic algae and tracking of algal blooms).

With regards to ecosystem impacts, the main possible effect is a result of the filter feeding by the mussels. Removing food from the water means reduced food for other filtering organisms in the close vicinity. Phytoplankton depletion can occur in suspended mussel culture if the ecological carrying capacity of the body of water in which the farms are located is exceeded. Ecological carrying capacity can be defined as the stocking or farm density above which unacceptable ecological impacts begin to manifest. This happens when the removal of phytoplankton by all mussel farms in the water body outstrips the capacity of the ecosystem to replenish the supply, resulting in adverse conditions for the ecosystem functioning (FCI, 2014). Hence, the oceanography of the area where the farm is located together with the density of production determines that it is very unlikely that the capacity of the ecosystem is being reached or exceeded. It has been measured that one hectare of mussel farm requires between 15 - 25 hectares of primary production (Lindahl, O., 2007 in FCI, 2014) which gives a hint of how much mussel production can be sustained in a specific area. This number is calculated from a set level of primary production, and the number used is the long term mean for primary production between 1985 - 2006 ($230 \text{ gC/m}^2/\text{year}^1$).

The number of licenses provided by the County Administrative Board are based on a production model, which relies on the primary production as measured by Lindahl, 2007 (in FCI, 2014). Under the current system, there is room to grow the mussel production to 50,000 t. Currently, around 1,500 t mussels are harvested each year (of the approximately 13,000 t licensed). Since the production has not even reached the level for the total permits given, the current production volume is not regarded as a problem considering the carrying capacity of the ecosystem.

The carrying capacity of the mussel farming areas along the Swedish West Coast is not deemed to be a limiting factor or likely to be heavily impacted by the mussel farms. Both in Skagerrak/Kattegat and the Baltic, the levels of eutrophication are high. Mussel farming is seen as a way of reducing the level of eutrophication and improving the water quality (personal comments Ms Strand, Mr. Larsson).

There are recent reports that the wild blue mussel stock in Skagerak / Kattegat is declining (personal comment Ms Strand). IVL is currently conducting a study to see if this is also the case in Sweden. They are also looking into the possibilities of stock enhancement, e.g. in the form of mussel plots (bottom culture), to see if the wild stock would be influenced by these artificial mussel beds. Rope mussel

culture is currently not a part of the study but could be an additional source of mussels and mussel spat (personal comment Ms Strand, IVL).

The rope grown mussel culture offers an additional settling substrate to mussel larvae. This has potentially positive effects on the total number of mussel larvae that settle successfully. Compared to settlement on the bottom, the post settling mortality of these larvae is expected to be significantly smaller due to lower predation. It is very likely that suspended mussel culture therefore has a positive effect on the recruitment of the mussel stock. Since the mussels remain on the ropes for more than 1 year before they are harvested, the grow-out phase includes at least one spawning period. The suspended mussel culture therefore produces mussel larvae. The overall effect of rope grown mussels on the mussel stock is therefore expected to be positive rather than negative.

In summary, the situation in relation to Principle 2 has not changed since this fishery was initially assessed as part of the SSPO MSC certification – the fishery has little interaction with ETP species, only eider ducks (*Somateria mollissima*). The impact on habitats or the ecosystem remain negligible.

3.5 Principle Three: Management System Background

3.5.1 Jurisdiction

The fishery takes place in internal Swedish waters and hence completely under Swedish jurisdiction. The fishery is managed within the context of EU's Common Fisheries Policy (CFP), whose provisions are transposed into Swedish national legislation and supplemented by domestic regulation of the fishery.

3.5.2 Legal basis and management set-up

Sweden has a well-established system for fisheries management, which has evolved over decades and is now codified in the 1993 Fisheries Act (last revised 2016) and secondary legislation. The Act applies to fisheries within Swedish territorial waters, the Swedish EEZ and Swedish fisheries beyond the economic zone. It contains provisions on the right to fish (§§ 8 – 13), licensing (§§ 29 – 32), enforcement (§§ 33 – 36), penal sanctions (§§ 37 – 50) and administrative sanctions (§§ 51 – 60). Importantly, §§ 19 determines that the Government can issue regulations that ban or limit catch, the use of specific gear and fishing grounds. The main regulatory measures are specified in the 1994 Regulation on Fisheries, Aquaculture and the Fishing Industry (last revised 2016).

The executive power in Swedish fisheries management is the Swedish Agency for Marine and Water Management (SwAM – in Swedish: Havs- og vattenmyndigheten, HAV), located in Gothenburg and formally subordinate to the Ministry of Environment and Energy (in Swedish: Miljö- och energidepartementet). SwAM has a Department for Fisheries, which has sections for fisheries policy, licensing, landing control and a Fisheries Monitoring Centre (FMC). Fisheries science is conducted primarily by the Swedish University of Agricultural Sciences (in Swedish: Sveriges lantbruksuniversitet, SLU), through its Department of Aquatic Resources.

Management of mussel production in Sweden falls mainly under the purview of the National Board of Agriculture (in Swedish: Jordbruksverket), which is subordinate to the Ministry of Enterprise and Innovation (in Swedish: Näringsdepartementet), and the county administrative boards. Hence, the mussel industry is fundamentally subject to the fisheries legislation, cf. the aforementioned regulation which covers both fisheries and aquaculture, while specific rules are mostly set by the National Board of Agriculture and the County Administrative Boards. In addition to the Fisheries Act, the main legal basis for regulations is the 1998 Environmental Code (last revised 2018), which amalgamated 15 previous acts and replaced similar rules from different sectors with common rules across functional

fields. The Code is a major piece of legislation, containing 500 sections over nearly 100 pages. The County Administrative Boards issue production permits and enforce regulations. Also involved in the management of mussel production is the National Food Administration (in Swedish: Livsmedelverket) and the National Veterinary Institute (Statens veterinärmedicinska anstalt), both subordinate to the Ministry of Enterprise and Innovation, which monitor the quality of food production. The National Food Administration has the authority to open and close areas for production, and it also keeps track of production in the mussel industry. Scientific research is carried out by, e.g. the Swedish Environmental Research Institute (IVL – in Swedish: Svenska miljöinstitutet).

3.5.3 Objectives

The current CFP regulation requires that member states, in accordance with international treaties such as the 1982 Law of the Sea Convention, the 1993 FAO Compliance Agreement and the 1995 Fish Stocks Agreement, apply the precautionary approach to fisheries management. The precautionary principle is also listed as a central objective in other EU legislation and policy document of relevance for the fishery, such as the Marine Spatial Planning Directive, the Marine Strategy Directive and the Water Framework Directive. At national level in Sweden, the 1993 Fisheries Act and 1994 Regulation on Fisheries, Aquaculture and the Fishing Industry are sparse in terms of declared objectives but contained in practical regulatory measures are at least implicit clear long-term objectives that guide decision-making consistent with the MSC standard and the precautionary approach. In the management plans and other official documents, such as the 2002 National Strategy for Sustainable Development, such objectives are explicit, e.g. sustainable use, precaution and ecosystem considerations. In the Environmental Code, the precautionary principle is defined as the fundamental objective.

3.5.4 Stakeholders and consultation processes

Sweden has a long tradition of including non-governmental organizations in fisheries management, with continuous consultation and close cooperation between governmental agencies and user-group organizations – this is in line with the general ‘consensus culture’ in the country. Representatives of the various public authorities involved in the regulation of the mussel industry, the National Board of Agriculture, the National Food Administration and the County Administrative Boards, have regular discussions with individual mussel-producers and their organizations. Lines of communication are short, and much contact is spontaneous and happens in direct contact between industry representatives and the authorities. Among the more formal meeting places are the reference group for aquaculture (in Swedish: referensgruppen för vattenbruk) under the National Board of Agriculture, and the regional centres for aquaculture (in Swedish: vattenbrukscentra). Here stakeholders from a range of different sectors meet, including government, industry, science and NGOs. Furthermore, all governmental agencies at national level are required to have a Council for Public Access to Information (in Swedish: insynsråd) consisting of politicians and representatives of civil society, business and other state bodies of governance. Their aim is to ensure that the public receives necessary information on the working of the governmental institution. All changes in legislation in Sweden is subject to public hearings, which provides an addition layer of consultation.

3.5.5 Resolution of disputes

At national level in Sweden, there is an effective, transparent dispute resolution mechanism in place, as fishers can take their case to court if they do not accept the rationale behind an infringement

accusation by enforcement authorities or the fees levied against them. Verdicts at the lower court levels can be appealed to higher levels. The Environmental Code further establishes a system of environmental courts, which function as the first level of hearing for issues within the Code's sphere of authority. The general district courts function as regional environmental courts. The Superior Environmental Court is the Svea Court of Appeal, while the final court of appeal is the Supreme Court. The Environmental Code provides detailed provisions for how the courts shall function when they are set as environmental courts (Chapters 20–23). The working of the court system is fully transparent in Sweden, and the system is tested and proven to be effective in that court decisions are always implemented.

In the fishery under assessment, potential disputes are usually resolved through discussions at the county boards. These discussions are transparent and have proven to be effective as a dispute resolution mechanism appropriate to the context of the fishery.

3.5.6 Enforcement, sanctions and compliance

The EU system for fisheries control is laid out in the Control Regulation, which entered into force in 2010. The Regulation applies to all activities covered by the CFP carried out on the territory of member states or in EU waters, and by EU fishing vessels or nationals of a member state (Art. 2). It requires all member states to adopt appropriate measures, allocate adequate financial, human and technical resources and set up all administrative and technical structures necessary for ensuring control, inspection and enforcement of activities under the CFP (Art. 5). The Regulation contains Titles ('sections' above chapter level) on, among other things, access to waters and resources (Title III), control of fisheries (Title IV), control of marketing (Title V), surveillance (Title VI), inspections and proceedings (Title VII), enforcement (Title VIII) and common control programmes (Title IX). Procedures are established for situations where infringements are detected (Art. 82-88), including enhanced follow-up when infringements are serious (Art. 84). Further, provisions are given for proceedings (Art. 85-88) and sanctions (Art. 90-93).

The legal basis for enforcement of Swedish fishery regulations is found in the Fisheries Act §§ 33–36, according to which fishery inspectors ('fisketillsynsmän') can be appointed both under the national bodies of governance and the county administrative boards. A similar provision is found in Chapter 26 of the Environmental Code. As mentioned above, the National Food Administration has the authority to keep track of production in the mussel industry. Physical control is carried out by the county administrative boards, in the present fishery: the administrative board of Västra Götaland. The control focuses on the conditions that are tied to the licenses, e.g. that the farms are within the right positions, that they are marked correctly, have the right equipment that is consistent with the license, that they are farming the right species and that they are handled in a way so that they do not contribute to the spread of infections. Each farm is inspected every 2-3 years. In 2017, 64 sites were inspected out of 100 licensed areas.

In accordance with the EU Control Regulation, member States are required to ensure that appropriate measures are systematically taken when violations of fishing regulations are detected, including administrative action or criminal proceedings, to provide effective deterrence (Art. 89).

At national level in Sweden, the Fisheries Act provides detailed provisions of penal (§§ 37–50) and administrative (§§ 51–60) sanctions. The most important penal sanctions are fines, prison up to one year (up to two years for particularly serious infringements) and confiscation of catch, gear or vessel. Administrative sanctions include a 'sanction fee' in the range SEK 1,000–500,000. If the fishers do not

accept a sanction, they can take their case to court. The decision of a lower-level court can then be appealed to higher-level courts. The same applies to the environmental sphere, where Chapter 29 of the Environmental Code sets out the different penal actions available to authorities. a fine or a term of imprisonment not exceeding two years for environmental offence. If the offence is serious, the penalty shall be a term of imprisonment of not less than six months nor more than six years.

According to the Västra Götaland County Administrative Board, there have been no serious infringements of regulations in the UoA fishery since the control mechanism was introduced in 2014. This is stated in interview during the site visit (Mr. Larsson) and substantiated by a list of inspections and infringements presented to the assessment team. The high level of compliance is attributed to the high degree of responsibility that producers feel for the sustainable management of the resource. The user-group representatives interviewed at the site visit are of the same opinion, emphasizing that it is in everybody's interest that the production takes place according to regulations. Enforcement authorities also confirm that fishers provide information of importance to the effective management of the industry.

3.5.7 Review of the management system

All governmental agencies in Sweden, at both national and regional level, conduct annual internal reviews and must report to their respective ministry by 1 February the following year. If there are suspicions of irregular practice, a more thorough review is carried out.

There is a Strategy for Aquaculture Development 2012 - 2020 (Jordbruksverket, 2012), and an accompanying Action Plan (Jordbruksverket, 2014), to outline how to reach the goals stated in the strategy. For the last few years funding has been made available to implement the Action Plan, and subsidies are available for companies or stakeholder groups.

In 2018, a mid-way evaluation of the Action Plan for the development of Swedish aquaculture was completed, and this will also be reviewed at the end of the strategies' period (2020). The reviews are conducted on behalf of the Swedish Board of Agriculture (the Jordbruksverket).

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 (see Table 7). Harmonisation with The Netherlands and Limfjord rope grown mussel fisheries was considered, but not deemed necessary because the mussel stock, environment and management regime in the Swedish West Coast is distinct from the stock, environment, and management regime for these fisheries. There are no areas of P1, P2 or P3 of the MSC standard that require harmonisation for these fisheries.

However, since these fisheries have a similar production system, the available certification documents formed an important background resource for the assessment team - collating and reporting on available stock and fishery information, as well as highlighting areas of stakeholder and assessment team concerns.

The fishery under assessment will be part of the SSPO Swedish West Coast Rope Grown mussel fishery until mid-2019 and has been included as one of the main companies in the current re-assessment. This fishery has therefore been fully harmonised with the SSPO outcomes for P1, P2 and P3.

Table 7. Completed assessments for *Mytilus edulis* suspended cultivation

Fishery name	Status	PCR reference	MSC Requirements assessed under
Netherlands blue shell mussel fishery (suspended culture)	Certified -	MEC, 2016	v1.3 (version 2.0 process)
Limfjord blue shell mussel (rope grown)	Certified-	Acoura, 2016	v1.3 (version 2.0 process)
SSPO Swedish West Coast Rope Grown mussel fishery	Certified-	in re-assessment (PCDR: CU Pesca, 2018)	V2.0 (version 2.0 process)

4.2 Previous assessments

Although this full assessment is the initial full-assessment of the Scanfjord mussel fishery as a stand-alone fishery with regards to the MSC standard, the company was part of the SSPO Swedish Rope Grown Mussel Fishery when it was first certified on the 1st February 2014 by Food Certification International Ltd. (FCI). The certificate for this fishery was transferred from Acoura Marine to ME-Certification Ltd. (MEC; now Control Union Pesca (CUP)) on 26th February 2018. MEC carried out the fourth surveillance audit, together with the re-assessment site visit from 9th-11th April 2018, during which the Scanfjord farm was also visited.

4.3 Assessment Methodologies

This assessment was conducted in accordance with the MSC Fisheries Standard v2.0 and MSC Full Assessment Reporting Template: Enhanced bivalve fisheries 1.0. In terms of modifications to the Default Assessment Tree for enhanced bivalve fisheries, Principle 1 was removed (see section 3.3 for further explanation). The team evaluated that there was no evidence that the parent stock was negatively impacted, and so Principle 1 did not require scoring, as per SB2.1.4. For similar reasons, Genetic outcome PI 1.1.3 also didn't need to be scored (as SB2.1.5.2 is not satisfied SB2.1.5.2- 'Enhanced CAG bivalve fisheries that involve translocations shall also be scored against the Genetic outcome PI 1.1.3'). And finally, since this fishery is a Catch-and-Grow fishery based solely on spat collection (as opposed to dredging), without translocation, Primary and Secondary species components didn't have to be scored as per SB 3.1.1.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits

The site visit was held at the office of Scanfjord Mussels in Mollösund, Sweden, on the 9th October 2018. The individuals met during the site visit and their roles in the fishery are listed in Table 8. A few of the participants were contacted over Skype or phone for the re-assessment of the SSPO Swedish Rope Grown Mussel Fishery in April 2018. These participants have agreed to the use of their information for this assessment, and the dates of their initial interviews has been listed in Table 9.

Originally, the fishery was announced without 'other eligible fishers', after consultation with the client. During the site visit, the team learned that the client was in discussions with another farmer and would like to have the opportunity to allow this farmer (and potentially other farmers) to work under their certificate. Since all mussel farming companies on the Swedish West coast are currently covered by the SSPO certificate for Swedish West Coast Rope Grown Mussels (in re-assessment) operate and fishing in the similar area, the other companies would fall under the scope of this assessment.

The CAB therefore submitted a Variation Request to MSC to get permission to include 'other eligible fishers' in this assessment. This Variation Request was granted on 14th November 2018 and subsequently additional stakeholders with a potential interest in the Scanfjord Swedish Rope Grown Mussel fishery were notified of the change and invited to provide comments during a new 30-day consultation period.

Table 8. List of attendees at the on-site meetings.

Full name	Date	Location	Organisation
Anders Granhed	9 th October 2018	Mollösund	Mussel farmer and Client representative
Klas Holm	9 th October 2018	Mollösund	Mussel farmer and Client representative
Mats Lindegarth	9 th October 2018	Mollösund	University of Gothenburg
Kari Stange	9 th October 2018	Mollösund	MSC Sweden

Cora Seip	9 th October 2018	Mollösund	CU Pesca
Geir Hønneland	9 th October 2018	Mollösund	CU Pesca
<i>Fredrik Larsson</i>	<i>9th April 2018</i>	<i>Gothenburg (Skype)</i>	<i>Västra Götaland County</i>
<i>Jan Uddén</i>	<i>11th April 2018</i>	<i>Gothenburg (telephone)</i>	<i>Ornithologist with Bohusläns Museum</i>
<i>Åsa Strand</i>	<i>11th April 2018</i>	<i>Gothenburg (Skype)</i>	<i>IVL: Swedish Environmental Research Institute</i>
<i>Veronica Andrén</i>	<i>11th April 2018</i>	<i>Gothenburg (Skype)</i>	<i>Swedish Board of Agriculture</i>

4.4.2 Consultations

Apart from the stakeholders listed in Table 8, no other stakeholders contacted the team with comments. The information provided by the participants to the site visit has been incorporated in this report.

4.4.3 Evaluation Techniques

a) Media announcements

The fishery's assessment was announced on the MSC website on the 7th September 2018. 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 client representatives listed in Table 8 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.

c) Scoring

Scoring was agreed by the team via email correspondence. Consensus was reached for all scores. 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 rule for reaching the final recommendation: The decision rule for MSC certification is as follows:

- No PIs scores below 60;
- The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above.

The aggregate score for each Principle is the sum of the weighted score of each Performance Indicator within that Principle.

e) Scoring elements: The set of scoring elements considered in the assessment is listed in Table 9.

Table 9. Scoring elements

Component	Scoring elements	Main/Not main	Data-deficient or not
Target species/ stock	Skagerrak/Kattegat Blue Mussel (<i>Mytilus edulis</i>)	Target	N/a (P1 not scored)
Primary species	none	n/a	Since this fishery is a catch-and-grow fishery based solely on spat collection, Primary and Secondary species components do not have to be scored (SB 3.1.1.).
Secondary species	none	n/a	
ETP species	Eider ducks	n/a	No
Habitats	Subtidal, Swedish coastal area (West coast):		
	- Commonly encountered habitat (soft mud)	n/a	No
	- VMEs (see Section 3.4.3.2)	n/a	No
	- Minor habitats (hard substrate/ rocky bottom)	n/a	No
Ecosystem	Skagerrak/Kattegat: West coast Sweden	n/a	No

f) Use of the RBF

The RBF was not used for this re-assessment, based on the following rationale:

The team conclude that, in accordance with the Fisheries Certification Requirements SB2.1.4 – ‘*If an enhanced CAG bivalve fishery does not involve translocations, and there is no evidence that it negatively impacts the parent stock, teams may choose not to score Principle 1*’, Principle 1 does not need to be scored and consequently, RBF has not been used for PI 1.1.1.

Since this fishery is a Catch-and-Grow fishery based solely on spat collection (as opposed to dredging), Primary and Secondary species components don’t have to be scored (SB 3.1.1.).

There is sufficient information about the interaction of the fishery with ETP species. From the initial assessment, the SSPO has implemented the recording of ETP encounters through the Patrol Reports.

The information collected via this reporting system is transferred to Vattenbrukscentrum Väst (part of the Gothenburg University). The RBF is not needed to score 2.3.1.

Sufficient information is available to assess the impact of this fishery on habitat and ecosystem. E.g. geological marine maps are available, giving an overview of the habitats encountered by the UoA, and studies have been done to assess primary production, and the effects of organic depositions underneath and near mussel farms. The RBF is therefore also not needed for PI 2.4.1 and 2.5.1.

5 Traceability

5.1 Eligibility Date

The Eligibility Date has been set as the date of certification, **pending the successful outcome of this evaluation**. Product caught by Scanfjord Mollösund after the date of certification will be eligible to enter further chains of custody.

5.2 Traceability within the Fishery

Harvesting is done on board. There is no cleaning on board, everything is shipped in big bags to the packing facility at Mollösund. The majority is shipped to Scanfjord Mollösund by boat, where a facility for washing and packaging is located 100 m from shore. There are two landing sites: Mollösund, and Slussen. If the mussels are landed at Slussen, the big bags are put on a truck for transport. The truck is owned by Scanfjord. Ownership changes at point of landing, where they fall under the Chain of Custody certificate of the processor (in most cases Scanfjord itself, or processors in The Netherlands). The fish auction (Gothenburg) does not play an active role in the sale of mussels.

Mussels are mostly 'direct-sales'. Farmers harvest their stock, based on orders from wholesales or processing companies. During the harvest all mussels are placed in big bags. Every batch is marked with a code that matches with the registration documents. If a batch is transported, there is a standard document for transport, which includes the batch number. If a customer (processor, wholesaler) wants to be able to sell the mussels as MSC, they request to include the MSC certificate number on the registration documents (not all customers ask for MSC mussels specifically).

The National Food Administration (NFA; in Swedish: Livsmedelverket) and the National Veterinary Institute (Statens veterinärmedicinska anstalt) are involved in the management of mussel production., through monitoring of the quality of food production. The NFA is the authority responsible for the traceability in handling mussels in Sweden and has the authority to open and close areas for production (in relation to food safety, e.g. in relation to biotoxins), and it also keeps track of production in the mussel-industry. A landing form and a registration document for bivalve molluscs must be sent to the NFA. The mussel farmers further supply the processing companies with the necessary registration documents. The registration document is also sent to NFA, as well as kept by the farmer for at least 1 year. Information supplied in the document includes the location of harvest, i.e. longitude and latitude, amount landed, harvesting date etc. The team has reviewed these documents during the site visit.

The management system in place in the fishery implements a robust traceability of system. The prime reason for a detailed traceability system is due to the sanitary issues associated with the sale of shellfish for human consumption. The fishery needs to be able to trace back to the area of harvest in the eventuality of a bacteria or toxin outbreak in a consignment of mussels.

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/s to be used within the fishery	Not applicable, unless a new gear type is developed in future years.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	Not applicable. Each farmer has its own locations, and there is no farming/fishing outside those farm plots.

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 vessels outside of the UoC or client group fishing the same stock	Low risk: The mussel growers catch their own mussel spat for grow-out. Both Catch and Grow happen at specific sites, and there is no possibility of fishing the same stock after collecting the mussel spat.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	<p>Low risk: although Scanfjord will split off from the SPPO certificate, other mussel farmers in Sweden (currently members of SSPO) are also covered by a MSC certificate. All mussels are harvested from the ropes, straight onto the vessels. On-board, they are placed in open bags, but they are 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.</p> <p>The mussel growers catch their own mussel spat for grow-out. Both Catch and Grow happen at specific sites, and harvest takes place at each site separately. There is no storage of the harvested stock before landing, and transport only takes place from the area where mussels have been harvested to the point of landing.</p>
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	Not applicable: no processing occurs within this fishery or before subsequent Chain of Custody. The fishery only sells live, whole mussels, which are processed (cleaned, graded etc) further up the Chain of Custody. The 'batch-per-batch harvesting process' as described above enables the identification of specific production lines for all product entering factories. This enables MSC certified product to be distinguished at the start of chain of custody certification.
Risks of mixing between certified and non-certified catch during transshipment	Not applicable: there is no transshipment.
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	Not applicable: although Scanfjord will split off from the SPPO certificate, other mussel farmers in Sweden (currently members of SSPO) are also covered by a MSC certificate. There is no non-certified catch. All mussel farmers catch their own spat for grow-out. The fishery is carried out without translocations.

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 members of the

client group (listed in Section 3.2.1) grown-out on bands on the Swedish West Coast after the eligibility date, pending a successful MSC assessment by the CU Pesca assessment team.

Subsequent Chain of Custody certification is required at first change of ownership. 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 the processing plants.

Ownership changes at point of landing. The fishery currently lands at Mollösund, or Slussen. When there is no processing facility in connection to the landing location, the mussels are sent to the processing facility (owned by Scanfjord), or to facilities in the Netherlands, France, Denmark or Germany.

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

No IPI stocks were identified in this assessment.

6 Evaluation Results

6.1 Principle Level Scores

The final principal scores are provided in Table 10.

Table 10. Final Principle Scores

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	Not scored
Principle 2 – Ecosystem	84.4
Principle 3 – Management System	92.9

6.2 Summary of PI Level Scores

Principle	Component	Wt	Performance Indicator (PI)		Wt	Score
Two	Primary species					Not scored
	Secondary species					Not scored
	ETP species	0.2	2.3.1	Outcome	0.33	80
			2.3.2	Management strategy	0.33	80
			2.3.3	Information strategy	0.33	80
	Habitats	0.2	2.4.1	Outcome	0.33	85
			2.4.2	Management strategy	0.33	80
			2.4.3	Information	0.33	80
	Eco-system	0.2	2.5.1	Outcome	0.33	100
			2.5.2	Management	0.33	85
2.5.3			Information	0.33	90	
Three	Governance and policy	0.5	3.1.1	Legal &/or customary framework	0.33	100
			3.1.2	Consultation, roles & responsibilities	0.33	100
			3.1.3	Long term objectives	0.33	100
	Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	80
			3.2.2	Decision making processes	0.25	95
			3.2.3	Compliance & enforcement	0.25	95
			3.2.4	Monitoring & management performance evaluation	0.25	80

6.3 Summary of Conditions

No conditions were raised during this full assessment.

6.4 Recommendations

The assessment team did not make any recommendations.

6.5 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.

7. References

- Acoura Marine, 2016. MSC SUSTAINABLE FISHERIES CERTIFICATION Limfjord Blue Shell Mussel (Rope grown). Public Certification Report.
- Acoura Marine, 2017. MSC SUSTAINABLE FISHERIES CERTIFICATION Off-Site Surveillance Visit - Report for Swedish West Coast Rope Grown Mussel Fishery. 3rd surveillance report.
- ArtDatabanken 2015. Rödlistade arter i Sverige 2015. ArtDatabanken SLU, Uppsala (Swedish Redlist) Website accompanying Swedish Red List, with specific species information: <http://artfakta.artdatabanken.se>
- ASCOBANS, 2000. 3rd Session of the Meeting of Parties, Bristol, United Kingdom, 26 – 28 July 2000. Resolution No. 3 - Incidental Take of Small Cetaceans.
- Carlsson, M., Engström, P., Lindahl, O., Ljungqvist, L., Petersen, J K., Svanberg, L., Holmer, M. 2012. Effects of mussel farms on the benthic nitrogen cycle on the Swedish west coast. Aquaculture environment interactions Vol. 2: 177-191, 2012
- Christiansen, 2010 (updated 2011). Background Document for Sea-pen and Burrowing megafauna communities. OSPAR Commission
- CU Pesca, 2019a. Marine Stewardship Council (MSC) Public Certification Report SSPO Swedish West Coast Rope Grown Mussel Fishery On behalf of Swedish Shellfish Aquaculture Producer Organisation Prepared by Control Union Pesca Ltd
- CU Pesca, 2019b. Marine Stewardship Council (MSC) Public Comment Draft Report – Principle 2 Joint demersal fisheries in the North Sea and adjacent waters On behalf of The Danish Fishermen Producers Organisation (DFPO), The Swedish Fisherman's Producer Organisation (SFPO), The Erzeugergemeinschaft-nordsee (EZG) and Coöperatieve Visserij Organisatie (CVO) Prepared by Control Union Pesca Ltd
- Daguin, C., F. Bonhomme and P. Borsa, 2001. The zone of sympatry and hybridization of *Mytilus edulis* and *M. galloprovincialis*, as described by intron length polymorphism at locus mac-1. Heredity, volume 86 pp 342-354. <https://www.nature.com/articles/6888320>
- EC, 1992. Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
- EC, 2000. Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy
- EC, 2008. Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)
- EC, 2009a. Directive 2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2009 on the conservation of wild birds

- EC, 2009b. COUNCIL REGULATION (EC) No 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006.
- EC, 2013a. Regulation (EU) No. 1380/2013 of the European Parliament and of the Council on the Common Fisheries Policy, amending Council Regulations (EC) No. 1954/2003 and (EC) No. 1224/2009 and repealing Council Regulations (EC) No. 2371/2002 and (EC) No. 639/2004 and Council Decision 2004/585/EC.
- EC, 2013b. Regulation (EU) No. 1380/2013 of the European Parliament and of the Council on the Common Fisheries Policy, amending Council Regulations (EC) No. 1954/2003 and (EC) No. 1224/2009 and repealing Council Regulations (EC) No. 2371/2002 and (EC) No. 639/2004 and Council Decision 2004/585/EC.
- EC, 2014. DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 July 2014 establishing a framework for maritime spatial planning.
- EEA, 2008. The North Sea.
- Environmental Protection Agency website: www.naturvardsverket.se
- Fiskelag (1993:787) [Fisheries Act], Svensk författningssamling 1993:787 t.o.m. SFS 2016:824.
- FCI (Food Certification International Ltd), 2014. MSC SUSTAINABLE FISHERIES CERTIFICATION. SSPO Swedish West Coast Rope Grown Mussel Fishery. Public Certification Report.
- Förordning (1994:1716) om fisket, vattenbruket och fiskerinäringen [Regulation on on Fisheries, Aquaculture and the Fishing Industry], Svensk författningssamling 1994:1716, t.o.m. SFS 2016:826.
- Förvaltningsmål för nationellt förvaltade fiskbestånd [Management Objectives for Nationally Managed Fish Stocks], Aqua Reports 2016: 10.
- Garpe, K. 2008. Ecosystem services provided by the Baltic Sea and Skagerrak. Report 5873. Swedish environmental protection agency. <http://www.naturvardsverket.se/Documents/publikationer/978-91-620-5873-9.pdf>
- GENIMPACT project: https://cordis.europa.eu/result/rcn/47514_en.html
- Habitat map Vastra Gotaland: <http://ext-webbgis.lansstyrelsen.se/Vastragotaland/Infokartan/>
- Haelters & Kerckhof, 2009. Background Document for Ostrea edulis and Ostrea edulis beds. OSPAR Commission
- Hallberg, O. J. Nyberg, A. Elhammer & C. Erlandsson, 2010. Ytsubstratklassning av maringeologisk information SGU-rapport 2010:6
- Hall-Spencer, J.M, J. Kelly & C.A. Maggs ,2010. Background Document for Maërl beds. OSPAR Commission

- Halvtidsrapportering av handlingsplanen för utveckling av svenskt vattenbruk [Mid-way Reporting on the Plan of Action for the Development of Swedish Aquaculture], Swedish Aquaculture, 2018.
- Handlingsplan för utveckling av svenskt vattenbruk – konkretisering av Strategi 2012-2020 [Plan of Action for the Development of Swedish Aquaculture – Concretization of Strategy 2012-2020], National Board of Agriculture, 2015.
- Hanson, M. N. Thompson D. Duck C. Moss S. Lonergan, 2013. Pup Mortality in a Rapidly Declining Harbour Seal (*Phoca vitulina*) Population. PLoS One 8, 1–8.
- HELCOM, 2013a. SPECIES INFORMATION SHEET - *Phoca vitulina vitulina*. HELCOM Red List Marine Mammal Expert Group
- HELCOM 2013b. HELCOM Red List AB.H112, biotope information sheet
- Huntington, T.C., H. Roberts, N. Cousins, V. Pitta, N. Marchesi, A. Sanmamed, T. Hunter-Rowe, T. F. Fernandes, P. Tett, J. McCue and N. Brookie (2006). 'Some Aspects of the Environmental Impact of Aquaculture in Sensitive Areas'. Report to the DG Fish and Maritime Affairs of the European Commission.
- ICES, 2016. Greater North Sea Ecoregion – Ecosystem overview. ICES Ecosystem Overviews Greater North Sea Ecoregion, ICES Advice 2016, Book 6.
- ICES, 2010. EC request on cetacean bycatch Regulation 812/2004, Item 2. ICES, Special request Advice, May 2010.
- IUCN, 2007a. *Phocoena phocoena*. The IUCN Red List of Threatened Species 2007: e.T17027A6734714. Species account by IUCN SSC Cetacean Specialist Group; regional assessment by European Mammal Assessment team. IUCN.
- IUCN, 2007b. European Mammal Assessment team. *Halichoerus grypus*. The IUCN Red List of Threatened Species 2007: e.T9660A13006007. IUCN.
- IUCN, 2007c. European Mammal Assessment team. *Phoca vitulina*. The IUCN Red List of Threatened Species 2007: e.T17013A6723347. IUCN.
- Jordbruksverket, 2012. Swedish aquaculture– a green industry in blue fields. Strategy 2012–2020
- Jordbruksverket, 2014. Handlingsplan för utveckling av svenskt vattenbruk Konkretisering av Strategi 2012-2020 (action plan to make the strategy 2012-2020 concrete)
- Länsstyrelsen i Västra Götalands Län, 2014. VATTENBRUKSPLAN FÖR VÄSTRA GÖTALAND – Marina områden (County Board Västra Götaland Aquaculture Plan)
- Lunds Universitet, 2017. Nationell kustfågelövervakning 2017 (National Coastal bird monitoring)
- MEC, 2016. Marine Stewardship Council (MSC) Reduced Reassessment Public Certification Report Netherlands Blue Shell Mussel (Bottom and Suspended Culture) Fishery
- Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779.
- MSC, 2014. MSC Fisheries Certification Requirements and Guidance Version 2.0

OSPAR Commission 2017. Status of the OSPAR Network of Marine Protected Areas in 2017:
https://www.ospar.org/site/assets/files/1378/assessment_sheet_mpa_status_2017.pdf

OSPAR, habitat information: <https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats>

OSPAR mapping of MPAs: <http://carto.mpa.ospar.org/1/ospar.map>

Rees, 2009. Background Document for Modiolus modiolus beds. OSPAR Commission

SSPO Eider control guide

Sveriges officiella statistik, 2017.

Sweden's National Strategy for Sustainable Development 2002, Government Communication 2001/02:171.

Swedish Aquaculture 2012 – a Green Industry in Blue Fields, National Board of Agriculture ['Aquaculture Strategy']

Västra Götaland County Administrative Board, 2012. Vattenbruksplan för Västra Götaland – marina områden [Aquaculture Plan for Västra Götaland – Marine Areas].

<http://www.emodnet-seabedhabitats.eu>

<http://skyddadnatur.naturvardsverket.se/>

Appendices

Appendix 1 Scoring and Rationales

Principle 1 scoring rationales: Principle 1 not scored, see Section 3.3

Principle 2 scoring rationales

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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
		Minor primary species stock status		

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.		
b	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?			n/a
	Justification	Not scored as per SB 3.1.1.		
References		MSC, 2014: FCR, SB 3.1.1.		
OVERALL PERFORMANCE INDICATOR SCORE:				n/a
CONDITION NUMBER (if relevant):				-

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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
Management strategy implementation				

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.		
c	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?		n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
References		MSC, 2014: FCR, SB 3.1.1.		

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.	
OVERALL PERFORMANCE INDICATOR SCORE:		n/a
CONDITION NUMBER (if relevant):		-

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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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?			n/a
	Justification	Not scored as per SB 3.1.1.		
	Information adequacy for management strategy			

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		
c	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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
References		MSC, 2014: FCR, SB 3.1.1.		
OVERALL PERFORMANCE INDICATOR SCORE:				n/a
CONDITION NUMBER (if relevant):				-

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	<p>Main Secondary species are likely to be within biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are highly likely to be above biologically based limits</p> <p>OR</p> <p>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.</p> <p>AND</p> <p>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.</p>	<p>There is a high degree of certainty that main secondary species are within biologically based limits.</p>
	Met?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
		Minor secondary species stock status		

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.		
b	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/a
	Justification	Not scored as per SB 3.1.1.		
References		MSC, 2014: FRC, SB 3.1.1.		
OVERALL PERFORMANCE INDICATOR SCORE:				n/a
CONDITION NUMBER (if relevant):				-

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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
Management strategy implementation				

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.		
c	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?		n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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?	n/a	n/a	n/a
	Guidepost	Not scored as per SB 3.1.1.		
References		MSC, 2014: FCR, SB 3.1.1.		

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.
OVERALL PERFORMANCE INDICATOR SCORE:	n/a
CONDITION NUMBER (if relevant):	-

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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
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/a
	Justification	Not scored as per SB 3.1.1.		
	Information adequacy for management strategy			

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.		
c	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?	n/a	n/a	n/a
	Justification	Not scored as per SB 3.1.1.		
References		MSC, 2014: FCR, SB 3.1.1.		
				n/a
CONDITION NUMBER (if relevant):				-

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1		<p>The UoA meets national and international requirements for the protection of ETP species</p> <p>The UoA does not hinder recovery of ETP species</p>		
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	<p>In relation to the suspended mussel culture (rope grown mussels), the eider duck and some marine mammals (harbour porpoise, grey and common seal) fall under the definition of ETP-species (see Section 3.4.2). With reference to limits set on ETP species, the only ETP species for which specific limits exist in terms of total mortality permitted before a management response is required, is the harbour porpoise. There are no specific limits for the other ETP species that may be directly affected (i.e. mortality) by the fisheries. Therefore, as per the MSC Fisheries Standard v2.0 SA3.10.1.1, since there is “no applicable national legislation or binding international agreement” that set limits with respect to the remaining ETP species, scoring issue (a) shall only be scored for the harbour porpoise. Direct effects of the fisheries on all ETP species are scored in the following section, SI(b).</p> <p>For harbour porpoise, ASCOBANS has set limits on “unacceptable interactions” as being a total anthropogenic removal >1.7% of the best available population estimate. With regards to the fishery under assessment, impacts on harbour porpoise are non - existent. Porpoise can sometimes be seen swimming near the mussel farms (possibly attracted to fish that hide between the long-lines). There are no reported incidents of entanglement in the fishing gear.</p> <p>MSC Guidance (GSA3.10) states that the team should consider whether the ETP species overlaps with other MSC UoAs and whether there are limits set that pertain to these UoAs in either national legislation or binding international agreements. The limits set by the international agreement should be the ones that the combined impacts of MSC UoAs need to be within, regardless of whether they are within their own separate national limits. With regards to the fishery under assessment, impacts on harbour porpoise are non - existent. The same goes for</p>		

<p>PI 2.3.1</p>	<p>The UoA meets national and international requirements for the protection of ETP species</p> <p>The UoA does not hinder recovery of ETP species</p>
	<p>other mussel farms along the Swedish West coast (as described in the PCR for the SSPO Swedish West Coast Rope Grown mussel fishery by CU Pesca, 2019a).</p> <p>As for the impact of other MSC UoAs on harbour porpoise in the Greater North Sea area (North Sea, ICES Subarea 4, and Skagerrak, Kattegat, ICES subarea 3a), the team has looked at the PDCR for the ‘Joint demersal fisheries in the North Sea and adjacent waters’ assessment (CU Pesca, 2019b), since this is both the most recent analysis of the impact of other MSC UoAs on this species, and covers a large portion of the North Sea fisheries (and all MSC fisheries with a possible impact near the Swedish coastal are, which are set nets).</p> <p>CU Pesca (2019b) identifies set nets as the biggest risk to regional porpoise populations (based on ICES, 2016). Due to the acknowledged uncertainty over the estimated population impact it is not possible to state with a “high degree of certainty” that the set net fisheries are meeting international requirements for the protection of harbour porpoise in the North Sea. However, based on the best estimates of total mortality it appears “highly likely” that the fisheries are operating within the internationally agreed limits for harbour porpoise mortality. ICES states the percentage fishing mortality over the Greater North Sea Ecoregion is <1.7 % as a level stipulated by ASCOBANS as the maximum acceptable total mortality from all activities above which a management response would be required to limit the mortality to which the population is subjected. ICES acknowledges that some uncertainty surrounds its estimate due to unknown bias and a lack of reporting from some nations (ICES, 2016). However, the upper estimate of bycatch mortality was 0.88 % and even accounting for some potential bias the assessment team considers it highly unlikely that this estimate would increase by 100 % and exceed the 1.7 % limit (CU Pesca, 2019b).</p> <p>The fishery therefore meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species. SG 80 is met. However, no research has been identified to provide a high degree of certainty for the fishery under assessment, and due to the acknowledged uncertainty over the estimated population impact it is not possible to state with a “high degree of certainty” that the set net fisheries are meeting international requirements for the protection of harbour porpoise in the North Sea, so overall SG100 is not met.</p>
	<p>Direct effects</p>

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		
b	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	N
	Justification	<p>The known direct effects on eider duck by the UoA are being shot by mussel farmers as a deterrent, being chased away, and potential entanglement in the gear or nets. Based on the information detailed in Section 3.4.2.2, these direct effects do not hinder recovery. The decline in population numbers are thought to be mainly the result of predation by mink.</p> <p>Mussel farms are not thought to pose a risk to the development of a stable population size of eider ducks. The farms might even contribute to the abundance of the species by providing a food source, and increasing the natural occurrence of blue mussels by spreading larvae which might increase the natural abundance in the area.</p> <p>Although farmers are still able to apply for a license to shoot eider ducks as a form of deterrent through the County Administrative Board, they mostly look at non-lethal ways of deterring the birds, like putting nets around the farm, chasing the birds away. There are currently a few tests ongoing in relation to eider duck deterrence, but no results have been published yet. These tests are carried out in cooperation with the University of Gothenburg. So far, using nets around and over the farm (like in salmon farming) seems promising. In recent years, no licences were issued to mussel farmers for shooting eider ducks (personal comment Mr. Larsson from the Västra Götaland County Administrative Board).</p> <p>Even if farmers were to apply for a license to shoot eider ducks, they are only allowed to shoot a few birds (approximately 10) per year while the eider ducks appear around the farms a few hundred birds at a time. In case a hunting license was granted, the small number of birds shot is not considered to affect the population size of eider ducks on the Swedish west coast (personal comment Mr. Larsson from the Västra Götaland County Administrative Board).</p> <p>To further limited the effects on eider ducks, an eider control guide has been produced by the SSPO. The mussel farmers recorded the presence of eider ducks in a journal at every visit of every active site. They should also be separated in male and female. For every site it shall also be specified type of equipment, if any, for eventual disturbance of the eiders. If any birds will be shot shall that also be recorded in the journal. Even though Scanfjord will no longer be a member of SSPO as of mid-2019, the farmer has the intention of following the guidelines set by the control guide and keep recording the interactions of eider ducks with his farms.</p>		

PI 2.3.1		<p>The UoA meets national and international requirements for the protection of ETP species</p> <p>The UoA does not hinder recovery of ETP species</p>	
		<p>From discussions with Scanfjord, and the evidence provided through copies of the Eider duck Reports, the team has concluded that the likelihood of illegal shootings is very low. The deterring effect realised by shooting the birds is limited, and farmers have found that shooting is generally considered a waste of time and resources, hence the efforts put into alternative means of deterrence.</p> <p>There are no recent reports of entanglement of eiders in the farms. During the first experiments with the nets over and around the farms, a few birds got caught in the nets: the 50mm and 40mm nets had some by-catch, but the farmers are now using 30mm mesh size for the net, which does not catch or entangle any birds (personal comment Mats Lindegarth, University Gothenburg).</p> <p>With regards to other ETP species, such as seals or porpoise: consultation indicated no significant effects. Both seals and porpoise can sometimes be seen swimming near the mussel farms (possibly attracted to fish that hide between the long-lines), and seals can often be found resting on the buoys. There are no reported incidents of entanglement in the fishing gear.</p> <p>The fishery has limited to no direct effects on ETP species and is therefore highly likely to not hinder recovery of ETP species. SG 80 is met. However, no research has been identified to provide a high degree of certainty, so SG 100 is not met.</p>	
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	N
	Justification	<p>Indirect effects on ETP species might include disturbance, noise and pollution (farm waste).</p> <p>The license application process through the County Administrative Board ensures that mussel farms are not located in important breeding and nesting areas for birds, to limit the effects of disturbance. For farms in proximity to specific areas for marine mammals and birds, extra provisions may be made to decrease potential disturbance. Otherwise it is not deemed necessary to include requirements with regards to marine mammals and birds in the licenses (personal comments Mr. Larsson).</p> <p>Given the small scale of the farms, and the little amount of time a mussel farmer spends on one specific site, the effects due to disturbance and noise are deemed to be limited.</p>	

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	
		<p>With regards to waste (including defective material from the farms, like broken lines, or sinking buoys) special provisions are included in the permits, stating that all waste must be brought into the harbour and disposed of through proper channels (recycled or to the landfill). Based on the above, indirect effects are thought to be highly likely to not create unacceptable impacts. SG80 is met. However, no research or evidence has been identified to provide a high degree of certainty, so SG 100 is not met</p>
References	SSPO Eider control guide; Artdatabanken, 2015; ASCOBANS, 2010; personal comments Mr. Uddén, Mr. Lindegarth and Mr. Larsson http://artfakta.artdatabanken.se	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		-

Evaluation Table for PI 2.3.2 – ETP species management strategy

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>		
<p>Scoring Issue</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a</p>	<p>Management strategy in place (national and international requirements)</p>		
<p>Guidepost</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>
<p>Met?</p>	<p>Y</p>	<p>Y</p>	<p>N</p>
<p>Justification</p>	<p>MSC definitions: A “strategy” represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts. A “comprehensive strategy” (applicable only for ETP component) is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses.</p> <p>Sweden has for a long time had a comprehensive protection of species of wild animals and plants. The protection is governed by the Species Protection Ordinance, the Hunting Act and the Environmental Code.</p> <p>Since Sweden is a part of the European Union they also follow the Habitats Directive and Birds Directive. A total of 230 species of birds are protected under Swedish law under these directives, and the eider duck is included in the Species Protection Ordinance. However, the eider duck is in Annex II of the Birds Directive. The Annex II of the Birds Directive does not prohibit hunting on the species as long as conservation</p>		

<p>PI 2.3.2</p>	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>
	<p>measures at a national level are sustained, which indicates that the species is not considered critically endangered on European level. As a result, eider ducks may be hunted under the Hunting Regulation or the Hunting Act. In Sweden The Ministry of Agriculture is responsible for management of hunting, and the hunt is monitored and controlled by the Environmental Protection Agency (EPA). The next level is The County Administrative Boards that control the hunt on a more regional level. There is a county game committee with representatives from different businesses dependent on nature, as well as environmental protection interests, who give advice to the County Administrative Board regarding hunting. An application for culling can be made to the EPA or the County Administrative Board. The EPA delegates the decision on hunting of predators to the county administrative boards that have reproducing strain of the species in the county.</p> <p>When an application for culling comes in a stepwise assessment of the need for culling is made and decision is based on this. In recent years, no licences were issued to mussel farmers for shooting eider ducks (personal comment Mr. Larsson from the Västra Götaland County Adminstrative Board). The license process can therefore be regarded as a strategy to for managing the UoA’s impact on ETP species, including measures to minimise mortality (if a license is granted, the number of birds that can be shot is limited to around 10 per year).</p> <p>Following Article 7 of the Birds Directive, Sweden must ensure that the hunting of the species does not jeopardise conservation efforts in their distribution area. Sweden also must send the Commission all relevant information on the practical application of their hunting regulations. The coastal bird populations are monitored annually, and if needed conservation measures are taken. This represents an effective measure to assess the overall well-being of the population of the species within Sweden.</p> <p>The eider duck reports kept by the mussel farmer provides an additional layer of strategy, to gather information of the impact on the species. SG80 is met.</p> <p>However, the procedures put in place cannot be a “comprehensive strategy”, since research (testing of the strategy through monitoring and analyses) into the effects of culling eider ducks does not seem to exist, and the research into alternative measures has yet to be completed. SG 100 is not met.</p> <p>With regards to the other ETP species identified in Table 3 in Section 3.4.2: The only mammal included on the Swedish red list is harbour porpoise. The former Board of Fisheries and the Environmental Protection Agency jointly developed an action plan to preserve the harbour porpoise, the only cetacean species that occur year-round in Swedish waters. Bycatch in fisheries, pollution and ever increasing boat traffic</p>

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>		
	<p>are some of the main causes of porpoises around the Swedish coast decreases. SG80 is met for this element as well. With regards to the fishery under assessment, impacts on porpoise are non - existent. The same goes for seals (both common and grey). Seals and porpoise can sometimes be seen near the farms (possibly attracted to fish that hide between the long-lines). There are no reported incidents of entanglement in the fishing gear.</p>		
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?	n/a	n/a	n/a
Justification	Since there are requirements for protection and rebuilding provided through national ETP legislation or international agreements, the team has only scored scoring issue (a), following SA3.11.2.1.		
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

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>		
	Justification	<p>As stated above in PI2.3.2b, the mussel farmer works according to the eider duck control guide and will continue to do so after he has left SSPO. It is also clear that the mussel farmer mostly looks at non-lethal ways of deterring the birds, like putting nets around the farm, and chasing the birds away. There are currently a few tests ongoing in relation to eider duck deterrence, but no results have been published yet. These tests are carried out in cooperation with the University of Gothenburg. So far, using nets around and over the farm (like in salmon farming) seems promising. There are no reports of entanglement of eiders in the farms. During the first experiments a few birds got caught in the nets and drowned: the 50mm and 40mm nets had some by-catch, but the farmers are now using 30mm mesh size for the net, which does not catch or entangle any birds (observations from Univ. Gothenburg).</p> <p>This further limits the interactions with the ETP species, which provides an objective basis for confidence that the measures/partial strategy will work and SG80 is met. However, as there is no quantitative analysis carried out yet, SG100 is not met.</p>	
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	<p>Based on discussion during the site visit with Mr. Larsson from the County Administrative Board, Ms Strand from IVL, Mr. Lindegarth from University of Gothenburg and ornithologist Mr Uddén, there is some evidence that the non-lethal ways of deterring the birds, like putting nets around the farm, and chasing the birds away are implemented successfully, and is achieving its objectives. Furthermore, the Swedish government monitors the population through annual bird-counts, for which reports are available. SG80 is met. However, as there the tests on the alternative measures have not been finalised and the results not published, the team does not consider there to be clear evidence, and SG100 is not met.</p>	

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>			
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.	
	Met?	Y	Y	N
	Justification	<p>Based on discussion during the site visit with members of SSPO, Mr. Larsson from the County Administrative Board, Ms Strand from IVL, Mr. Lindegarth from University of Gothenburg and ornithologist Mr Uddén, mussel farmers focus on alternative measures to deterring eider ducks and minimize mortality. The fishery has been regularly reviewing its methods over the last five years, leading to the implementation of the eider duck control guide, and several measures have been trialled to limited interaction with the species altogether (e.g. net designs). Tests in cooperation with the University of Gothenburg are underway to improve on the current measure and quantify results over the next few years. Given that according to the FCR 'Regular review' means at least once every 5 years, the team considers SG80 met. However, as the tests have not been finalised and a biennial review of measures has not been put in place, the team does not consider SG100 to be met.</p>		
References	<p>SSPO Eider control guide; discussion during the site visit with members of SSPO, Mr. Larsson from the County Administrative Board, Ms Strand from IVL, Mr. Lindegarth from University of Gothenburg and ornithologist Mr Uddén; Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779; EC, 2009a; www.naturvardsverket.se</p>			
OVERALL PERFORMANCE INDICATOR SCORE:			80	
CONDITION NUMBER (if relevant):			-	

Evaluation Table for PI 2.3.3 – ETP species information

<p>PI 2.3.3</p>	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
<p>Scoring Issue</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a</p>	<p>Information adequacy for assessment of impacts</p>		
<p>Guidepost</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>
<p>Met?</p>	<p>Y</p>	<p>Y</p>	<p>N</p>
<p>Justification</p>	<p>It is still possible for farmers to apply for a license to shoot eider ducks, although no licenses have been issued in recent years. If a license is granted, the number of birds that can be shot is limited to around 10 per year, and it is a requirement for the farmer to inform the County Administrative Board of the number of birds shot. In case eider duck culling occurs, there is information present on the total numbers of eiders being shot. There are also estimations of the total population of eider ducks on the west coast. In years that eider ducks were shot, the number of birds shot were very low in relation to population estimates. Furthermore, the shooting licenses issued are very precautionary, for only a small number of eider ducks. Therefore, it does pose no threat to the protection and recovery of this ETP species. The information collected via the eider duck patrol reports is transferred to Vattenbrukscentrum Vast (part of the Gothenburg University). Although the data has not been fully analysed yet, it will be used in the future to study trends in eider ducks around the mussel farms. For</p>		

<p>PI 2.3.3</p>	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
		<p>Scanfjord, the Eider reports are part of the study into the effectiveness of deterrent measures, and provide a dataset from before and after the implementation of the new measures.</p> <p>There are no recent reports of entanglement of eiders (or other species) in the farms. During the first experiments with other deterrents (especially the nets over and around the farms) a few birds got caught in the nets: the 50 mm and 40 mm nets had some bycatch, but the farmers are now using 30 mm mesh size for the net, which does not catch or entangle any birds (observations from Univ. Gothenburg). The studies currently done on eider deterrent are done together with University of Gothenburg, who will use all available data (including analyses of behavioural changes in the birds) to measure the effectiveness of the measures and advise on possible changes in the design.</p> <p>Based on the above, some quantitative information is available and deemed 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. SG80 is met. However, there is no quantitative analysis carried out to ascertain a high degree of certainty of the full magnitude of UoA related impacts as yet. SG100 is not met.</p>	
<p>b</p>	<p>Information adequacy for management strategy</p>		
<p>Guidepost</p>	<p>Information is adequate to support measures to manage the impacts on ETP species.</p>	<p>Information is adequate to measure trends and support a strategy to manage impacts on ETP species.</p>	<p>Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.</p>
<p>Met?</p>	<p>Y</p>	<p>Y</p>	<p>N</p>
<p>Justification</p>	<p>If a license is granted, the number of birds that can be shot, is limited to around 10 per year, and it is a requirement for the farmer to inform the County Administrative Board of the number of birds shot. In case eider duck culling occurs, there is information present on the total numbers of eiders being shot. There are also estimations of the total population of eiders on the west coast. The data collected though the eider reports can be regarded as an additional data source with regards to impact of the fishery on the birds. The information available is adequate to measure trends and support a strategy to manage impacts on ETP species. SG80 is met.</p>		

PI 2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 	
	<p>However, research (testing of the strategy through monitoring and analyses) into the effects of culling eider ducks does not seem to exist beyond following trends in the population and monitoring the amount of birds shot by mussel farmers. Following implementation of the eider control guide and the associated eider reports, more data has been gathered and there are now records of eider numbers seen, combined with disturbance activities. The research into the effects of the alternative measures is underway, but as of now there is no comprehensive strategy in place, nor does the information available provide a high degree of certainty with regards to the objectives. SG100 is not met.</p>	
References	<p>SSPO Eider control guide; discussion during the site visit with members of SSPO, Mr. Larsson from the County Administrative Board, Ms Strand from IVL, Mr. Lindegarth from University of Gothenburg and ornithologist Mr Uddén; Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779; EC, 2009a; www.naturvardsverket.se</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		-

Evaluation Table for PI 2.4.1 – Habitats outcome

[FOR CAG BIVALVE FISHERIES, TEAMS SHALL ALSO TAKE INTO ACCOUNT THE SPECIFIC IMPACTS ASSOCIATED WITH ENHANCED CAG BIVALVE FISHERIES, AND FOR SUSPENDED CULTURE SYSTEMS, SCORING SHALL CONSIDER THE HABITAT IMPACTS OF BIO-DEPOSITION AND BENTHIC ORGANIC ENRICHMENT (FCR Annex SB 3.1.3, SB 3.1.3.1)]

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	N
	Justification	<p>The type of habitat that the mussel farms operate in is soft mud and this is considered the only ‘commonly-encountered habitat’ in this assessment. It is the most commonly occurring bottom substrate type on the Swedish west coast, as shown in Hallberg et al (2010) (Figure 11).</p> <p>Even though the Scanfjord mussel farms are the oldest farms on the Swedish West coast, the impact of the farms is reviewed every 10 years as part of the license renewal by the County Administrative Board.</p> <p>During the application process for a license from the County Administrative Board, the Board carries out an assessment of the area to which the license applies. In this assessment, the suitability of the benthic habitat in relation to the mussel farm, and the presence of nearby nature conservation areas are considered. Mussel farms are regarded by the County Administrative Board as ‘low risk’ with regards to habitat and the environment: the impact on habitat is seen as small, due to the scale of the farms, and the locations they are placed. The impact/effects from mussels are regarded as small and mostly positive with regards to eutrophication. However, potential impact from mussel farms are known from scientific literature and the impact of rope mussel culture on bottom habitats strongly depends on the existing water currents,</p>		

<p>PI 2.4.1</p>	<p>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.</p>
	<p>stocking densities, water depth and the presence of more sensitive habitats under or near the mussel ropes. In assessing the impact of a new proposed farm, the County Administration Board makes use of the information available on environmental aspects, as well as sea floor parameters to limit these impacts.</p> <p>Especially the build-up of organic material underneath mussel farms is known from literature, and this is considered in assessing the license application. Organic build-up can be expected under the site and in an area of 50 m around the farm. If an area is not deemed suitable at the time of assessment it is often possible to just move the site a few 100 meters to make sure no hard substrate is located near the farm (personal comments Mr. Larsson from the Västra Götaland County Administrative Board).</p> <p>Farms are established at sites with good water exchange, and not in the close vicinity of <i>Zostera</i>, i.e. eelgrass, beds. <i>Zostera</i> beds typically occur in areas with a smaller depth of 6 meters, which is not in the usual depth range for placement of farms, since the long line system most commonly used on the Swedish west coast requires a depth of at least 7-8 meters. Since mussels need good supply of plankton for fast growth, mussel farms are placed on locations with good water exchange, which makes the problems with organic build-up under the farm site less common.</p> <p>The scale and intensity of the cultivation system in Sweden can currently be defined as low: there is around 250 ha in use for mussel farms along the Swedish west coast, of which 227 ha is used by Scanjord and 1.5 ha by Västkostmusslor. Not all plots are used fully, and there is usual some rotation of the plots, creating fallow periods which allow for natural bioturbation and rehabilitation of the habitats to occur</p> <p>Although the build-up of organic material underneath and near the farm is not likely to be a problem, due to the location of the farms and occasional fallow periods, studies on the effects of mussel farms with regards to organic enrichment are being carried out by the University of Gothenburg and IVL Swedish Environmental Research Institute. This research is building on studies done in the UK. At present it is only carried out in a laboratory setting (personal comment Ms Strand, from IVL). The University of Gothenburg also has a student looking into benthic effects, and especially how reversible these effects are. The results of these studies will also feed into the licensing process.</p> <p>Based on the above, mussel farming in Sweden is judged as low impact on habitat. The scale of the fishery (both in size and intensity) have not changed much since the initial assessment. The team finds it highly unlikely that the UoA would reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. SG80 is met. Site-specific research and long-term monitoring of potential build-up of organic material under and near the farms has not been carried out, although the University of Gothenburg also has a student looking into benthic effects, and especially how reversible these effects are, and there is hope for a more</p>

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.		
		extensive research program. The current study of polychaetes as a potential solution for possible build-up is only done in a laboratory. Given the lack of evidence, SG100 is not 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
	Justification	As discussed in Section 3.4.3.2, the VMEs looked at are <i>Lophelia pertusa</i> reefs, Maërl beds, <i>Modiolus modiolus</i> beds, <i>Ostrea edulis</i> beds, Sea-pen and burrowing megafauna communities, Gas (or bubble) reefs, Deep-sea sponge aggregations and Haploops communities. The mussel farms do not overlap with known VMEs in Skagerrak/Kattegat. Moreover, the license application process for the farms looks in more detail at the habitat under and near the farms, and a farm is relocated if planned too close to hard substrate or to protected areas. On that basis, it is highly unlikely that the UoA would reduce structure and function of VME habitats to a point where there would be serious or irreversible harm. SG80 is met . However, since there has been no specific research into the distribution of VMEs found on the Swedish West Coast, nor has there been specific research on VMEs in relation to mussel farms, SG100 is not 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 minor habitat for this fishery is a rocky bottom under or near the farm, defined as 'bedrock', marked with red in Hallberg et al (2010) (Figure 11).		

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.	
		<p>Mussel farming in Sweden is judged as low impact on habitat. At the application for a license, an assessment is of the impact of this farm at the requested location. In this, the County Administration Board makes use of the information available on environmental aspects, as well as sea floor parameters. The type of habitat that the mussel farms operate in is typically the habitats occurring in soft mud, as this is the most commonly occurring bottom substrate type on the Swedish west coast. Some units may have rocky bottom under or near the farm, defined as 'bedrock', marked with red. This constitutes 'minor habitats' for this fishery. As discussed under SI2.4.1a, local effects from mussel farms because of build-up of organic material underneath the mussel farms are known from literature, this is considered in assessing the license application. Organic build-up can be expected under the site and in an area of 50 m around the farm. Sedimentation on the hard bottom/hard substrate is therefore not allowed. If an area is not deemed suitable, it is often possible to just move the site a few 100 meters to make sure no hard substrate is located near the farm (personal comments Mr. Larsson from the Västra Götaland County Administrative Board).</p> <p>There is evidence from the maps presented (e.g. see Figure 11. Bottom substrates on the Swedish west coast north of Gothenburg (source: Figure 7 in Hallberg et al, 2010) together with Figure 16) that subtidal rocky habitats are relatively widespread in the general inshore area, at least in relation to the very small footprint of the mussel farming. This constitutes additional evidence and overall can be concluded that the UoA is highly unlikely to reduce structure and function of minor habitats to a point where there would be serious or irreversible harm. The guidepost is met.</p>
References	<p>Hallberg et al, 2010; Länsstyrelsen i Västra Götalands Län, 2014;</p> <p>personal comments from Mr. Larsson from the Västra Götaland County Administrative Board and Ms Strand from IVL.</p> <p>https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		-

Evaluation Table for PI 2.4.2 – Habitats management strategy

[FOR CAG BIVALVE FISHERIES, TEAMS SHALL ALSO TAKE INTO ACCOUNT THE SPECIFIC IMPACTS ASSOCIATED WITH ENHANCED CAG BIVALVE FISHERIES, AND FOR SUSPENDED CULTURE SYSTEMS, SCORING SHALL CONSIDER THE HABITAT IMPACTS OF BIO-DEPOSITION AND BENTHIC ORGANIC ENRICHMENT (FCR Annex SB 3.1.3, SB 3.1.3.1)]

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	N
	Justification	A mussel management plan has been published as part of the Västra Götaland County Board Aquaculture Plan. This plan includes e.g. information on growth factors, potential conflicts of interest, and potential suitable locations (Länsstyrelsen i Västra Götalands Län, 2014). Furthermore, a study into the modelling of production areas finished in 2017. The information should be implemented in the 'Blue Plans' (spatial planning and strategy documents) from the County Board and municipalities. In these plans is detailed where aquaculture would have a good chance of success, and they will become part of the spatial planning tools used in assessing license applications. These plans together with the designation of Natura 2000-sites and the shore protection (strandskydd) in the environmental code are implemented through licensing process. Especially the Blue Plans and Natura 2000 licenses consider all activities in a certain area (such as recreation or other fishing practices) and can be regarded as a partial strategy to manage the impact of all MSC UoAs/non-MSC fisheries on habitats. SG80 is met. However, there is no strategy to monitor the benthic environment, and assess changes in structure and function of the benthic communities' present over time. SG100 is not met.		
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general	There is some objective basis for confidence that the measures/partial	Testing supports high confidence that the partial strategy/strategy will work, based on

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.		
		experience, theory or comparison with similar UoAs/habitats).	strategy will work, based on information directly about the UoA and/or habitats involved.	information directly about the UoA and/or habitats involved.
	Met?	Y	Y	N
	Justification	Given that a broad array of planning tools is used by the council in defining lease areas, which make use of the information available on habitat structure, there is some objective basis for confidence that the implementation of the Blue Plans and the Natura 2000 protected areas will work. SG80 is met. The effectiveness of the strategy has not been tested (there is no comprehensive monitoring plan or research project with the aim to assess the implementation of the strategy), so SG 100 is not 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	Given the information provided to the team on compliance with the licenses and the control efforts from the County Administrative Board on license requirements, the team considers that the license application system and available information on farming locations provide some quantitative evidence that the operational strategy is being successfully implemented. SG80 is met. SG100 is not met due to the lack of site-specific monitoring of the benthic environment, to assess changes in structure and function of the benthic communities over time.		
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.

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.		
	Met?	n/a	n/a	n/a
	Justification	As discussed above in PI2.4.1b, the mussel farms do not overlap with known VMEs in Skagerrak/Kattegat (see also Section 3.4.3.2.). Per GSA3.14.3 (MSC FCR v2.0), this scoring issue is not scored if there is no impact on VMEs by the UoA, other MSC UoAs, and other relevant non-MSC fisheries.		
References	Hallberg et al, 2010; Länsstyrelsen i Västra Götalands Län, 2014; MSC, 2014 personal comments from Mr. Larsson from the Västra Götaland County Administrative Board and Ms Strand from IVL. https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats			
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				-

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	<p>Extensive mapping of the Greater North Sea, including Skagerrak and Kattegat has taken place (see e.g http://www.emodnet-seabedhabitats.eu). Mapping has been done by OSPAR, and has been undertaken in light of the MSFD. Also, the Geological Survey of Sweden (SGU) has conducted mapping of Swedish sea benthic geological composition and structure since the late 1960s. The SGU has developed superficial substrate maps from available marine geological information in Swedish sea areas (see Figure 11).</p> <p>Therefore, the type of habitat that the mussel farms operate in is known at a level of detail relevant to the scale and intensity of the UoA. However, there is no definitive list of VME habitats within EU coastal waters, although the OSPAR list of threatened and/or declining habitats (https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats), together with additional habitats identified in the HELCOM red list of Baltic Sea underwater biotopes, habitats and habitat complexes (HELCOM 2013) allows for consideration of impacts to VME or VME-like indicator species and habitats.</p> <p>With respect to vulnerability of the main habitats (i.e. the second part of the SG80 requirements), the MSC defines ‘vulnerability’ as a combination of “The likelihood that the gear would encounter the habitat, and the likelihood that the habitat would be altered if an</p>		

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.			
		<p>encounter between the gear and the habitat did occur” (SA3.15.4, MSC FCR v2.0). Given the available information from OSPAR and HELCOM, the team is confident that the mussel farms do not overlap with known VMEs in Skagerrak/Kattegat (see also Section 3.4.3.2.).</p> <p>No mussel culture activities are allowed over sensitive habitats, and hard substrate is avoided. Muddy and sandy habitats are considered the least sensitive to the impacts of mussel culture (Huntington, 2006). SG80 is met.</p> <p>However, it is not clear that knowledge of the distribution of vulnerable habitats is known in sufficient detail to warrant a score of 100. As such, SG100 is not met.</p>		
b	Information adequacy for assessment of impacts			
	Guidepost	<p>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.</p> <p>OR</p> <p>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.</p>	<p>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.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	Y	Y	N
	Justification	Sufficient information is available on the general distribution of the habitats through e.g. the SGU maps. Given fixed spatial nature of the fishery, these habitat maps form reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. There is also sufficient information on the possible impacts of the fisheries, like build-up of organic material under and near the mussel farms. Habitat impacts from rope grown mussel farms have been extensively researched in other locations (e.g. UK, Denmark and The Netherlands). The similarity of gears and the conditions mean the impacts can be transcribed across into this fishery. Habitat impacts,		

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.	
		in relation to the nitrogen cycle, for 3 mussel farms have been quantified in the past (Carlsson et al, 2012). SG80 is met. However, this does not suggest full quantification of impacts on all habitats. SG100 is not met.	
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	The County administrative Board knows where the farms are located. Since they are responsible for the permitting process, they determine increase in risk to the habitat. There has also been habitat mapping where the mussel farms are located, through the work of SGU. Substrate maps will continuously be produced in areas of SGU surveys in the future. The marine geological maps show the original deposited material and reflect past and present hydrodynamic processes such as bottom currents, wave exposure, sediment-erosion, -transportation and -deposition as well as bathymetry. The purpose of this mapping is to produce information that is needed as a basis for social planning and decisions on use and protection of marine areas (SGU, 2010). However, site-specific research and long-term monitoring of potential build-up of organic material under and near the farms has not been carried out. Based on the general surveys, adequate information continues to be collected to detect any increase in risk to the main habitats, SG80 is met. However, changes in habitat distributions as a result of the mussels farms (e.g. due to build-up of organic material) over time are not measured (yet) and SG100 is not met.	
References	Carlsson et al, 2012; Huntington et al, 2006; HELCOM, 2013a; SGU, 2010 http://www.emodnet-seabedhabitats.eu https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats		
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			-

Evaluation Table for PI 2.5.1 – Ecosystem outcome

[FOR CAG BIVALVE FISHERIES, TEAMS SHALL ALSO TAKE INTO ACCOUNT THE SPECIFIC IMPACTS ASSOCIATED WITH ENHANCED CAG BIVALVE FISHERIES (FCR Annex SB 3.1.3, SB 3.1.3.1)]

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	<p>Regular monitoring of all the main Swedish West Coast ecosystem’s physical and biological attributes (like salinity, primary production, water quality, coastal bird populations) takes place because of the Water Framework Directive (WFD: EC, 2000), and Natura 2000 legislation (Birds- and Habitats Directives: EC, 2009a and EC, 1992 respectively). The ecological carrying capacity for the Swedish West Coast has been measured (Lindahl, 2007) and underpins the allowance of (new) licences.</p> <p>With regards to ecosystem impacts, the main possible effect is a result of the filter feeding by the mussels. Removing food from the water means reduced food for other filtering organisms in the close vicinity. Phytoplankton depletion can occur in suspended mussel culture if the ecological carrying capacity of the body of water in which the farms are located is exceeded. It has been measured that one hectare of mussel farm requires between 15-25 hectares of primary production (Lindahl, O., 2007 in FCI, 2014) which gives an idea of how much mussel production can be sustained in a specific area. This number is calculated from a set level of primary production, and the number used is the long term mean for primary production between 1985-2006 (230 gC/m²/year¹).</p> <p>The carrying capacity of the mussel farming areas along the Swedish West Coast is not deemed to be a limiting factor in phytoplankton production across this ecosystem. In Skagerrak/Kattegat and the Baltic, the levels of eutrophication are high. Mussel farming is seen as a way of reducing the level of eutrophication and improving the water quality (personal comments Ms Strand, Mr. Larsson). In certain areas</p>		

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	
		<p>the Swedish government is looking to see if artificial mussel beds (or an increase in shellfish farms) can be used to combat the problems that occur due to eutrophication (like poor visibility, or toxic algae blooms).</p> <p>The number of licenses provided by the County Board are based on a simple production model, which relies on the primary production as measured by Lindahl, 2007. Under the current system, there is room to grow the mussel production to 50,000 t. Currently, around 1,500 t mussels are harvested each year (of the approximately 13,000 t licensed). Since the production has not even reached the level for the total permits given, the current production volume is not regarded as a problem in light of the carrying capacity of the ecosystem.</p> <p>The rope grown mussel culture offers an additional settling substrate to mussel larvae. This has potentially positive effects on the total number of mussel larvae that settle successfully. It is very likely that suspended mussel culture has a positive effect on the recruitment of the mussel stock.</p> <p>When assessing the total nitrogen contribution from the farms, in relation to the removal via mussel harvesting it was established that there was a net uptake of nitrogen from the farms, as only 26-40% of the amount corresponding to the harvested nitrogen was released to the water column by deposits from the mussels (Carlsson et al., 2012).</p> <p>With regards to impacts on the ecosystem from farm waste (plastics, ropes etc), as part of permit conditions, farmers are obliged to bring all waste back to land to be collected and incinerated.</p> <p>Based on the above, 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. SG100 is met.</p>
References	EC, 1992; EC, 200; EC, 2009a; FCI, 2014; Carlsson et al, 2012; Lindahl, O., 2007; personal comments Ms Strand, Mr. Larsson	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		-

Evaluation Table for PI 2.5.2 – Ecosystem management strategy

[FOR CAG BIVALVE FISHERIES, TEAMS SHALL ALSO TAKE INTO ACCOUNT THE SPECIFIC IMPACTS ASSOCIATED WITH ENHANCED CAG BIVALVE FISHERIES (FCR Annex SB 3.1.3, SB 3.1.3.1)]

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	A study into the modelling of production areas finished in 2017. The information is implemented in the 'Blue Plans' (spatial planning and strategy documents) from the County Administrative Board and municipalities. In these plans is detailed where aquaculture would have a good chance of success. Furthermore, the Aquaculture Strategy (Jordbruks Verket, 2012), and accompanying Action Plan (Jordbruksverket, 2014) have been put in place. The Water Framework Directive (WFD: EC, 2000) has been incorporated into the Swedish Environmental Code (Miljöbalk, 1998). The environmental code prescribes legislation for the discharges of waste water, other discharges and emissions or pollutants, and noise, vibration, light, radiation etc. As a result of the implementation of the WFD (and the EU Shellfish Directive, which has become part of the WFD), Sweden monitors the water quality both with regards to ecological parameters (like primary production, seagrass occurrence, salinity, etc) and with regards to food quality (toxic algae and tracking of algal blooms). Through the licensing system (some of) the measures have been applied to the mussel farms. SG100 is met.		
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general	There is some objective basis for confidence that the measures/partial strategy will work, based on some	Testing supports high confidence that the partial strategy/strategy will work, based on

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.		
		experience, theory or comparison with similar fisheries/ ecosystems).	information directly about the UoA and/or the ecosystem involved	information directly about the UoA and/or ecosystem involved
	Met?	Y	Y	N
	Justification	The impacts of the UoA on ETP species and habitats are negligible (see scoring Principle 2 above), and the licensing process seems to work well. There is therefore high confidence that the overall impacts of the UoA on the ecosystem are constrained to a low level and the strategy is working. SG80 is met. In relation to the water quality (through the EU Water Framework Directive and the Marine Strategy Framework Directive), Sweden will have to provide some monitoring of the ecosystem. There is, however, nothing that constitutes ‘testing’ in relation to the measures put in place for the mussel farms, so SG100 is not 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	The impacts of the UoA on ETP species and habitats are negligible (see scoring Principle 2 above), and the licensing process seems to work well, thus providing some evidence that the partial strategy is being implemented successfully. SG80 is met. Since there is little monitoring and research being done in relation to the mussel farms, there is no clear evidence that the strategy is achieving its objective. SG100 is not met.		
References		Jordbruksverket, 2012; Jordbruksverket, 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				-

Evaluation Table for PI 2.5.3 – Ecosystem information

[FOR CAG BIVALVE FISHERIES, TEAMS SHALL ALSO TAKE INTO ACCOUNT THE SPECIFIC IMPACTS ASSOCIATED WITH ENHANCED CAG BIVALVE FISHERIES (FCR Annex SB 3.1.3, SB 3.1.3.1)]

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	Information about the ecosystem services provided by the Skagerrak area, and basic information about the ecosystem in form of explanations about primary production, food web dynamics, biodiversity, habitats, resilience, biological regulation, genetic resources, trophic interactions and threatened species etc. are compiled in the report from the Swedish EPA (Garpe, 2008). Carbon, nitrogen, oxygen and hydro biological cycles are also explained. Information is therefore adequate to broadly understand the key elements of the ecosystem. SG100 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	With regards to ecosystem impacts, the main possible effect of mussel farming on rope grown culture are known, either from studies in the Swedish rope grown mussel culture, or from elsewhere (like suspended cultures in The Netherlands, Denmark or Ireland). The main impacts are the impact on the carrying capacity of the ecosystem (phytoplankton depletion due to filter feeding), effects on the		

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.	
		<p>recruitment of the mussel stock, nitrogen contribution from mussel farms and deposition of organic material (shells, faeces and pseudofaeces) underneath the farms.</p> <p>Some of these impacts have been studied in detail, like the carrying capacity of the Swedish west coast areas: The number of licenses provided by the County Board are based on a production model, in which the aim is to grow the mussel production to 50,000 t. SG80 is met.</p> <p>Not all main interactions between the UoA and these ecosystem elements have been investigated in detail (e.g. site-specific benthic enrichment) SG100 is not met.</p>	
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	Main functions of the target species, ETP species, and habitats in the ecosystem are understood, e.g. like the role of mussels as filter feeders and as food source for birds. Relative impacts of the UoA on these components have been identified and e.g. addressed in section 3.4.2.1 and 3.4.3.3. SG100 is 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	Y

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.	
	Justification	Sufficient information is available on UoA impacts on the components and ecosystem elements (like carrying capacity, nutrient cycles etc) to allow for inference of main consequences on the relevant ecosystems. SG100 is 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	N
	Justification	In relation to the water quality (through the EU Water Framework Directive and the Marine Strategy Framework Directive), Sweden will have to provide some monitoring of the ecosystem. This would provide adequate data to detect any increase in risk level. SG80 is met. There is, however, nothing that constitutes 'testing' in relation to the measures put in place for the mussel farms. It is therefore unclear whether information is adequate to support development of strategies to manage ecosystem impacts in the future. SG100 is not met.	
References		Garpe, 2008; EC, 2008; EC, 2000	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			-

Principle 3 scoring rationales

[WHERE P1 IS NOT SCORED, TEAMS SHALL FOCUS P3 SCORING ON WHETHER OR NOT THE APPROPRIATE AND EFFECTIVE LEGAL AND/OR CUSTOMARY FRAMEWORK IS CAPABLE OF DELIVERING SUSTAINABLE FISHERIES IN ACCORDANCE WITH P2 PIs (*FCR Annex SB 4.1.2*). IN THIS SITUATION, TEAMS MAY REMOVE REFERENCES TO P1 IN THE EVALUATION TABLE BELOW]

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

PI 3.1.1	The management system exists within an appropriate legal and/or customary framework which ensures that it:		
	<ul style="list-style-type: none"> • 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 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 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 2.
Met?	Y	Y	Y
Justification	The fishery is managed within the context of EU's Common Fisheries Policy (CFP), whose provisions are transposed into Swedish national legislation. Sweden has a well-established system for fisheries management, which has evolved over decades and is now codified in the 1993 Fisheries Act (last revised 2016) and secondary legislation. The Act applies to fisheries within Swedish territorial waters, the Swedish EEZ and Swedish fisheries beyond the economic zone. It contains provisions on the right to fish (§§ 8–13), licensing (§§ 29–32), enforcement (§§ 33–36), penal sanctions (§§ 37–50) and administrative sanctions (§§ 51–60). Importantly, § 19 determines that the Government can issue regulations that ban or limit catch, the use of specific gear and fishing grounds. The main regulatory measures are specified in the 1994 Regulation on Fisheries, Aquaculture and the Fishing Industry (last revised 2016).		

		<p>The executive power in Swedish fisheries management is the Swedish Agency for Marine and Water Management (SwAM – in Swedish: Havs- og vattenmyndigheten, HAV), located in Gothenburg and formally subordinate to the Ministry of Environment and Energy (in Swedish: Miljö- och energidepartementet). SwAM has a Department for Fisheries, which has sections for fisheries policy, licensing, landing control and a Fisheries Monitoring Centre (FMC). Fisheries science is conducted primarily by the Swedish University of Agricultural Sciences (in Swedish: Sveriges lantbruksuniversitet, SLU), through its Department of Aquatic Resources.</p> <p>Management of mussel production in Sweden falls mainly under the purview of the National Board of Agriculture (in Swedish: Jordbruksverket), which is subordinate to the Ministry of Enterprise and Innovation (in Swedish: Näringsdepartementet), and the county administrative boards. Hence, the mussel industry is fundamentally subject to the fisheries legislation, cf. the above mentioned regulation which covers both fisheries and aquaculture, while specific rules are mostly set by the National Board of Agriculture and the county administrative boards. In addition to the Fisheries Act, the main legal basis for regulations is the 1998 Environmental Code (last revised 2018), which amalgamated 15 previous acts and replaced similar rules from different sectors with common rules across functional fields. The Code is a major piece of legislation, containing 500 sections over nearly 100 pages. The county administrative boards issue production permits and enforce regulations. Also involved in the management of mussel production is the National Food Administration (in Swedish: Livsmedelverket) and the National Veterinary Institute (Statens veterinärmedicinska anstalt), both subordinate to the Ministry of Enterprise and Innovation, which monitor the quality of food production. The National Food Administration has the authority to open and close areas for production, and it also keeps track of production in the mussel industry. Scientific research is carried out by, e.g. the Swedish Environmental Research Institute (IVL – in Swedish: Svenska miljöinstitutet).</p> <p>Through the Fisheries Act, Environmental Code and secondary legislation, binding procedures for cooperation between the different governmental agencies involved are in place, able to provide management outcomes that are consistent with MSC Principle 2 (P1 is not scored). SG 100 is met.</p>		
b	Resolution of disputes			
Guided post	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	<p>At national level in Sweden, there is an effective, transparent dispute resolution mechanism in place, as fishers can take their case to court if they do not accept the rationale behind an infringement accusation by enforcement authorities or the fees levied against them. Verdicts at the lower court levels can be appealed to higher levels. The Environmental Code further establishes a system of environmental courts, which function as the first level of hearing for issues within the Code's sphere of authority. The general district courts function as regional environmental courts. The Superior Environmental Court is the Svea Court of Appeal, while the final court of appeal is the Supreme Court. The Environmental Code provides detailed provisions for how the courts shall function when they are set as environmental courts (Chapters 20–23). The working of the court system is fully transparent in Sweden, and the system is tested and proven to be effective in that court decisions are always implemented.</p> <p>In the fishery under assessment, potential disputes are usually resolved through discussions at the county boards. These discussions are transparent and have proven to be effective as a dispute resolution mechanism appropriate to the context of the fishery. SG 100 is met.</p>		
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	<p>EU member states are obliged, according to the 2013 CFP, to include social and economic dimensions in their criteria for allocation of quota rights, among them the contribution to the local economy and historic catch levels (Art. 17). Protection of the interests of coastal communities dependent on fisheries is also one of the rationales for the principle of relative stability in fishing rights between the member states (Recital (35)). Among the objectives of the CFP is to foster job creation and economic development in coastal areas (Recital (12)) and to contribute to a fair standard of living for those who depend on fishing activities, bearing in mind coastal fisheries and socio-economic aspects (Art. 2 f)). Marine biological resources in the outermost parts of the Union shall be secured special protection due their importance to the local economy, and certain types of fishing activities shall be limited to fishing vessels registered in the ports of those territories (Recital (21)).</p> <p>No people dependent on fishing for food have been identified in Swedish fisheries. Through the established system for quota distribution, the management system observes the legal rights of people dependent on livelihood in a manner that is consistent with the objectives of MSC principle 2. Quota shares are established on the basis of historical rights and are not transferable. There are also separate coastal quotas that ensure that coastal fishers are able to live off their traditional small-scale fishery. There is a formal commitment to these rights in Swedish legislation. Likewise,</p>		

	in the mussels industry the legal rights of people dependent on mussels production is formally committed to in Swedish law through the permit allocation system at county administrative level. SG 100 is met.
References	<p>Fiskelag (1993:787) [Fisheries Act], Svensk författningssamling 1993:787 t.o.m. SFS 2016:824.</p> <p>Förordning (1994:1716) om fisket, vattenbruket och fiskerinäringen [Regulation on on Fisheries, Aquaculture and the Fishing Industry], Svensk författningssamling 1994:1716, t.o.m. SFS 2016:826.</p> <p>Interviews with representatives of Västra Götaland County Administrative Board, the National Aquaculture Board, SFPO, SSPO and individual mussels producers during the site visit.</p> <p>Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779.</p> <p>Regulation (EU) No. 1380/2013 of the European Parliament and of the Council on the Common Fisheries Policy, amending Council Regulations (EC) No. 1954/2003 and (EC) No. 1224/2009 and repealing Council Regulations (EC) No. 2371/2002 and (EC) No. 639/2004 and Council Decision 2004/585/EC.</p> <p>Websites of the National Board of Agriculture (www.jordbruksverket.se), the Ministry of Environment and Energy (www.regeringen.se/sveriges-regering/miljo-och-energidepartementet), the Ministry of Enterprise and Innovation (www.regeringen.se/sveriges-regering/naringsdepartementet), the National Food Administration (www.livsmedelsverket.se), the National Veterinary Institute (www.sva.se), SwAM (www.havochvatten.se), the Swedish Environmental Research Institute (www.ivl.se) and the Swedish University of Agricultural Sciences (www.slu.se).</p>
OVERALL PERFORMANCE INDICATOR SCORE:	100
CONDITION NUMBER (if relevant):	-

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
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 functions, roles and responsibilities of all actors in the Swedish system for mussel production, as well as in fisheries management more widely, are explicitly defined in the Environmental Code, the Fisheries Act and supporting legislation. As laid out under SI 3.1.1a above, governance functions are split between different ministries and other bodies of governance at the national level, as well as the county administrative boards. Different user groups are well integrated in the management process; see SI 3.1.2b below. According to our interviews during site visit, the functions, roles and responsibilities are well understood for all areas of responsibility and interaction. SG 100 is 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	Y
	Justification	<p>Sweden has a long tradition of including non-governmental organizations in fisheries management, with continuous consultation and close cooperation between governmental agencies and user-group organizations – this is in line with the general ‘consensus culture’ in the country. Representatives of the various public authorities involved in the regulation of the mussel industry, in particular the National Board of Agriculture, the National Food Administration and the County Administrative Boards, have regular discussions with individual mussels producers and their organizations. Lines of communication are short, and much contact is spontaneous and happens in direct contact between industry representatives and the authorities. Among the more formal meeting places are the reference group for aquaculture (in Swedish: referensgruppen för vattenbruk) under the National Board of Agriculture, and the regional centres for aquaculture (in Swedish: vattenbrukscentra). Here stakeholders from a range of different sectors meet, including government, industry, science and NGOs. Further, all governmental agencies at national level are required to have a Council for Public Access to Information (in Swedish: insynsråd) consisting of politicians and representatives of civil society, business and other state bodies of governance. Their aim is to ensure that the public receives necessary information on the working of the governmental institution. All changes in legislation in Sweden is subject to public hearings, which provides an additional layer of consultation.</p> <p>All stakeholders interviewed at the site visit report consultation processes to be inclusive and transparent, with management authorities displaying consideration of the information obtained from stakeholders and explaining how it is used or not used. SG 100 is met.</p>		
c	Participation			
	Guided post		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	Y
	Justification	<p>As follows from SI 3.1.2 b) above, the consultation processes provide opportunity for all interested and affected parties to be involved at both national and regional level. All stakeholders consulted during the assessment, report that management authorities actively facilitate their involvement, for instance through formal invitations to take part in meetings. They are also given the opportunity to influence the agenda of the meetings. Meetings at the reference group for aquaculture are not publicly announced, but all interested and affected parties – including all environmental NGOs that have showed interest for the mussel industry – are provided the opportunity and encouraged to take part. Hence, the authorities actively facilitate their engagement, and SG 100 is met.</p>		

References	<p>Fiskelag (1993:787) [Fisheries Act], Svensk författningssamling 1993:787 t.o.m. SFS 2016:824.</p> <p>Förordning (1994:1716) om fisket, vattenbruket och fiskerinäringen [Regulation on on Fisheries, Aquaculture and the Fishing Industry], Svensk författningssamling 1994:1716, t.o.m. SFS 2016:826.</p> <p>Interviews with representatives of Västra Götaland county administrative board, the National Aquaculture Board, SFPO, SSPO and individual mussels producers during the site visit.</p> <p>Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779.</p> <p>Websites of the National Board of Agriculture (www.jordbruksverket.se), the Ministry of Environment and Energy (www.regeringen.se/sveriges-regering/miljo-och-energidepartementet), the Ministry of Enterprise and Innovation (www.regeringen.se/sveriges-regering/naringsdepartementet), the National Food Administration (www.livsmedelsverket.se), the National Veterinary Institute (www.sva.se), SwAM (www.havochvatten.se), the Swedish Environmental Research Institute (www.ivl.se) and the Swedish University of Agricultural Sciences (www.slu.se).</p>
OVERALL PERFORMANCE INDICATOR SCORE:	100
CONDITION NUMBER (if relevant):	-

Evaluation Table for PI 3.1.3 – Long term objectives

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 current CFP regulation requires that member states, in accordance with international treaties such as the 1982 Law of the Sea Convention, the 1993 FAO Compliance Agreement and the 1995 Fish Stocks Agreement, apply the precautionary approach to fisheries management. The precautionary principle is also listed as a central objective in other EU legislation and policy document of relevance for the fishery, such as the Marine Spatial Planning Directive, the Marine Strategy Directive and the Water Framework Directive. At national level in Sweden, the 1993 Fisheries Act and 1994 Regulation on Fisheries, Aquaculture and the Fishing Industry are sparse in terms of declared objectives, but contained in their numerous practical regulatory measures (see SI 3.1.1a above) are at least implicit clear long-term objectives that guide decision-making consistent with the MSC standard and the precautionary approach. In the management plans and other official documents, such as the 2002 National Strategy for Sustainable Development, such objectives are explicit, e.g. sustainable use, precaution and ecosystem considerations. As these documents are not formalized in national law, they cannot be considered required by management policy. In the Environmental Code, however, the precautionary principle is defined as the fundamental objective. Further, as Sweden also conforms to the CFP, and is implementing other EU legislation there are still sufficient clear long-term objectives consistent with MSC fisheries standard and the precautionary approach, explicit within and required by management policy. SG 100 is met.		
References	<p>DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2000 establishing a framework for Community action in the field of water policy.</p> <p>DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).</p>		

	<p>DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 July 2014 establishing a framework for maritime spatial planning.</p> <p>Fiskelag (1993:787) [Fisheries Act], Svensk författningssamling 1993:787 t.o.m. SFS 2016:824.</p> <p>Förordning (1994:1716) om fisket, vattenbruket och fiskerinäringen [Regulation on on Fisheries, Aquaculture and the Fishing Industry], Svensk författningssamling 1994:1716, t.o.m. SFS 2016:826.</p> <p>Förvaltningsmål för nationellt förvaltade fiskbestånd [Management Objectives for Nationally Managed Fish Stocks], Aqua Reports 2016: 10.</p> <p>Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779.</p> <p>Regulation (EU) No. 1380/2013 of the European Parliament and of the Council on the Common Fisheries Policy, amending Council Regulations (EC) No. 1954/2003 and (EC) No. 1224/2009 and repealing Council Regulations (EC) No. 2371/2002 and (EC) No. 639/2004 and Council Decision 2004/585/EC.</p> <p>Sweden's National Strategy for Sustainable Development 2002, Government Communication 2001/02:171.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	100
CONDITION NUMBER (if relevant):	-

Evaluation Table for PI 3.2.1 Fishery-specific objectives

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	N
	Justification	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 2, are explicit within Swedish system for fisheries management; cf. the Fisheries Act and the Regulation on Fisheries, Aquaculture and the Fishing Industry (see SI 3.1.1a). However, this component relates to the fishery-specific management system, not the general management framework, so the objectives of the Västra Götaland mussel production must be assessed. The 2012 Strategy for Swedish aquaculture says little about the mussel industry specifically, and its goals are not very specific, e.g. increase in production, high quality products and sustainable development. In the concretization of the Strategy – the Plan of Action, which also covers the mussel production specifically – short and long-term objectives are explicit; these are related to the ecological, economical and social sustainability of the industry. The same is true for the Aquaculture Plan for Västra Götaland. SG 80 is met. However, the objectives are not well defined and measurable, so SG 100 is not met.		
References	<p>Fiskelag (1993:787) [Fisheries Act], Svensk författningssamling 1993:787 t.o.m. SFS 2016:824.</p> <p>Förordning (1994:1716) om fisket, vattenbruket och fiskerinäringen [Regulation on Fisheries, Aquaculture and the Fishing Industry], Svensk författningssamling 1994:1716, t.o.m. SFS 2016:826.</p> <p>Förvaltningsmål för nationellt förvaldade fiskbestånd [Management Objectives for Nationally Managed Fish Stocks], Aqua Reports 2016: 10.</p>			

	<p>Handlingsplan för utveckling av svenskt vattenbruk – konkretisering av Strategi 2012-2020 [Plan of Action for the Development of Swedish Aquaculture – Concretization of Strategy 2012-2020], National Board of Agriculture, 2015.</p> <p>Sweden’s National Strategy for Sustainable Development 2002, Government Communication 2001/02:171.</p> <p>Swedish Aquaculture – a Green Industry in Blue Fields, National Board of Agriculture [‘Aquaculture Strategy’], 2012.</p> <p>Vattenbruksplan för Västra Götaland – marina områden [Aquaculture Plan for Västra Götaland – Marine Areas], Västra Götaland County Administrative Board, 2014</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	-

Evaluation Table for PI 3.2.2 – Decision-making processes

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	Established decision-making procedures at national and county level in Sweden ensure that strategies are produced, and measures taken to achieve the fishery-specific objectives (see SI 3.1.1a above). The system includes extensive consultation mechanisms with user groups (see SI 3.1.2b above). The enforcement system is further described under PI 3.2.3 below. SG 80 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	Y
	Justification	According to our interviews during the site visit, the established decision-making procedures respond to all issues identified in research, monitoring, evaluation or by groups with an interest in the fishery. This is ensured through the arenas for regular consultations between governmental agencies and the public, as well as both regular and ad hoc consultation with the industry and other stakeholders (see SI 3.1.2b above). In addition, there is close contact between authorities and scientific research institutions. Both scientists and user-group representatives claim that the relevant		

		government agencies are open to any kind of input at any time; cf. interviews during the site visit. They feel that the authorities' response is transparent and timely and that the ensuing policy options take adequate account of their advice. It is a principal challenge to claim that absolutely 'all' issues are responded to, but from an opposite point of view, we cannot see that their issues that are not responded to in this fishery. SG 100 is met.		
c	Use of precautionary approach			
	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	Decision-making processes are based on relevant scientific research by IVL and SLU, and management is based on the precautionary approach; see PI 3.1.3 above. SG 80 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	The national bodies of governance, the scientific research institutions and the county administrative boards all produce annual reports that provide extensive information on the fishery's performance and management action, including explanations for response to findings and recommendations from research and review activities. These are available to the public on request. As accounted for under SI 3.1.2b, all public authorities in Sweden have an advisory council for public access to information ('insynsråd') within its sphere of work. SG 80 is met. However, this stops short of formal reporting to all interested stakeholders. SG 100 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 authority is not subject to continuing court challenges. When occasionally taken to court by fishing companies, the management authority complies with the judicial decision in a timely manner. According to interviews at the site visit, NGOs often object when fish farms apply for permit to open new areas for production of extend existing production areas, and it happens that such cases go to court (although rarely, if ever, this happens in the mussel industry). Even if the state loses the case, it will rapidly implement the judicial decision. The management authority works proactively to avoid legal disputes through the tight cooperation with user-groups at the regulatory level (see PI 3.1.2 above), ensuring as high legitimacy as possible for regulations and other management decisions. Regulatory authorities offer advice to the industry on how to avoid infringements. Only the most serious cases lead to prosecution by the police and possible transfer to the court system. SG 100 is met.		
References	<p>Fiskelag (1993:787) [Fisheries Act], Svensk författningssamling 1993:787 t.o.m. SFS 2016:824.</p> <p>Förordning (1994:1716) om fisket, vattenbruket och fiskerinäringen [Regulation on on Fisheries, Aquaculture and the Fishing Industry], Svensk författningssamling 1994:1716, t.o.m. SFS 2016:826.</p> <p>Interviews with representatives of Västra Götaland county administrative board, the National Aquaculture Board, SFPO, SSPO and individual mussels producers during the site visit.</p> <p>Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779.</p> <p>Websites of the National Board of Agriculture (www.jordbruksverket.se), the Ministry of Environment and Energy (www.regeringen.se/sveriges-regering/miljo-och-energidepartementet) , the Ministry of Enterprise and Innovation (www.regeringen.se/sveriges-regering/naringsdepartementet), the National Food Administration (www.livsmedelsverket.se), the National Veterinary Institute (www.sva.se), SwAM (www.havochvatten.se) , the Swedish Environmental Research Institute (www.ivl.se) and the Swedish University of Agricultural Sciences (www.slu.se).</p>			

OVERALL PERFORMANCE INDICATOR SCORE:	95
CONDITION NUMBER (if relevant):	-

Evaluation Table for PI 3.2.3 – Compliance and enforcement

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	N
Justification	<p>The EU system for fisheries control is laid out in the Control Regulation, which entered into force in 2010. The Regulation applies to all activities covered by the CFP carried out on the territory of member states or in EU waters, and by EU fishing vessels or nationals of a member state (Art. 2). It requires all member states to adopt appropriate measures, allocate adequate financial, human and technical resources and set up all administrative and technical structures necessary for ensuring control, inspection and enforcement of activities under the CFP (Art. 5). The Regulation contains Titles ('sections' above chapter level) on, among other things, access to waters and resources (Title III), control of fisheries (Title IV), control of marketing (Title V), surveillance (Title VI), inspections and proceedings (Title VII), enforcement (Title VIII) and common control programmes (Title IX). Procedures are established for situations where infringements are detected (Art. 82-88), including enhanced follow-up when infringements are serious (Art. 84). Further, provisions are given for proceedings (Art. 85-88) and sanctions (Art. 90-93) (see PI 3.2.3 b) below).</p> <p>The legal basis for enforcement of Swedish fishery regulations is found in the Fisheries Act §§ 33–36, according to which fishery inspectors ('fisketillsynsmän') can be appointed both under the national bodies of governance and the county administrative boards. A similar provision is found in Chapter 26 of the Environmental Code. As mentioned under SI 3.1.1a above, the National Food Administration has the authority to keep track of production in the mussel industry. Physical control is carried out by the county administrative boards, in the present fishery: the administrative board of Västra Götaland. The control focuses on the conditions that are tied to the licenses, e.g. that the farms are within the right positions, that they are marked correctly, have the right equipment that is consistent with the license, that they are farming the right species and that they are handled in a</p>		

		<p>way so that they do not contribute to the spread of infections. Each farm is inspected every 2-3 years. In 2017, 64 sites were inspected out of 100 licensed sites. In the opinion of the enforcement body, this is sufficient, while other stakeholders claim that controls should be more frequent.</p> <p>Hence a monitoring, control and surveillance system has been implemented in the fishery and demonstrated an ability to enforce relevant regulations; see SI 3.2.3c. SG 80 is met. While it may be argued that this level of enforcement is sufficient for the scale and context of the fishery, as enforcement authorities claim, it may also be questioned, as it was by some stakeholders during the site visit. A precautionary scoring therefore implies that SG 100 is not met.</p>		
b	Sanctions			
	Guidpost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	Y
	Justification	<p>In accordance with the EU Control Regulation, member States are required to ensure that appropriate measures are systematically taken when violations of fishing regulations are detected, including administrative action or criminal proceedings, to provide effective deterrence (Art. 89).</p> <p>At national level in Sweden, the Fisheries Act provides detailed provisions of penal (§§ 37–50) and administrative (§§ 51–60) sanctions. The most important penal sanctions are fines, prison up to one year (up to two years for particularly serious infringements) and confiscation of catch, gear or vessel. Administrative sanctions include a ‘sanction fee’ in the range SEK 1,000–500,000. If the fishers do not accept a sanction, they can take their case to court. The decision of a lower-level court can then be appealed to higher-level courts. The same applies to the environmental sphere, where Chapter 29 of the Environmental Code sets out the different penal actions available to authorities. a fine or a term of imprisonment not exceeding two years for environmental offence. If the offence is serious, the penalty shall be a term of imprisonment of not less than six months nor more than six years.</p> <p>The effective enforcement system (see SI 3.2.3a above) combined with the high level of compliance (see SI 3.2.3c below) makes it reasonable to assume that the system provides effective deterrence. SG 100 is met.</p>		
c	Compliance			
	Guidpost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when	Some evidence exists to demonstrate fishers comply with the management system under assessment,	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing

		required, providing information of importance to the effective management of the fishery.	including, when required, providing information of importance to the effective management of the fishery.	information of importance to the effective management of the fishery.
	Met?	Y	Y	Y
	Justification	According to the Västra Götaland county administrative board, there have been no serious infringements of regulations in the UoA fishery since the control mechanism was introduced in 2014. This is stated in interview during the site visit and substantiated by a list of inspections and infringements presented to the assessment team. The high level of compliance is attributed to the high degree of responsibility that producers feel for the sustainable management of the resource. The user-group representatives interviewed at the site visit are of the same opinion, emphasizing that it is in everybody's interest that the production takes place according to regulations. Enforcement authorities also confirm that fishers provide information of importance to the effective management of the industry. Based on this, we conclude there is a high degree of confidence that fishers generally comply with the regulations. SG 100 is met.		
d	Systematic non-compliance			
	Guidpost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	As demonstrated under PI 3.2.3 c) above, there is no evidence of systematic non-compliance in the fishery. SG 80 is met.		
References	<p>COUNCIL REGULATION (EC) No 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006.</p> <p>Fiskelag (1993:787) [Fisheries Act], Svensk författningssamling 1993:787 t.o.m. SFS 2016:824, last updated 2017.</p> <p>Fiskeriverkets föreskrifter (FIFS 2004:25) om resurstillträde och kontroll på fiskets område [The Fisheries Directorate's Regulation on Access to Resources and Control in the Field of Fisheries], Havs- och vattenmyndighetens författningssamling, last updated 2017.</p>			

	<p>Förordning (1994:1716) om fisket, vattenbruket och fiskerinäringen [Regulation on on Fisheries, Aquaculture and the Fishing Industry], Svensk författningssamling 1994:1716, t.o.m. SFS 2016:826, last updated 2017.</p> <p>Interviews with representatives of Västra Götaland county administrative board, SFPO, SSPO and individual mussels producers during the site visit.</p> <p>List of inspections and infringements presented to the assessment team by representative of Västra Götaland county administrative board during the site visit.</p> <p>Miljöbalk (1998:808) [Environmental Code], Svensk författningssamling 1998:808 t.o.m. SFS 2018:779.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	95
CONDITION NUMBER (if relevant):	-

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4	<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>		
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	All governmental agencies in Sweden, at both national and regional level, conduct internal reviews annually and must report to their respective ministry by 1 February the following year. If there are suspicions of irregular practice, a more thorough review is carried out. This includes key parts of the management system, so SG 80 is met . It is a principal challenge to claim that all parts of a fisheries management system are subject to review, but it seems reasonable to expect some sort of a formal and holistic evaluation of the system as such to be in place, which is not the case here. SG 100 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	As mentioned under SI 3.2.4a above, all governmental offices in Sweden conduct regular internal review of their working; this is the case also for the various bodies at national and regional level that are involved in the regulation of the mussel industry. SG 60 (at least 'occasional internal review') and the first requirement for SG 80 ('regular internal review') are met. In 2018, a mid-way evaluation of the Plan of Action for the development of Swedish aquaculture was completed. The evaluation is published by the National Board of Agriculture and authored by two staff members of Swedish		

		Aquaculture, which is affiliated with the Board, but it is based on joint review activities with external actors. The second part of the SG 80 requirement is also met ('occasional external review'), but not the SG 100 requirement ('regular internal and external review'). Hence, SG 80 is met.
References		Halvtidsrapportering av handlingsplanen för utveckling av svenskt vattenbruk [Mid-way Reporting on the Plan of Action for the Development of Swedish Aquaculture], Swedish Aquaculture, 2018. Interviews with representatives of Västra Götaland county administrative board and the National Aquaculture Board during the site visit
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		-

Appendix 2 Peer Review Reports

Peer reviewer 1

Summary of Peer Reviewer Opinion

Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	As this fishery formed the great majority (approximately 95%) of the West Sweden SSPO rope grown mussel fishery that was assessed very recently and is now being reassessed due to it having left the SSPO, it is no surprise that I have very few comments. Those that I have made are relatively minor.	Thank you.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]		N/a No conditions raised	No response required
Is the client action plan clear and sufficient to close the conditions raised? [Reference FCR v2.0, 7.11.2-7.11.3 and sub-clauses]		N/a No conditions raised	No response required
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	Yes	Habitat modification on the seabed below and near to the farms and possible contribution to reducing eutrophication of the water column are both discussed.	No response required
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	As a very minor point the CAB may want to mention in the executive summary (and elsewhere in the report?) that there is no need to score genetic outcome PIs as there are no translocations involved.	Thank you, this has been added to the executive summary.

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	CAB Response Code
1.1.1	Yes	Yes	NA	The CAB has correctly identified that scoring of P1 is not required as this fishery is a catch and grow fishery that does not impact the stock.	Thank you.	
1.1.2	Yes	Yes	NA	As above	No response required	
1.1.3	Yes	Yes	NA	The CAB has correctly identified that scoring of P1 is not required as this fishery is a catch and grow fishery that does not impact the stock, and as there are no translocations there is no need to score genetic outcomes under PI 1.1.3	No response required	
1.2.1	Yes	Yes	NA	The CAB has correctly identified that scoring of P1 is not required as this fishery is a catch and grow fishery that does not impact the stock.	No response required	
1.2.2	Yes	Yes	NA	As above	No response required	
1.2.3	Yes	Yes	NA	As above	No response required	

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	CAB Response Code
1.2.4	Yes	Yes	NA	As above	No response required	
1.2.5	Yes	Yes	NA	The CAB has correctly identified that scoring of P1 is not required as this fishery is a catch and grow fishery that does not impact the stock, and as there are no translocations there is no need to score genetic outcomes under PI 1.2.5 & 1.2.6	No response required	
1.2.6	Yes	Yes	NA	As above	No response required	
2.1.1	Yes	Yes	NA	The CAB has correctly identified that scoring of P1 is not required as this fishery is a catch and grow fishery that does not impact the stock.	No response required	
2.1.2	Yes	Yes	NA	As above	No response required	

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	CAB Response Code
2.1.3	Yes	Yes	NA	As above	No response required	
2.2.1	Yes	Yes	NA	As above	No response required	
2.2.2	Yes	Yes	NA	As above	No response required	
2.2.3	Yes	Yes	NA	As above	No response required	

2.3.1	No (no score change expected)	Yes	NA	<p>MSC Guidance suggests that all other MSC certified UoAs that might impact harbour porpoise need to be taken into account for the fishery to achieve a score of 80 in SI 2.3.1a. As a minimum this should include the other local certified rope-grown mussel fisheries although clearly they are subject to the same (zero or close to zero) bycatch, but if the guidance is taken verbatim to its logical conclusion then it may be that all other certified (or in the process) fisheries that affect the harbour porpoise in the ASCOBANS region (to which the 1.7% annual removal limit mentioned in the scoring justification applies) should also be included here.</p>	<p>This has been amended. With regards to the fishery under assessment, impacts on harbour porpoise are non-existent. The same goes for other mussel farms along the Swedish West coast (as described in the PCR for the SSPO Swedish West Coast Rope Grown mussel fishery by CU Pesca, 2019a).</p> <p>As for the impact of other MSC UoAs on harbour porpoise in the Greater North Sea area (North Sea, ICES Subarea 4, and Skagerrak, Kattegat, ICES subarea 3a), the team has looked at the PDCR for the 'Joint demersal fisheries in the North Sea and adjacent waters' assessment (CU Pesca, 2019b), since this is both the most recent analysis of the impact of other MSC UoAs on this species, and covers a large portion of the North Sea fisheries (and all MSC fisheries with a possible impact near the Swedish coastal are, which are set nets). CU Pesca (2019b) identifies set nets as the biggest risk to regional porpoise populations (based on ICES, 2016).</p> <p>Due to the acknowledged uncertainty over the estimated population impact it is not possible to state with a "high degree of certainty" that the set net fisheries are meeting international requirements for the protection of</p>	Accepted (no score change)
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					<p>harbour porpoise in the North Sea. However, based on the best estimates of total mortality it appears “highly likely” that the fisheries are operating within the internationally agreed limits for harbour porpoise mortality. ICES states the percentage fishing mortality over the Greater North Sea Ecoregion is <1.7% as a level stipulated by ASCOBANS as the maximum acceptable total mortality from all activities above which a management response would be required to limit the mortality to which the population is subjected. ICES acknowledges that some uncertainty surrounds its estimate due to unknown bias and a lack of reporting from some nations (ICES, 2016). However, the upper estimate of bycatch mortality was 0.88% and even accounting for some potential bias the assessment team considers it highly unlikely that this estimate would increase by 100% and exceed the 1.7% limit (CU Pesca, 2019b).</p> <p>The fishery therefore meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species. SG 80 is met. However, no research has been identified to</p>	
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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	CAB Response Code
					provide a high degree of certainty for the fishery under assessment, and due to the acknowledged uncertainty over the estimated population impact it is not possible to state with a "high degree of certainty" that the set net fisheries are meeting international requirements for the protection of harbour porpoise in the North Sea, so overall SG100 is not met.	

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	CAB Response Code
2.3.2	Yes	No (no score change expected)		Justification for SI d (management strategy implementation) states that "it is <u>clear</u> that the non-lethal ways of deterring the birds, like putting nets around the farm, and chasing the birds away are implemented successfully, and is achieving its objectives" but then later states that there is <u>no clear evidence</u> (hence not meeting the 100 guidepost). I recommend changing the wording to "there is some evidence....." since this best matches the management strategy to the guidepost. (Alternatively it should be considered that the 100 guidepost is met).	This has been amended to 'there is some evidence', and kept at SG80.	Accepted (no score change)
2.3.3	Yes	Yes	NA		No response required	

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	CAB Response Code
2.4.1	No (no score change expected)	Yes	NA	There is evidence from the maps presented (and also from EMODnet modelled habitats available on-line) that subtidal rocky habitats are relatively widespread in the general inshore area, at least in relation to the very small footprint of the mussel farming. This constitutes additional evidence that the UoA is highly unlikely to reduce structure and function of minor habitats to a point where there would be serious or irreversible harm.	Thank you, this has been added to the rationale.	Accepted (no score change)
2.4.2	Yes	Yes	NA		No response required	
2.4.3	Yes	Yes	NA		No response required	
2.5.1	Yes	Yes	NA		No response required	
2.5.2	Yes	Yes	NA		No response required	

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	CAB Response Code
2.5.3	Yes	Yes	NA		No response required	
2.6.1	Yes	Yes	NA	The CAB has correctly identified that as this fishery is a catch and grow fishery that does not impact the stock, and as there are no translocations there is no need to score genetic outcomes under PI 2.6.1, 2.6.2 & 2.6.3	No response required	
2.6.2	Yes	Yes	NA	As above	No response required	
2.6.3	Yes	Yes	NA	As above	No response required	
3.1.1	Yes	Yes	NA		No response required	
3.1.2	Yes	Yes	NA		No response required	
3.1.3	Yes	Yes	NA		No response required	

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	CAB Response Code
3.2.1	Yes	Yes	NA		No response required	
3.2.2	Yes	Yes	NA		No response required	
3.2.3	Yes	Yes	NA		No response required	
3.2.4	Yes	Yes	NA		No response required	

Peer reviewer 2

Summary of Peer Reviewer Opinion

Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	The information given in the report is very thorough and the scores are generally well justified. Only a few unclarities in some places, as indicated in the PI comments.	Thank you
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]		NA - no conditions raised	No response required
Is the client action plan clear and sufficient to close the conditions raised? [Reference FCR v2.0, 7.11.2-7.11.3 and sub-clauses]		NA - no conditions raised	No response required
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	Yes	The effects of this catch and grow fishery is generally well described and with information that supports the scoring.	Thank you.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A		No response required

Perform ance Indicator	Has all available relevant informat ion been used to score this Indicator ? (Yes/No)	Does the informatio n and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performan ce 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	CAB Response Code
1.1.1			NA	As this is a catch and grow fishery with no translocations, the certifier has decided to not assess against Principle 1. I agree with this approach.	Thank you.	
1.1.2			NA		No response required	
1.1.3			NA		No response required	
1.2.1			NA		No response required	
1.2.2			NA		No response required	
1.2.3			NA		No response required	
1.2.4			NA		No response required	
1.2.5			NA		No response required	

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	CAB Response Code
1.2.6			NA		No response required	
2.1.1			NA	PI 2.1 is not scored as per SB 3.1.1.	No response required	
2.1.2			NA		No response required	
2.1.3			NA		No response required	
2.2.1			NA	PI 2.2 is not scored as per SB 3.1.1.	No response required	
2.2.2			NA		No response required	
2.2.3			NA		No response required	

Perform ance Indicator	Has all available relevant informat ion been used to score this Indicator ? (Yes/No)	Does the informatio n and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performan ce 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	CAB Response Code
2.3.1	Yes	Yes	NA	<p>The information given to support the scoring is detailed and thorough, and it is clear that a lot of work is being done to deter the birds. I therefore agree with the scores given.</p> <p>One minor detail, not related to scoring: The text keeps changing between "the farmer" and "farmers". It is not clear to me whether "the farmer" refers to Scanfjord, or to one specific farm that has been visited, because in a few instances farmer interviews are also mentioned (text example "From discussions with the farmer, and the evidence provided through copies of the Eider Reports, the team has concluded that the likelihood of illegal shootings is very low. The deterring effect realised by shooting the birds is limited, and farmers have found that shooting is generally considered a waste of time and resources, hence the efforts put into alternative means of deterrence".</p>	<p>This has been amended.</p> <p>During the site visit, the team met with Scanfjord only (the farmer), but did verify that other farmers that would make use of the certificate sharing agreement operate in similar ways, so that they are within scope of this assessment. This topic was also important at the SSPO site visit (April 2018), where more farmers were interviewed on the eider duck deterrence (Scanfjord was one of them).</p>	Accepted (no score change)

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	CAB Response Code
2.3.2	Yes	Yes	NA		No response required	
2.3.3	Yes	Yes	NA	There is a good description of information and how it is used.	Thank you	

2.4.1	No (no score change expected)	Yes	NA	<p>One of the issues for this fishery is the lack of site-specific research and monitoring of benthic effects. I think there is given a good description of ongoing studies and how they will be used. However, it should be ensured that studies of these effects are continued and expanded.</p> <p>As for minor habitats, these are defined as rocky bottom. On p. 27 it is mentioned that "Since most of the mussel farms are located in more sheltered areas, these occur near rock and potentially biogenic reefs (see Figure 10 below)". In the scoring rationale there has been given a good description of mitigation of effects, as part of the planning process. However, it would be interesting to know what these biogenic reefs are made of (I would assume <i>Mytilus</i>, but a lot of different biogenic reefs are mentioned in the assessment report)? Also, on p 34 it is mentioned that mapping is very poor, so mitigation seems difficult, or something is a little contradictory.</p> <p>On p 36 it is mentioned that <i>Zostera</i> only occurs on max 6m depth, and the farms are on sites with a depth of at least 7-8 m. I am curious if there is any information whether <i>Zostera</i> used to be distributed to deeper depths, or is the 6 m considered the maximum depth? In many parts of the nordic region, <i>Zostera</i> used to be deeper than the present distribution, probably due to water quality issues and substrate quality. (I don't think these issues will have any implications for scoring).</p>	<p>Thank you. We have confidence that the research projects listed in the report will continue in the coming years, and we will pay attention to this at surveillance audits.</p> <p>As for the biogenic reefs, these are both blue mussels (<i>Mytilus edulis</i>) and Pacific oysters (<i>Crassostrea gigas</i>), according to IVL (pers. Comment Ms Strand). As discussed under PI2.4.3, there is a general sense of habitats distribution, and planning of mussel farms takes this into account. Information on whether certain areas would qualify as Special Areas of Conservation under the EU Habitats Directive (Council Directive 92/43/EEC) was found to be lacking.</p> <p>With regards to <i>Zostera</i>: according to data from the County Administrative Board, eelgrass beds can be found up to 6.3 m deep, but more commonly occur at around 1-4.5 m depth. A theory on the decrease in depth limit (and thus a reduction in area cover of</p>	Accepted (no score change)
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					<p>eelgrass) is that eutrophication caused a phase shift in terms of increasing phytoplankton biomass, followed by a decline in macrophyte cover (see e.g. C. Boström et al, 2014.</p> <p>Distribution, structure and function of Nordic eelgrass (<i>Zostera marina</i>) ecosystems: implications for coastal management and conservation. Aquatic Conservation; and Karlsson, J. 1999.</p> <p>Kungsbackafjordens marina flora: Djuputbredning av makroalger samt utbredning av ålgräs (<i>Zostera marina</i>) och nating (<i>Ruppia maritima</i>) sommaren 1999. Rapport till Miljö- och hälsoskyddskontoret i Kungsbacka kommun)</p>	
2.4.2	Yes	Yes	NA		No response required	
2.4.3	No (scoring implications unknown)	Yes		<p>On p 34 it is mentioned that "With regards to Natura 2000, there are no overlapping areas between mussel farms and Natura 2000 sites, and thus no interaction with Natura 2000 habitats, like submerged sandbanks. However, these sites have mainly been mapped for deeper areas, and information is lacking on shallow near-shore habitats. The need for more benthic mapping in shallow areas is recognised..." The statement seems contradictory to the scoring</p>	<p>With regards to SI 2.4.3a, the team feels the nature, distribution and vulnerability of the main habitats in the UoA area are known at <u>a level of detail relevant to the scale and intensity of the UoA</u>, warranting a score of SG80: The type of habitat that the mussel farms operate in is known. No</p>	Accepted (no score change)

				<p>justification in scoring issue a. It is also unclear whether only designated Natura 200 sites have not been sufficiently mapped, or whether it is a general problem in the coastal areas. Also, are there any plans of further mapping in the coastal area?</p>	<p>mussel culture activities are allowed over sensitive habitats, and hard substrate is avoided. Muddy and sandy habitats are considered the least sensitive to the impacts of mussel culture.</p> <p>However, mainly due to the fact that some stakeholders mentioned that they feel information is lacking on shallow near-shore habitats in general (which came up in the discussion on Natura 2000-sites), we felt it is not clear that the distribution of vulnerable habitats is known <u>in sufficient detail</u> to warrant a score of 100. The main issue seems to be that more benthic mapping in shallow areas is needed in order to determine whether these areas would qualify as Natura 2000-sites. Several parties, among which the University Gothenburg are trying to get research funded for this specific goal.</p>	
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					In light of the Geological Survey of Sweden (SGU) Hallberg et al (2010) state the following: "Substrate maps will continuously be produced in areas SGU surveys in the future. The marine geological maps show the original deposited material and reflect past and present hydrodynamic processes such as bottom currents, wave exposure, sediment-erosion, -transportation and -deposition as well as bathymetry."	
2.5.1	Yes	Yes	NA		No response required	
2.5.2	Yes	Yes	NA		No response required	
2.5.3	Yes	Yes	NA		No response required	
2.6.1			NA	This fishery is without translocations	No response required	
2.6.2			NA	This fishery is without translocations	No response required	
2.6.3			NA	This fishery is without translocations	No response required	

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	CAB Response Code
3.1.1	Yes	Yes	NA		No response required	
3.1.2	Yes	Yes	NA		No response required	
3.1.3	Yes	Yes	NA		No response required	
3.2.1	Yes	Yes	NA		No response required	
3.2.2	Yes	Yes	NA		No response required	
3.2.3	Yes	Yes	NA		No response required	
3.2.4	Yes	Yes	NA		No response required	

Appendix 3 Stakeholder submissions

No formal stakeholder submissions were received.

(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

Table 11. Surveillance level rationale

Level	Rationale
1	<p>The assessment team have determined that the surveillance level for this fishery can be reduced from the default of 6 down to level 1. (i.e. 1 on-site surveillance audits, 2 off-site surveillance audits, and 1 review of information) based on the following rationale:</p> <ul style="list-style-type: none"> • Although this does not formally constitute a re-assessment of the fishery, the client has been part of the SSPO Swedish West Coast Rope Grown mussel fishery since the initial assessment in 2013; and has taken part in surveillance audits and assessments. The client is therefore aware of the information needs at the surveillance stage; • There are no Conditions on Outcome PIs resulting from the reassessment; • The CAB received no stakeholders-concerns; • The CAB has a high degree of certainty that a remote review of information can be done.

Table 12. Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	May 2019	May 2020	N/A as it is proposed that the first surveillance is conducted on the certificate anniversary date.

Table 13. Fishery Surveillance Program

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 1	Review of Information	Off-site surveillance audit	Review of Information	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.

(Reference: FCR 7.19.1)

Appendix 6 Certificate sharing agreement



From: Scanfjord Mollösund AB

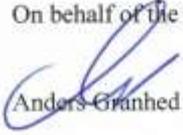
To: Control Union Pesca Ltd

Regarding: Certificate sharing arrangements for the Scanfjord Swedish Rope Grown Mussel Fishery.

Scanfjord Mollösund AB confirms its willingness to share the certificate for the MSC certification of its Scanfjord Swedish Rope Grown Mussel Fishery with Västskustmusslor HB, operating in the same region (West coast Sweden), and using the same technique (suspended mussel culture on ropes, nets or bands). These mussel growers may gain access to the benefits of MSC certification by:

-Agreeing to the fair and equitable sharing of internal and external costs of the certification process and future certification activities (like surveillance audits and re-certification), and
-Agreeing to any practices upon which certification relies, including any conditions and recommendations set for the certification, and the subsequent plans to address these conditions and recommendations.

On behalf of the Scanfjord Mollösund AB


Anders Granhed

Date: 3.11.18

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