

**Marine Stewardship Council (MSC) Public Certification  
Draft Report**

**Netherlands blue shell mussel (translocation, bottom &  
cultured) fishery**

**On Behalf of**

**Vereniging Producentenorganisatie van de Nederlandse  
mosselcultuur (Dutch PO mussel culture)  
the Zeeuwse Hangcultuurkwekers and  
Vereniging van Importeurs van Schelpdieren**

**Prepared by**

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## QA

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## Glossary

Acronym	Definition
AA	Appropriate Assessment
AIS	Automatic Identification System
BB	Big Bag
CAB	Conformity Assessment Body
CFP	Common Fisheries Policy
CU UK	Control Union UK Ltd.
DWS	Dutch Wadden Sea
EC	European Commission
EEZ	Exclusive Economic Zone
EMFF	European Maritime and Fisheries Fund
EU	European Union
FS	Fisheries Standard (MSC)
GiMaRIS	Gittenberger Marine Research Inventory and Strategy
HZ	Hogeschool Zeeland (University of Applied Sciences Zeeland)
IMARES	Institute for Marine Resources & Ecosystem Studies, now Wageningen Marine Research
I&M	Ministry of Infrastructure and Environment (in Dutch: Ministerie Infrastructuur en Milieu)
INNOPRO	Innovatie en Rendementsverbetering Mosselproductie (Innovation and Rentability Improvement Mussel Production)
JMMB	Joint Monitoring of Migratory Birds
LVN	Ministry of Agriculture, Nature, and Food Quality (in Dutch: Ministerie van Landbouw, Natuur en Voedselkwaliteit)
MEC	ME Certification Ltd
MEP	MacAlister, Elliott & Partners Ltd
MSC	Marine Stewardship Council
MWTL	Monitoring Waterstaatkundige Toestand des Lands
NGO	Non-Governmental Organisations
NVWA	Netherlands Food and Consumer Product Safety Authority
MZI	Mosselzaadinvanginstallaties (seed mussel collectors: SMC)
N2000	Natura 2000
NIOZ	Royal Netherlands Institute for Sea Research
OS	Oosterschelde
PCR	Public Certification Report

PO	Producer Organisation
PRODUS	Project Duurzame Schelpdiercultuur (Project Sustainable Shellfish Culture)
PVU	Plan van Uitvoering (Implementation Plan)
RBF	Risk Based Framework
SAC	Special Areas of Conservation
SASI	Schelpdier Afhankelijke Soorten Inventarisatie (Shellfish Dependant Species Inventory)
SIMP	Shellfish Import Monitoring Protocol
SMC	Seed mussel collectors
SPA	Special Protected Area
SST	sea surface temperature
TMAP	Trilateral Monitoring and Assessment Programme
UNCLOS	United Nations Convention on the Law of the Sea
UoA	Unit of Assessment
UoC	Unit of Certification
VD	Voordelta
VIZ	Visserij Initiatief Zeeland
VMS	Vessel Monitoring System
VZHK	Vereniging Zeeuwse Hangcultuurkwekers
WMR	Wageningen Marine Research (formerly IMARES)

# 1 Executive summary

## 1.1 Changes since the Previous Assessment

This fishery is made up of three previously certified mussel fisheries: The Netherlands blue shell mussel fishery, Netherlands suspended culture mussel fishery, and Mussel translocation into the Oosterschelde.

The Netherlands blue shell mussel fishery and Netherlands suspended culture mussel fishery were previously assessed together at the last reassessment in 2016. The fishery was recertified with no conditions or recommendations, and no conditions or recommendations were raised during the annual surveillances (year 1-3). This fishery is included in this reassessment as Units of Assessment (UoAs) 1-4.

The Mussel translocation into the Oosterschelde was first certified on the 27<sup>th</sup> January 2016 by ME Certification (MEC, now Control Union UK – CU UK). The fishery was certified with no conditions or recommendations, and no conditions or recommendations were raised during the annual surveillances (year 1-4). This fishery is included in this reassessment as Unit of Assessment (UoA) 5.

Since (re)certification in 2016, all fisheries within this combined fishery continue to operate in the same way and there have been no major changes in management and traceability.

Please visit previous PCRs (SGS, 2011a and b and Gascoigne et al, 2016a) for a detailed description on the following which have not changed since (re)certification:

- Biology and ecology of *M. edulis*;
- History of the fishery;
- Locations of the culture and re-watering plots, as well as of the suspended culture farms;
- Dutch bottom and suspended culture practices;
- Gear descriptions for mussel dredge and seed mussel collectors (SMCs);
- Bycatch and discarding practices;
- Description of the Wadden Sea and Oosterschelde ecosystem.

The main strengths and weaknesses of the client's operations remain similar to the previous assessments:

The main strengths of the mussel seed fishery (UoA 1-4) are the use of a renewable fast growing-stock in combination with specific spatial limitations imposed upon the fishery in terms of open and closed areas, within which the fishery can operate. The dependence of natural bottom recruitment as seed resource in combination with occasional recruitment failure has initiated the development of alternative seed sources, such as import, and seed mussel collectors (SMCs). Competing claims in the western Wadden Sea of mussel seed fishery and nature conservation of mussel bed habitats has resulted in a transition process to gradually reduce the bottom fishery as a function of alternative seed resource exploitation. There is good management within the seed fishery including seed fishery plans that focus on the exploitation of unstable seed beds in the autumn, in order to retain mussels during the winter. Likewise, both the culture plots, grow-out on rope culture and spat collectors are well managed through the Natura 2000-requirements (either licensed or part of the Natura 2000 management plans).



The fishery is well researched, and the industry continues to cooperate with research institutes to further the knowledge on mussel culture. There is limited interaction with ETP species, and the habitat the fishery operates in is well understood and mapped.

Similarly, the key strengths of the mussel translocation (UoA 5) are a strong regulatory framework, a good scientific base and data collection in use, which provided the assessment team with robust information upon which to base their assessment.

The main present weaknesses of UoA 2-4 are the dependence of natural bottom recruitment for seed supply, which is only partially mitigated through the use of spat collectors (UoA1). For UoA 3 (On-growing of mussels grown using suspended ropes), the lack of site-specific long-term monitoring of (potential) effects underneath the mussel farms is a weakness.

There were no key weaknesses identified by the team regarding UoA 5.

At this CPRDR stage, the team provisionally scored the fishery as meeting the criteria for MSC certification with all Principles likely to achieve an overall aggregate score of 80. No conditions were raised.

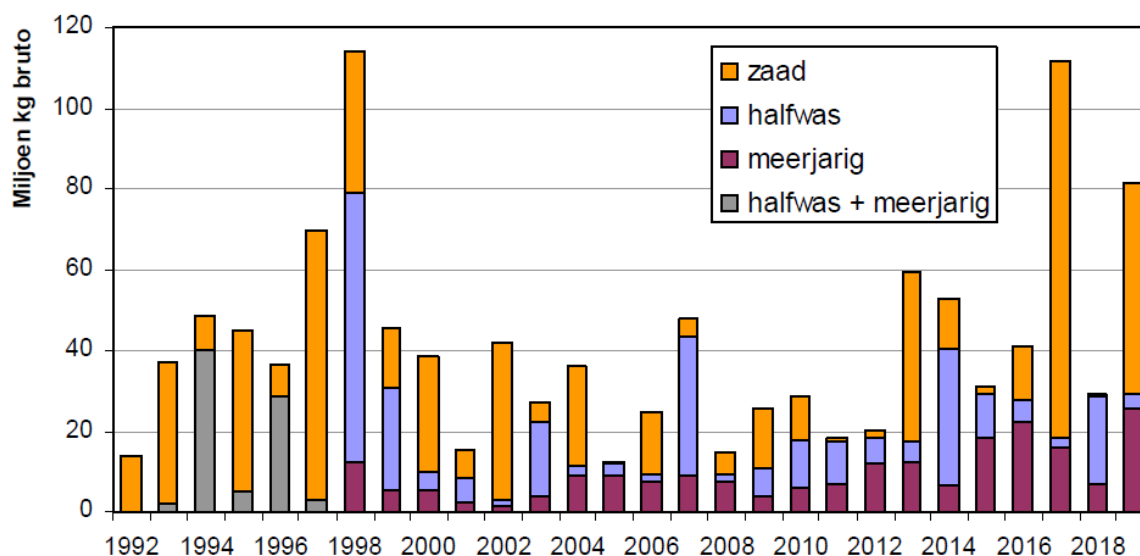
## **1.2 Principle 1**

For Principle 1, only PI 1.1.3 is scored for UoA 5, and Principle 1 is not scored for UoAs 1-4. The evidence for UoAs 1-4 has not changed from the previous assessment. Details on UoA 1-4 can be found in the [Public Certification Report](#) (PCR; Gascoigne et al, 2016a). Some new research has been published on mussel genetics in the Netherlands, which is summarised in Section 6.2.2 and used to score PI 1.1.3. Further details on UoA 5 can be found in the [PCR](#) (Gascoigne et al, 2016b).

As has been customary during the surveillance audits for UoA 1-4, an update on the mussel stock has been included as background information, as wild stocks are surveyed on a scientific basis twice a year (in spring and in autumn). The stock on culture plots is known from a winter/spring biomass survey.

The mussel stock of the Dutch coastal zone can be considered as one stock. The stock includes wild mussel beds (predominantly in the Wadden Sea), mussels on hard substrates like dikes, and mussels on mussel culture plots, both in the Wadden Sea and the Oosterschelde. A considerable part of the annual spatfall is harvested and transferred to the culture plots in both areas, or to the suspended ropes cultures in the Oosterschelde.

During the summer of 2019, no significant spat fall occurred. This led to the decision not to have a spring fishery in 2020. Due to Covid-19, compounded by the fact that there would be very little spat to fish on (based on information from autumn 2019), the spring survey was carried out at a later time, in July 2020. The fishable biomass (mussel spat) was estimated at 2 Mkg live weight (20.000 mussel tonnes, with a mussel tonne being 100 kg). The survey was targeted to spat areas, based on information from shrimp fishers in the area (van Stralen, 2020a). There is no full estimation of the wild stock in the Wadden Sea for 2020.



**Figure 1. The spring survey estimates of wild mussel stock in the Western Wadden Sea, 1992-2019; zaad=seed, halfwas=half-grown, meerjarig=adult (Figure 1 in van Stralen et al, 2019a).**

Some areas in the Western Wadden Sea are closed to the fishery. Closed areas are both littoral sandbanks, permanently closed areas (based on the Shellfish Policy from LNV, 2014) and areas closed as part of an agreement between the fishery, environmental NGOs and the Ministry of Agriculture, Nature and Food Quality (in Dutch: Ministerie van Landbouw, Natuur en Voedselkwaliteit – LNV), which are incorporated in the Implementation Plan for the Transition of the Mussel Industry (Ministerie LNV, 2014a). At the time of the last full survey in 2019, the mussel biomass in the closed areas was estimated at 39.7 Mkg live weight, and 41.9 Mkg of the mussel biomass in the areas open to the fishery. Of the mussels in the open areas, around 35.8 Mkg were available in high enough densities to be fished ( $> 0.15 \text{ kg/m}^2$ ). 34.4 Mkg consists of seed mussels, and 1.4 Mkg of older mussels (van Stralen et al, 2019a). Based on these estimates, a licence was granted for the 2019 spring fishery, for a total of 27.5 Mkg (275.000 mussel tonnes (PO Mossel, 2019a). There was no seed fishery in autumn 2019 nor in spring 2020. Based on the aforementioned survey in July 2020, a licence was granted for the 2020 autumn fishery, for a total of 2 Mkg (20.000 mussel tonnes; Ministry LNV, 2020a).

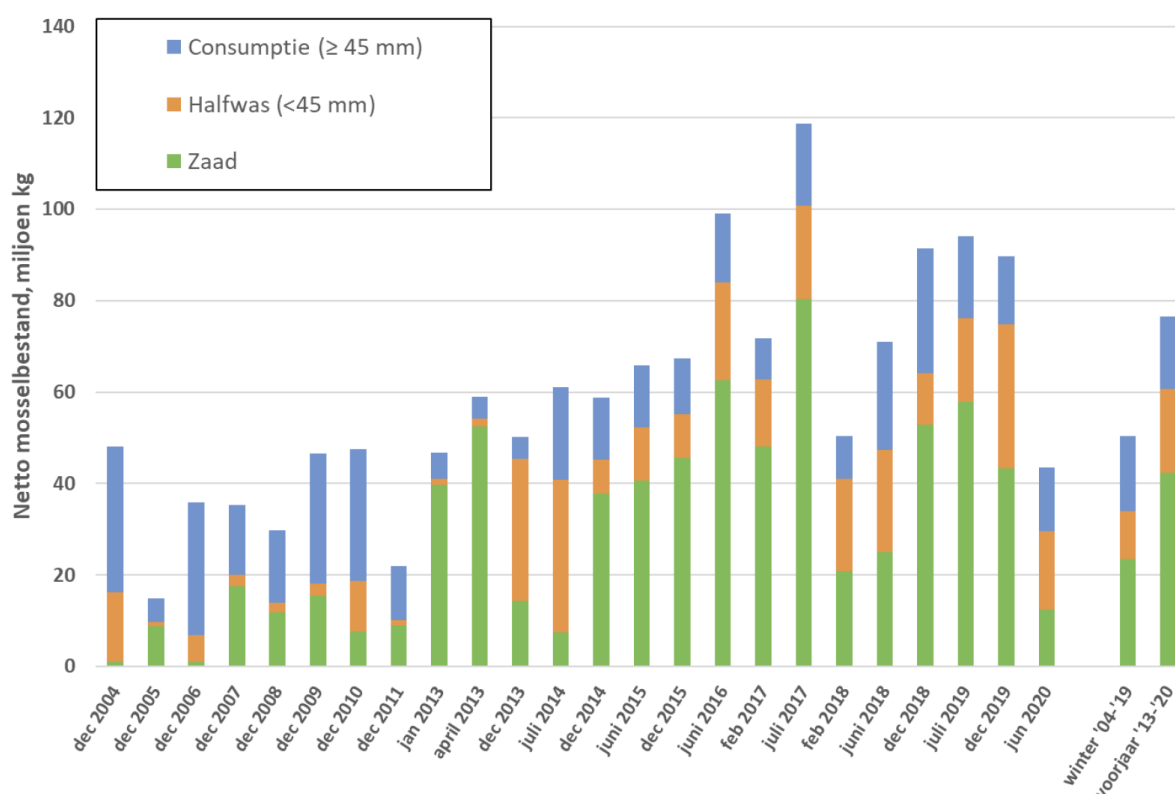
In 2020, 28% of the fishing areas were officially closed because of the mussel agreement, though the PO has implemented the planned 35% closure on a voluntary basis to make the ‘optimisation of the culture plots’ possible. The closure of 35% of the fishing grounds will become official once the optimisation of the culture plots has been realised. The optimisation procedure serves to changes some culture plot-locations, exchanging less suitable plots (mainly due to plots becoming shallower as a result of silting) for new grow-out areas (this is discussed further under section 6.6.2). There has been no change in the amount of plots leased in either the Oosterschelde or the Dutch Wadden Sea. The area used for the grow-out of mussels on ropes (suspended culture) by the members of the Vereniging voor Zeeuwse Hangcultuurkwekers included on the MSC certificate has not changed either since the re-assessment in 2016.

Based on surveys in autumn 2018 and spring 2019, the first wild seed fishery since 2010 has taken place in the Oosterschelde and Voordelta in the spring of 2019. Surveys showed that a total of 50,000 mussel tonnes (5 Mkg) were available in these areas combined (van Stralen, 2019a). Based on the surveys, the PO drafted a fishing plan (PO, 2019b) and a fishing licence was granted by the Ministry of LNV for 2.5 Mkg mussel seed in the Oosterschelde and 2.5 Mkg mussel seed in the Voordelta (2500 mussel ton). However, due to high mortality the amount of seed fished in the Voordelta was only

4.963 mussel tonnes, and in the Oosterschelde so little mussel seed remained that the fishery was replaced by a so-called research fishery. No fishing for mussel spat took place in the Oosterschelde and Voordelta in 2020.

On culture plots in the Dutch Wadden Sea, the June 2020 survey (Capelle and van Stralen, 2020b) estimated the total biomass at 62.1 Mkg live weight. Taking into account the cultch (mainly empty shells) this is 43.5 Mkg nett weight, which is a reduction from the estimated 91.5 MKg in December 2018, and 89.7 MKg in December 2019. The cause of the decline is the loss of mussels as a result of storms, and the fact that there has been no 2020 spring fishery adding mussels to the culture plots.

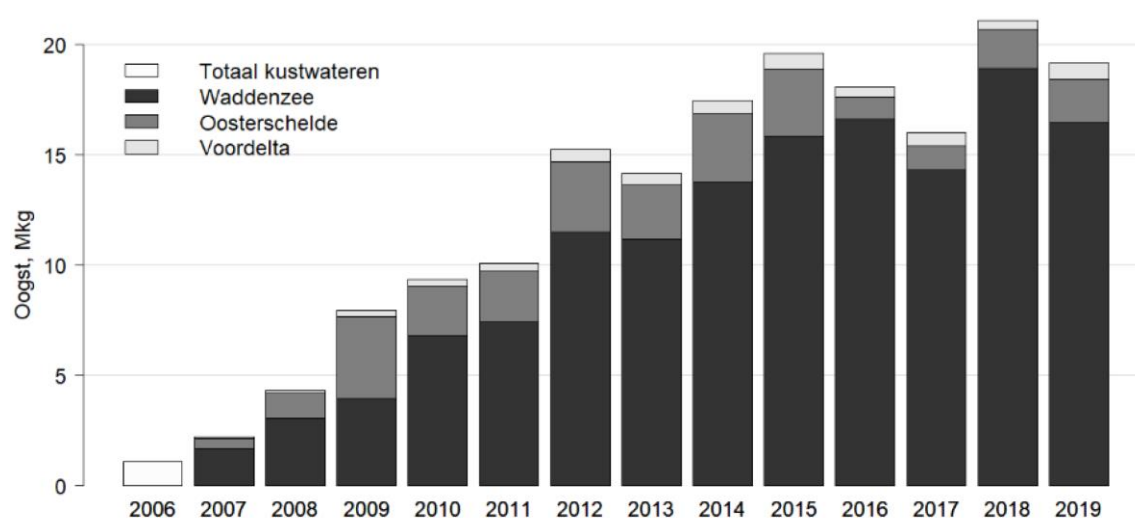
The aim of this survey is to monitor food availability for overwintering birds, taking into account overall stock status in the Dutch Wadden Sea, to support the fishing license for the wild seed fishery in the Wadden Sea. The minimum level of biomass on culture plots required at the end of 2019 was estimated at 31.8 Mkg live weight. Based on the 2019 survey it could be concluded that a sufficient amount of mussels were available for birds in the Dutch Wadden Sea area, with 89.7 Mkg on the plots (Capelle and van Stralen, 2020a).



**Figure 2. The mussel stock on culture plots in the Dutch Wadden Sea in net fresh weight from 2004 to 2020, with the Winter 2004- 2019 and Spring 2004-2020 averages plotted on the right (this is the minimum biomass required on the culture plots for birds). Zaad=seed, halfwas=half-grown, meerjarig=adult (figure 3.2 in Capelle and van Stralen, 2020b).**

The quantity of mussel seed that is cultured on Seed mussel collection by suspended ropes and nets (MZIs) is annually estimated through a survey of production figures of companies that produce mussel spat through mussel seed collectors. Capelle and van Stralen (2020c) estimated that in 2019 a total of 192,000 mussel-tonnes (19.2 Mkg) of mussel seed were produced, 16.5 MKg in the Wadden Sea, 2.1 Mkg in the Oosterschelde and 0.7 Mkg in the Voordelta. This is 11% less than in 2018 in the Wadden Sea, but 28% higher in the Dutch Delta (Oosterschelde and Voordelta), overall 7.5% less than the 2018

yield. The amount of substrate (ropes and nets) used to catch spat remained roughly the same as in 2018, and the decrease was caused by a reduction of spat settlement on the ropes in the Wadden Sea, whereas settlement on the nets was comparatively good (Capelle and van Stralen, 2020c).



**Figure 3. Annual harvest of seed mussels in million kg (Mkg) live weight from MZIs in the Wadden Sea, Oosterschelde and Voordelta since 2006 (Figure 4.2 in Capelle and van Stralen, 2020c).**

### 1.3 Principle 2

There have been no changes to the fishing gear used in either the seed fishery, the SMCs, the bottom culture nor the suspended culture. Likewise, the practices regarding the mussel translocation have not changed.

Throughout 2016-2020, the fishing activities of both the seed fishery, the SMCs, the suspended culture and the translocations have been subject to separate Nature Conservation Licences, which are underpinned by appropriate assessments, determining that the activities are unlikely to impact the Natura 2000 qualifying features in the Dutch Delta and/or the Dutch Wadden Sea.

As of 2016, the management plans for the Oosterschelde Natura 2000 area part of the Deltawateren Beheerplan 2016-2022, and the Natura 2000 management plan for the Dutch Wadden Sea (DWS) 2016-2022 have been finalised. The plans set out *inter alia* the licensing requirements for activities taking place in both areas and removes the need for separate Natura 2000 licences (licences based on the Natura protection act) for some activities, including mussel culture in both the Oosterschelde and the DWS.

The ban on transporting mussels from the Oosterschelde to the Wadden Sea currently remains in place due to the presence of the Japanese oyster drill (*Ocenebra inornate*) in the Oosterschelde, which is a species invasive to the area. Note that this does not affect the SMCs of which the seed can still be imported into the Wadden Sea, since the oyster drill does not have a pelagic phase and cannot occur on rope-caught seed. If this activity is to restart, an appropriate assessment and Nature Conservation Licence will be required.

Finally, as mentioned above, the PO has been looking to optimise the culture plots for its members. This is a drawn-out process with the aim to substitute culture plots that have decreased in quality (e.g. due to sedimentation or changed flow patterns) with new culture plots. The new culture plots will have to be assessed against the Natura 2000 qualifying features. At the end of 2019, an agreement

with most of the PO's members about the relocations was reached, though a few companies made objections. The realisation of the new plots is the final step in the 3<sup>rd</sup> transition phase of the mussel transition agreement (see section 1.4 below for a summary of the agreement and section 6.6.2 for the full update). The Nature licence has been applied for, and the expectation is that the licence will be granted in 2021. Following this, the addendum to the mussel transition agreement, as realised in December 2020, will come into effect.

After the addendum to the original mussel transition agreement was agreed on in December 2020, new SMC-policy was published (Ministry LNV, 2020b). This will allow for a new multi-year licence. At the beginning of 2021, preparations were underway for this licence, but the appropriate assessment was not yet available to the team.

## **1.4 Principle 3**

There are no major changes in the fisheries and in the management systems since reassessment. Natura 2000-management plans that were in draft at the time, have now been implemented, and Province of Zeeland has implemented additional policy regarding the translocation of shellfish. This new policy from the Province of Zeeland means an even more risk-based approach and allows for more control and regulation of all shellfish translocations.

As for the mussel transition agreement with the NGOs, an evaluation of the agreement in 2013 revealed that the 2020 target was not achievable; the stepwise increase in spring mussel bed closures therefore continues. A new agreement (addendum to the original agreement) was reached in December 2020 extending the existing Mussel Transition Agreement from 2008 till 2029:

*from Spring 2021, 36% of the Dutch Wadden Sea will already have been closed to the bottom seed fishery. This will be gradually increased to 50% in 2022 and 65% in 2026. The intent is to achieve a 100% closure by 2029, but only if this is economically viable for the mussel sector. In parallel, another 760 ha will be made available to SMC seed production (with some flexibility in locations to ensure quality can be maintained) with subsidies also provided.*

The addendum also contains wording on how to deal with further delays in closures, including the appointing of a 3-person committee to advise on further steps and the ultimate step of taking the Agreement partners to court.

## 2 Report details

### 2.1 Authorship and peer review details

The assessment team for this assessment consisted of Dr. Jo Gascoigne (P1), Ms Chrissie Sieben (P2), Cora Seip-Markensteijn (P3, Team Leader), and Beverley O’Kane (Traceability).

**Dr. Jo Gascoigne (Principle 1)** is a former research lecturer in marine biology at Bangor University, Wales. She is an expert on fisheries science and management, with over 15 years’ experience as a consultant, working mainly on MSC pre-assessments and full assessments, as well as FIP scoping, planning and implementation. Jo has been involved as expert and lead auditor in the majority of MEP’s, MEC’s and CU Pesca’s full MSC assessments and numerous pre-assessments. She regularly participates in the MSC training sessions and workshops. Jo is a fully qualified MSC Team Leader and has been involved as expert and lead auditor in over 15 MSC pre- and full assessments. She was also involved in previous assessments for this fishery. Dr Gascoigne has recently completed the required Fishery Team Leader MSC training modules for the V2.1 Fisheries Certification Process. In addition, she has also completed the fisheries traceability version 2.0 MSC online training module. Cora meets the Fishery Team Leader criteria in Table PC2. Dr Gascoigne had primary responsibility for the assessment of **Principle 1**.

**Ms. Chrissie Sieben (Principle 2)** has a Master’s Degree in Marine Environmental Protection which she obtained at the University of Wales, Bangor. Until 2019, she was the MSC Fisheries Scheme Manager at CU Pesca and specialised in marine and fisheries ecology, marine environmental impact assessment and sustainable fisheries. She is now an Associate of CU (UK), which allows her to combine her MSC work with a wider range of consultancy projects. Previous to joining CU Pesca, Chrissie worked as a fisheries consultant for MacAlister Elliott and Partners (MEP), where she worked on a number of projects including the application of WWF Common Methodology to wild capture and aquaculture fisheries for the WWF Hong Kong ‘Good Fish Guide’, Sustainable fisheries in the Trilateral Wadden Sea, acted as Fisheries Liaison for the London Gateway Project and carried out socio-economic characterisations and impact assessments of commercial fisheries for coastal developments. Prior to her work at MEP, she worked inter alia as a marine ecologist on environmental impact assessments (EIAs) and completed an internship with the Global Environment Facility / UNDP International Waters Programme. Chrissie is a fully qualified MSC Team Leader with particular expertise in Principle 2 and is involved in MSC full assessments, pre-assessments and fishery surveillance audits. Chrissie participates regularly in MSC CAB training sessions and workshops and has received in-depth Risk-Based Framework training. She has also worked as a Chain of Custody auditor. Cora meets the Fishery Team Leader criteria in Table PC2. Chrissie had primary responsibility for the assessment of **Principle 2**.

**Ms. Cora Seip-Markensteijn (Principle 3 and Team Leader)** acted as Team Leader and with overall responsibility for the assessment and traceability, as well as the primary responsibility for the assessment of **Principle 3**. 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 online fishery team leader training. Cora has also completed MSC traceability training and RBF training in the past 3 years. 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 and shrimp and flatfish fisheries and included the Marine Framework Directive. She was also shellfish Policy Office and worked closely with the Dutch shellfish industry (mainly mussels, but also oysters, Ensis, and cockles). From 2013-2017 and 2020 onwards, 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. From 2017-2019, Cora was a Fisheries Assessment Manager for CU Pesca, and her experience covers MSC surveillance audits (P2 and P3), and fishery assessments (P2 and P3).

**Ms. Beverley O’Kane (traceability)** joined CU Pesca (now CU UK) as a Fisheries Officer in late 2019. She has a strong background in the fisheries sector and marine sector. Prior joining CU she was involved in marine and environmental consultancy and seafood sustainability, conducting research on English inshore fisheries management and global tuna fisheries. She is experienced in assessing the sustainability of global fisheries using UK and U.S. standards and methodologies, including Seafish, Marine Conservation Society and Monterey Bay Aquarium. Her experience is focused on elasmobranch and shellfish species, particularly on stock status and management principles. She has lived and worked in the fisheries sector in Norway, Ireland and the U.S, including on a shellfish boat in Irish waters. In 2015, Bev completed an MSc in International Marine Environmental Consultancy from the Newcastle University, during which she completed modules on fisheries governance and management and conducted a thesis on the sustainability and management of a ray fishery. Beverley has completed the required Fishery Team member MSC training modules for the new V2.2 Fisheries Certification Process, along with the RBF (Table PC3.7) and Traceability training (Table PC3.6). Beverley is responsible for the traceability part of the assessment.

None of the team members have a Conflict of Interest in relation to the fishery under assessment.

#### **Peer Reviewers:**

The MSC Peer Review College compiled a shortlist of potential peer reviewers to undertake the peer review for this fishery. Two peer reviewers were selected from the following list:

- Julian Addison
- Terence James Holt

**Dr Julian Addison** is an independent fisheries consultant with 30 years’ experience of stock assessment and provision of management advice on shellfish fisheries, and a background of scientific research on shellfish biology and population dynamics and inshore fisheries. Until December 2010 he worked at the Centre for Environment, Fisheries and Aquaculture Science (Cefas) in Lowestoft, England where he was Senior Shellfish Advisor to Government policy makers, which involved working closely with marine managers, legislators and stakeholders, Government Statutory Nature Conservation Organisations and environmental NGOs. He has also worked as a visiting scientist at DFO in Halifax, Nova Scotia and at NMFS in Woods Hole, Massachusetts where he experienced shellfish management approaches in North America. For four years he was a member of the Scientific Committee and the UK delegation to the International Whaling Commission providing scientific advice to the UK Commissioner. He has worked extensively with ICES and most recently was Chair of the Working Group on the Biology and Life History of Crabs, a member of the Working Group on Crangon Fisheries and Life History and a member of the Steering Group on Ecosystems Function. He has extensive experience of the MSC certification process primarily as a P1 team member but also as a P2 team member and team leader, undertaking MSC full assessments for the Newfoundland and Labrador snow crab fishery, the Ireland and Northern Ireland bottom grown mussel fisheries, both the Estonia and Faroe Islands Barents Sea cold water prawn fisheries, the Nephrops fishery in the Skagerrak and Kattegat, separate assessments for the Swedish, Danish and Norwegian Skagerrak and Norwegian Deep cold water prawn fishery, the Eastern Canada offshore lobster fishery and the Limfjord mussel and cockle fisheries. He has also undertaken MSC pre-assessments, numerous annual surveillance audits and has carried out peer reviews of MSC assessments in both Europe and North America of lobster, cold water prawn, razorfish, cockle and scallop fisheries. Other work includes a

review of the stock assessment model for blue crabs in Chesapeake Bay, USA, and an assessment of three Alaskan crab fisheries under the FAO-based Responsible Fisheries Management scheme.

**Dr Terence James Holt** is an independent marine environmental consultant, 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.

## 2.2 Version details

**Table 1. Fisheries program documents versions**

Document	Version number
MSC Fisheries Certification Process	Version 2.2
MSC Fisheries Standard	Version 2.01
MSC General Certification Requirements	Version 2.4.1
MSC Reassessment Reporting Template	Version 2.2



### 3 Unit(s) of Assessment and Certification and results overview

CU UK confirms that the fishery under assessment is within the scope of the MSC Fisheries Standard (7.4 of the MSC Fisheries Certification Process v2.2):

- 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 convicted for a shark finning violation in the last 2 years;
- The client or client group does not include an entity that has been convicted for a forced or child 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 an enhanced fishery as per the MSC FCP 7.4.6 (for further details, see below); and
- The fishery is not an introduced species-based fishery as per the MSC FCP 7.4.7.

CU (UK) confirms that the client group has submitted the completed 'Certificate Holder Forced and Child Labour Policies, Practices and Measures Template' prior to the start of this assessment, and that the client group does not include an entity that has been convicted for a shark finning violation in the last 2 years.

The proposed Unit of Assessment (UoAs) are given in Table 2 and Table 3.

#### 3.1 Unit(s) of Assessment and Unit(s) of Certification

##### 3.1.1 Unit(s) of Assessment

**Table 2. Units of Assessment (UoA) 1-4**

<b>Species and stock</b>	European / blue shell mussel ( <i>Mytilus edulis</i> )
<b>Geographical range</b>	FAO area 27 North Sea The Wadden Sea (ICES division 4b) and Zeeuwse delta (ICES division 4c) of the Dutch coastal region
<b>Gear type</b>	<u>UoA 1</u> : Seed mussel collection by suspended ropes and nets (or <i>mosselzaad-invanginstallaties</i> , SMCs, in Dutch) in the Oosterschelde, Wadden Sea and Voordelta  <u>UoA 2</u> : Seed mussel collection by mussel dredge (' <i>mosselkor</i> ') in the Wadden Sea and Oosterschelde  <u>UoA 3</u> : On-growing of mussels grown using suspended ropes, collection of harvest size mussels from suspended ropes by Zeeuwse

	<p>Hangcultuurkwekers in Zeeland (Oosterschelde, Voordelta, Veerse Meer and Grevelingenmeer)</p> <p><u>UoA 4</u>: Seeding mussel seed and half grown mussels on culture plots, collection of harvest size mussels from culture plots by dredging in the Wadden Sea and Oosterschelde</p>
<b>Management Systems</b>	The management system - both EU and national level - is subject to law, observes the legal and cultural rights of fishermen and includes transparent mechanisms for dispute resolution. Fishing plan for seed mussels is written by the Producers' Organisation (PO) for Mussel Culture.
<b>Client group</b>	Vereniging Producentenorganisatie van de Nederlandse mosselcultuur (Dutch PO mussel culture) and Vereniging Zeeuwse Hangcultuurkwekers (VZKH)
<b>Other eligible fishers</b>	none

**Table 3. Unit of Assessment (UoA) 5**

<b>Species</b>	European / blue shell mussel ( <i>Mytilus edulis</i> )
<b>Geographical area</b>	FAO area 27 North-west Europe
<b>Gear type</b>	Dredge/ rope grown
<b>Management systems</b>	Dutch management system for control of impacts of translocation of mussels into the Oosterschelde
<b>Client group</b>	Members of the Vereniging van Importeurs van Schelpdieren
<b>Other eligible fishers</b>	none

### 3.1.2 Unit(s) of Certification

The information discussed at the site visit has not led to any changes in the proposed UoAs. The UoC and other eligible fishers at the time of certification remain unchanged from the proposed UoA described in section 3.1.

### To be completed at Public Certification Report stage

#### 3.1.3 Client groups

During the reassessment of the bottom culture fishery in 2016, the PO included 88 members with 63 vessels. The PO currently has 90 members, with 57 vessels based in Yerseke, Bruinisse and Zierikzee. All of the PO members carry out bottom culture, with plots in the Oosterschelde (OS) and DWS, and several members also hold membership of the Vereniging Zeeuwse Hangcultuurkwekers (VZKH).

The suspended culture fishery was initially certified with four members as part of the VZHK. At the start of reassessment, a fifth member was added to the Unit of Certification on the basis that the additional member was deemed to have a negligible impact on the pre-existing UoC (see for full rationale Gascoigne et al, 2016a).

A full list of vessels and members included in the UoAs will be published with the MSC certificate upon recertification. The lists of members included in the current certificates have been kept up-to-date during the surveillance audits as well.

### 3.1.4 Scope of assessment in relation to enhanced fisheries

The fishery has been defined as an enhanced fishery of the ‘catch and grow’ (CAG) type, with some habitat modifications. Seed mussel is harvested from various areas and relayed onto on-growing plots (‘lays’). Further details on the source of mussel seed and location of mussel plots are provided in Table 4. 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 spat from the wild environment. *Mytilus edulis* is native to the geographic region of the fishery (Wadden Sea and Dutch Delta), and the spat collected comes from natural spat fall. Spat is either fished from wild beds or collected through spat collectors (SMCs). These make use of floating devices that provide a surface area (ropes or nets) for the wild mussel spat to settle and grow on (Catch and Grow). The grow-out of the mussels takes place on either culture plots (bottom culture) or suspended ropes and are grown out within the same geographic region as they are caught.

The collection of spat on SMCs and further on-growing on suspended ropes is also an enhanced fishery of the type HM (Habitat Modified). Natural mussel spat normally settles 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 4. MSC scope criteria for enhanced fisheries.**

<b>A</b>	<b>Linkages to and maintenance of a wild stock</b>
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>B</b>	<b>Feeding and Husbandry</b>

<b>A</b>	<b>Linkages to and maintenance of a wild stock</b>
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.
<b>C</b>	<b>Habitat and ecosystem impacts</b>
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: <ul style="list-style-type: none"> <li>Habitat modifications that are not reversible, are already in place and are not created specifically for the fishery shall be in scope. This includes: <p>Large-scale artificial reefs. Structures associated with enhancement activities that do not cause irreversible harm to the natural</p> </li> </ul>

## 3.2 Assessment results overview

### 3.2.1 Determination, formal conclusion and agreement

To be drafted at Final Draft Report

To be completed at Public Certification Report

### 3.2.2 Principle level scores

Table 5. Summary of Performance Indicator level scores

Principle of the Fisheries Standard	UoA 1	UoA 2	UoA 3	UoA 4	UoA 5
Principle 1 – Stock status	n/a	n/a	n/a	n/a	80.0
Principle 2 – Minimising environmental impacts	88.7	88.7	88.7	88.7	91.6
Principle 3 – Effective management	93.5	93.5	91.0	93.5	91.0

## 4 Traceability and Eligibility

### 4.1 Eligibility date

Pending the successful outcome of this evaluation, the eligibility date for this fishery has been set as the date of certification,. Product caught by Vereniging Producentenorganisatie van de Nederlandse mosselcultuur (Dutch PO mussel culture) and listed members of the Vereniging Zeeuwse Hangcultuurkwekers will be eligible to enter further chains of custody. Mussels imported from other MSC certified fisheries can remain MSC certified upon translocation and will be eligible to enter further chains of custody as well.

## 5 Traceability within the fishery

The traceability in either of the now combined fisheries (The Netherlands blue shell mussel fishery, Netherlands suspended culture mussel fishery, and Mussel translocation into the Oosterschelde) has not changed since the (re)certification in 2016. The details of the traceability system can be found in Gascoigne et al, 2016a and Gascoigne et al, 2016b, and are summarised below for completeness.

At the time of harvesting, either from bottom culture plots or from the suspended culture, a registration document is completed. Information on this document includes vessel, date of harvest, destination of the mussels, quality status of the production area and position of the harvest area (fishing ground). This forms the basis of the traceability. Each registration document has its own, sequential number which is transferred onto subsequent documents, such as the invoice. One registration document will never have mussel harvests from two different fishers, so it is always possible to trace the mussels back to an individual vessel, plot and fisher.

Rope-grown mussels are sold prior to harvesting as the fishers know approximately the volume of mussels they have on the ropes (based on the length of rope, number of ropes places and density of the growth on the ropes). Once the mussels are harvested, they are put onto third-party transport vehicles to go for further processing, which includes weighing of the load at a weigh bridge, so the registration documents reflect how much is really sold. Ownership has changed hands by the time the mussels are loaded onto the transportation. The transport company thus acts as an agent for the buyer and takes no ownership of the mussels.

Bottom culture mussels, once harvested, are sold through the auction at Yerseke. The ships arrive in harbour, or big bags with mussels are transported from Harlingen (harbour at the Wadden Sea) to Yerseke, and a sample of the mussels is taken into the auction.

Due to current Covid-19 restrictions, the auction process is no longer open to the public. Moreover, batches are currently mostly delivered to the companies in Yerseke in big bags, allowing the vessels to stay in the Wadden Sea and not having to travel back-and-forth. The big bags are transported by a third independent transport company, that takes care of the weighing at the weigh bridge. The big bags are labelled by the fisher and kept separate on the transport vehicle. Big bags are sampled upon arrival in Yerseke by employees of the mussel auction, similarly to the loads on board the vessel. All transactions are still completed by the auction, thus guaranteeing that all sales are sampled and registered.

At the auction, the amount of mussels in the harvest is determined, as is the catch-composition: if brought into the auction in big bags, the weight-documentation from the weigh bridge is logged. When

the mussels are in the loading bay of the vessel, the total volume of the loading bay for each vessel is known, and each bay has volume indicators. The volume of mussels in the loading bay is calculated to overall mussel tonnage (with one mussel tonne being 100 kg) with an industry-agreed 1 m<sup>3</sup> of mussels being 700 kg.

As sample is taken at random from the load by the auction employees. The mussels in the sample are counted, measured, and sorted by size (of which there are six size classes) and the percentage of cultch (other material, mostly empty shells, but sometimes also other shellfish or growth on the mussels) is determined, so the buyer can get a clear idea of what he would be buying. This is also used to calculate the net volume of mussels in the loading bay.

Since summer 2020, the samples are not only analysed by hand, but photos of the sample are also taken and provided to (potential) buyers. This allows the sampling process to be done with no audience of buyers present (prohibited due to Covid-19 restrictions), and still given buyers a good sense of the make-up of the harvest. The photos can also be analysed for overall cultch-composition, as has been done for Principle 2 (see section 6.4.4).

All mussels are sold on a sample basis. Only the sample leaves the vessel/ big bags and is not sold. Ownership changes the moment the mussels are sold at auction. Due to logistical reasons, they remain aboard the vessel they were fished with, or on the truck. Once auctioned, the mussels are brought straight to the factories or the relaying plots in the Oosterschelde.

It is also possible for bottom culture mussels to be sold directly, without being offered up for auction. The auction maintains the role of administrator and will provide the harvest registration documentation. The last few years, direct sales have become more commonplace.

The harvest registration document number is written on the customer invoice. The sales note shows the weight of the mussels sold (kg and mussel tonne), percentage of cultch, region of origin (Wadden Sea, plot number) and the MSC certification number. All Dutch mussels from bottom culture are covered by the MSC fisheries certificate.

The sales documents are kept indefinitely by the auction, since 1985 the documents are kept digitally, and the information can be made available by the auction for research purposes, market prognoses and quality analysis over time. The auction itself uses the information to improve upon the service to the fishers and buyers.

Imported mussels are all delivered to the buyers directly, by third party transport (again, not taking ownership of the mussels).

If mussels have been imported from other MSC sources, when they are relayed on the plots in Yerseke, the following information is documented in addition to the list above:

- Plot number of the plot where the mussels have been relayed in the Oosterschelde;
- Date, vessel name, registration document number;
- The amount of mussels fished from the plots.

When the mussels are 'landed' in Yerseke (i.e. when the transport vehicle arrives), they have to provide the Import Organisation (again through the auction, which serves as the administrator) with the bill of lading, registration documents, and any other relevant documents (like the MSC fishery

certification number). This maintains the paper trail, allowing the tracing of the imports back to their respective sources. In order to notify the Import Organisation of the mussel imports, most companies use the registration form. The client group members are also obliged to keep their own administration documentation, all of which the processing companies also have copies, these include:

- Point of origin: name of the production area where the mussels are from (if possible with plot number and/or GPS-coordinates);
- Amount of mussels in tonnage;
- Time and date of arrival in Yerseke;
- Time and date of the notification to the auction;
- Date of the mussels leaving the factory.

This information is kept by both the buyer and the auction for at least 7 years, as prescribed by the Natura licence for the mussel import.

Both the Nature Conservation licences from the Ministry of LNV and the new policy from the Province of Zeeland (see section 6.6) require that the Mussel auction (on behalf of the control authority) is notified of each imported lot for which a SASI is needed, and that documentation is provided (including registration documents and transport documents). To make this easier, the website of the mussel auction has been adapted, and now includes a 'members-only' part, through which traders can notify the auction of the details of an incoming shipment and register all documentation.

The system above allows for full traceability to be maintained from arrival of the mussels to the point of harvest. Mussels are identifiable back to a certified source, through to a specific relocation plot and through to harvest. All mussels that have been relayed and harvested will go to processing factories for packaging for onward sale to the final consumer, i.e. restaurants and supermarkets.

### To be completed at Public Certification Report

**Table 6 – Traceability within the fishery**

Factor	Description
Will the fishery use gears that are not part of the Unit of Certification (UoC)?  If Yes, please describe: If this may occur on the same trip, on the same vessels, or during the same season; How any risks are mitigated.	No. There isn't the possibility of non-certified gear to be used within the fishery, due to the nature of the fishery, which is plot and location-specific. Documentation is in place to know which plots and companies are MSC and which are not.
Will vessels in the UoC also fish outside the UoC geographic area?  If Yes, please describe: If this may occur on the same trip; How any risks are mitigated.	No, all possible areas for this fishery to take place for the respective clients in the client group are included in the UoC, so they never fish outside of the area already defined by the assessment. The fishing areas are restricted based on Fishery Law and Natura 2000 regulations (including specific licenses).
Do the fishery client members ever handle certified and non-certified products during any of the	No, this does not occur in the fishery. There is no processing by the fishery client members, processing occurs further on in the process and is covered by CoC.

Factor	Description
<p>activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.</p> <p>Transport Storage Processing Landing Auction</p> <p>If Yes, please describe how any risks are mitigated.</p>	<p>During processing the risk of mixing non-certified and MSC mussels is present as the non-MSC certified companies may use factories for processing their harvest which also process MSC certified mussels. This however is mitigated by the fact that mussels are processed on a batch-by-batch basis, and therefore MSC and non-MSC mussels are not being processed and potentially packaged at the same time, i.e. physical and temporal separation is employed by the factory (which are also CoC certified). Traceability paperwork from processing is capable of tracing back to the supplier company.</p> <p>At sea: vessels only operate within the unit of certification, so all mussels landed by the bottom culture are certified. Points of landing: Yerseke, Harlingen and the dock at Neeltje Jans at the barrier in the Oosterschelde.</p> <p>Rope mussels can also be landed at their respective locations and put on lorries to Yerseke. Rope mussels are certified based on companies' participation through the VZHK, and either are fully MSC or non-MSC, there is no risk of mixing between companies.</p> <p>Labelled in transport if by land: The big bags are transported by a third independent transport company, that takes care of the weighing at the weigh bridge. The big bags are labelled by the fisher and kept separate on the transport vehicle. By boat, the vessel will only transport its own cargo to the factory to be processed.</p>
<p>Does transshipment occur within the fishery?</p> <p>If Yes, please describe: If transshipment takes place at-sea, in port, or both; If the transshipment vessel may handle product from outside the UoC; How any risks are mitigated.</p>	<p>No. All transshipment operations in EC waters are prohibited and may only take place in designated ports in EU Member States subject to authorisation from the relevant authorities. In any case, transshipment does not take place in the fishery. Mussels are purchased by the customer, before they are either processed by the factories or harvested from the relaying beds. These factories have separate Chain of Custody (CoC). If not processed directly, they are placed on relaying plots of the trading companies ("wet warehouses") and harvested in due course.</p>
<p>Are there any other risks of mixing or substitution between certified and non-certified fish?</p> <p>If Yes, please describe how any risks are mitigated.</p>	<p>No, all risks are discussed above.</p>

## 5.1 Eligibility to enter further chains of custody

### To be completed at Public Certification Report

The following products have been determined eligible to enter further certified chains of custody as MSC certified and carry the MSC ecolabel; blue mussels (*Mytilus edulis*) caught by vessels owned by the client group in the UoAs listed in Table 2 and Table 3. The vessels will also be listed on the certificate.



As mentioned above, change of ownership occurs at slightly different points for suspended and bottom cultured mussels. For suspended cultured mussels ownership changes prior to harvest from the ropes. For bottom culture, ownership changes whilst the mussels are still onboard the fishing vessel or the transport vehicle and its sample has been sold through either the Dutch Mussel Auction in Yerseke, or sold directly (with the auction still taking care of the administrative parts). In both cases, mussels are delivered after sales for onward processing. Separate Chain of Custody certification is therefore required from that point onwards.

The client group appears to have a robust system to manage the import and onward sale of MSC certified mussels. Full traceability paperwork is kept, allowing full tracing of the fishery product being sold to customers, back to MSC fishery from which they originated.

Further chain of custody certification will be required for certified product at the first point of sale (either directly at the point of landing or through the auction).

## 5.2 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to enter further chains of custody

There are no IPI stocks in this fishery.

# 6 Scoring

## 6.1 Summary of Performance Indicator level scores

Table 7. Performance Indicator level scores

Principle	Component	Wt	Performance Indicator (PI)		Wt	Score (per UOA)					
						1	2	3	4	5	
One	Outcome	0.33	1.1.1	Stock status	1	N/A				N/A	
			1.1.2	Stock rebuilding							
	Genetics	0.33	1.1.3	Genetics						80	
	Management	0.67	1.2.1	Harvest strategy	0.25						
			1.2.2	Harvest control rules & tools	0.25						
			1.2.3	Information & monitoring	0.25						
			1.2.4	Assessment of stock status	0.25						
Two	Primary species	0.2	2.1.1	Outcome	0.33	100				N/A	
			2.1.2	Management strategy	0.33	100					
			2.1.3	Information/Monitoring	0.33	100					
	Secondary species	0.2	2.2.1	Outcome	0.33	80					
			2.2.2	Management strategy	0.33	80					
			2.2.3	Information/Monitoring	0.33	80					
	ETP species	0.2	2.3.1	Outcome	0.33	90					
			2.3.2	Management strategy	0.33	80					
			2.3.3	Information strategy	0.33	80					

Principle	Component	Wt	Performance Indicator (PI)		Wt	Score (per UOA)				
						1	2	3	4	5
	Habitats	0.2	2.4.1	Outcome	0.33	80	100	80	100	
			2.4.2	Management strategy	0.33	85				
			2.4.3	Information	0.33	95				
	Ecosystem	0.2	2.5.1	Outcome	0.33	100	80	100	80	
			2.5.2	Management	0.33	85				
			2.5.3	Information	0.33	95				
	Translocation	0.2	2.6.1	Outcome	0.33	N/A				100
			2.6.2	Management	0.33					95
			2.6.3	Information	0.33					80
Three	Governance and policy	0.5	3.1.1	Legal &/or customary framework	0.33	100				
			3.1.2	Consultation, roles & responsibilities	0.33	95				
			3.1.3	Long term objectives	0.33	100				
	Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	90				
			3.2.2	Decision making processes	0.25	85				
			3.2.3	Compliance & enforcement	0.25	100	100	80	100	80
			3.2.4	Monitoring & management performance evaluation	0.25	80				

## 6.2 Principle 1

### 6.2.1 Principle 1 background UoAs 1-4

For the previous assessment, the analysis concluded that for UoAs 1-4, there is no impact on the stock from the activities of the fishery. Therefore, following the requirements of SB2.1.4 MSC Fisheries Standard V2.01, Principle 1 is not required to be scored for these UoAs.

The evidence for this has not changed from the previous assessment. In line with the requirements of SB2.1.4.1, it is summarised below. For additional detail, the reader is referred to the previous [PCR](#) (Gascoigne et al., 2016a).

#### UoA 1 (seed collection by SMCs):

Seed collection on SMCs does not have any impact on wild stocks, because the limiting factor for mussel seed is not recruitment, but rather availability of suitable settlement habitat. This is clear because the SMCs (plus other artificial habitat such as mooring lines, harbour walls etc.) are immediately colonised by mussels. Since the SMC provide additional habitat their only possible impact is to enhance the wild stock.

It was concluded in Gascoigne et al. (2016a) that movement of seed from SMCs between the Delta and the Wadden Sea does not constitute translocation between separate ecosystems, because the

two systems are likely to be connected oceanographically, and because movement of mussels from the Wadden Sea to the Delta has been systematic for many decades.

Nothing has changed in the fishery to alter these evaluations. Therefore, it is concluded that Principle 1 is not required to be scored for UoA1.

#### UoA 2 (seed collection by mussel dredge):

It was concluded in the previous assessment (Gascoigne et al., 2016a) that the collection of mussel seed from sub-tidal seed beds by dredge has no impact on the parent stock, because subtidal seed beds are known to be ephemeral in nature, and rarely persist. They are lost to predation (mainly starfish) and/or storms. The seed mussels are relaid on culture plots in more stable areas and will spawn at least once before harvest.

Since the initial certification, Japanese oyster drill (*Ocenebra inornate*), a non-native gastropod, has been found in the Oosterschelde, resulting in a ban on movement of dredged mussels (any size) from the Oosterschelde to the Wadden Sea, to avoid introducing the species to the Wadden Sea. The ban does not apply to SMCs (UoA1) because the oyster drill does not have a planktonic larval phase and cannot colonise the SMCs in mid-water. This means that seed harvested in the Oosterschelde currently cannot be re-laid on culture plots in the Wadden Sea, but the reverse is possible. Relaying of mussels from the plots in the Oosterschelde on culture plots in the Wadden Sea is subject to a licensing procedure (similar to the procedure described in section 6.4.5 (and several scoring issues under Principle 2).

Aside from stricter rules about movements from Oosterschelde to Wadden Sea, nothing has changed in the fishery to change the evaluation of MSC requirements. Therefore, it is concluded that Principle 1 is not required to be scored for UoA 2.

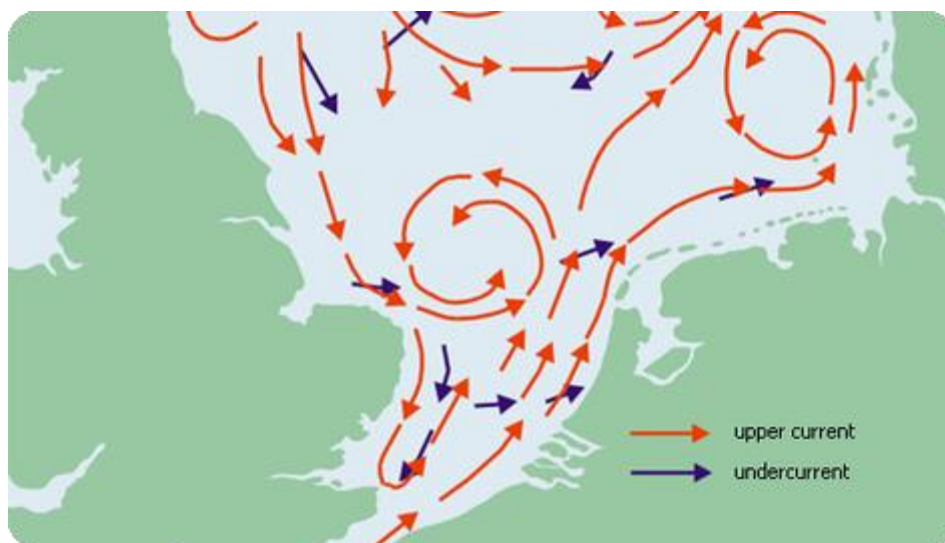
UoA 3 (ongrowing and harvest of mussels on suspended ropes): As noted above, the mussels on suspended ropes are supplementary to the natural stock, since settlement habitat is a limiting factor for mussel larvae settling out of the plankton. Therefore, by definition this activity can only add to the stock. Hence Principle 1 is not required to be scored for UoA3.

UoA 4 (seeding, ongrowing and harvest of mussels on culture plots): As noted above, mussels harvested from seed beds on to culture plots are likely to be supplementary to the natural stocks, since the subtidal seed beds on which harvest takes place do not persist. Mussels on these seed beds may sometimes persist long enough to spawn once (since first spawning can be at age <1) but mussels on the culture plots will spawn several times before harvest. Similarly, seed harvested from (SMCs) can be relayed on culture plots for on-growing. As discussed under UoA 1, the SMC provide additional habitat and their only possible impact is to enhance the wild stock. Hence Principle 1 is not required to be scored for UoA4.

UoA 5 (translocation of mussels into the system from elsewhere in NW Europe): Mussels are moved around within the Dutch Wadden Sea (DWS) and within the Delta area and brought in from MSC certified fisheries across NW Europe. As outlined in Gascoigne et al (2016a), it is clear that the movement within the Dutch waters does not constitute a translocation since it is within the same ecosystem. Movement from the DWS to the Delta has been going on for many years, since most of the seed beds and the culture plots for the early stages are in the DWS, but mussels may be moved to the Oosterschelde for the final growth stage. This movement can be regarded as equivalent to mussel harvest for a fishery taking place only in the DWS – the argument above applies in relation to the impact of the fishery on the parent stock in the DWS. Licensing of movement from the Delta to the

DWS is more recent and started in 2012. It is a consequence of the Transition Agreement (see Section 6.6), since SMCs positioned in the Delta are of limited use to the fishery unless the seed collected on them can be relayed on the on-growing plots in the DWS. Since there is negligible fishing of natural seed in the Delta (very occasionally in the Voordelta), this movement of SMC mussels to the DWS has no impact on the natural stock in the Delta.

The current system along the Dutch part of the North Sea coast runs from the southwest to the northeast (Figure 4), hence strong connectivity would be expected between the Delta and the DWS. In the opposite direction, as noted above, movement of mussels has been a common practice for many decades. Hence there is strong connectivity in both directions, whether natural or manmade.



**Figure 4.** Current systems in the southern North Sea (see <http://www.ecomare.nl/en/encyclopedia/natural-environment/water/water-currents/sea-currents/>)

The ecosystem and genetic consequences of the movement of mussels in the wider context of import of mussels into the Oosterschelde from MSC-certified fisheries further afield, is the focus of UoA 5. This translocation is into the system under assessment here, so clearly these translocated mussels add biomass to the system. Mussels are only brought into the fishery under assessment from MSC certified mussel fisheries (see Section 5 Traceability), so the removal of mussels from those systems is assessed elsewhere. For this ‘catch and grow’ fishery, it is determined (Gascoigne et al., 2016b) that PI 1.1.3 (genetics) (previously 1.1.4, genetic outcome) is required to be scored for UoA 5.

## 6.2.2 Mussel translocation and genetics (UoA 5)

### Sources of mussels coming into the system:

The most recent information that CU has at present as to sources of translocated mussels comes from the Year 4 Surveillance Audit report (April 2020) – presented below and has been checked at the site visit:

- Ireland bottom-grown mussels (Ireland)
- Ireland rope grown mussel (Ireland)
- Northern Ireland bottom-grown mussels (Northern Ireland, UK)
- North Menai Strait mussels (Wales, UK)

- DFPO Inner Danish Waters blue shell mussels (Denmark)
- Limfjord blue shell mussel (rope grown) (Denmark)
- DFPO Limfjord Mussel and Cockle Fishery (Denmark)
- Seafood Romo East Jutland and Isefjord blue-shell mussel dredge (Denmark)
- Germany lower Saxony mussel dredge and culture (Germany)
- Schleswig-Holstein blue shell mussel (Germany)
- Havsodlarna Swedish West Coast Rope grown mussel (Sweden)
- Scanfjord Swedish Rope grown mussel (Sweden).

#### Genetics of mussels in NW Europe:

Three species of *Mytilus* occur in NW Europe, of which two are relevant here: *M. edulis* and *M. galloprovincialis* ('edulis' and 'gallo'). Note that the species are more or less indistinguishable by eye and totally indistinguishable in terms of their population dynamics and ecology.

The two species hybridise in zones where they are both present. (Many researchers regard them as subspecies – *Mytilus edulis edulis* and *M. galloprovincialis*.) The previous [PCR](#) for UoA 5 (Gascoigne et al., 2016b) provides details of their distribution, but in summary gallo was previously native to the Mediterranean and the west coast of Spain and France, while edulis was native to the English Channel and North Sea. With climate change, gallo is moving north and east, and an extensive hybrid zone occurs from Brittany around the Channel, South Wales and the west coast of Ireland and Scotland, although the Irish Sea and the North Sea remain mainly edulis for the moment; it is thought because edulis tolerates low winter water temperatures better. This distribution is, however, likely to change as sea surface temperature (SST) continues to increase: the hybrid zone on the north coast of Brittany expanded eastwards by ~110 km between 1997-2007 (Hilbish et al. 2012). Based on a winter minimum for gallo of ~10°C and current (at the time) climate models, they predicted that by 2050 the hybrid zone will extend well into the southern North Sea.

#### Genetics of mussels in the Oosterschelde:

Translocated mussels are re-laid in the Oosterschelde for a relatively brief period before final harvest. Most will not have the opportunity to spawn in the Oosterschelde, although some may.

The previous PCR reported (based on the information available at the time) that despite translocation of mussels into the system since the 1960s, there was relatively little evidence of gallo genetic material in wild populations in the Oosterschelde; it was estimated that ~1% of the population has some gallo alleles. Since then a larger study has been published (Gittenberger 2016) (mentioned as forthcoming in the previous PCR) which found larger proportions of gallo markers in populations of mussels in the Netherlands. While proportions of mussels with gallo alleles in samples from the Oosterschelde and Wadden Sea were low overall (~5%), samples from some areas showed that >50% of mussels were gallo or hybrids.

The study did not find any significant changes in allele frequency with previous samples, in areas which had been sampled previously. The author hypothesises that these gallo mussels were not previously detected because sampling was confined to areas that have strong tidal currents and did not include areas that are relatively protected from tidal influence. This includes the Grevelingen,

where they found that two thirds of the mussels were hybrids and a quarter were homozygous gallo, as well as calmer parts of the Oosterschelde such as the Slaak and the Veerse Meer.

### 6.2.3 Total Allowable Catch (TAC) and catch data

There is no Total Allowable Catch (TAC) for this fishery. The production data for the different UoAs are presented in Table 8. Note that in the Netherlands, mussel biomass is expressed in “mosseltonnen” (mussel tonne), with one mussel tonne equating 100 kg.

**Table 8. Production Data in the Netherlands Blue Mussel Fisheries (UoA 1-4). Data presented are in mussel tonnes (i.e. x 100kg)**

Period	UoA 1: MZIs	UoA2: wild seed fishery	UoA 3: suspended culture	UoA 4: bottom culture
2014/2015	174,600	200,000	19,438	579,320
2015/2016	181,000	241,160	24,295	402,941
2016/2017	160,000	673,032	16,000	526,726
2017/2018	207,000	346,800	16,391	438,860
2018/2019	192,000	200,263	13,879	492,872
2019/2020	Not yet available	39,000	Not yet available	Not yet available

As discussed in section 6.2.1, following the requirements of SB2.1.4 MSC Fisheries Standard V2.01, Principle 1 is not required to be scored for UoAs 1-4.

Nevertheless, wild stocks are surveyed on a scientific basis twice a year (in spring and in autumn). The stock on culture plots is known from a winter/spring biomass survey. The results of these surveys were discussed during the surveillance site visits and are summarised in section 1.2 for completeness.

Mussels brought in from NW Europe as part of the translocation (UoA 5) are from MSC certified mussel fisheries (see Section 5 Traceability), and harvesting is covered by the aforementioned source and end fisheries. No catch data are therefore presented here.

### 6.3 Principle 1 Performance Indicator scores and rationales

#### 6.3.1 PI 1.1.3 – Genetics : UoA 5 – translocation of mussels from other MSC mussel fisheries into the Oosterschelde

Note: as discussed under section 6.2, only PI1.1.3 needs to be scored

PI 1.1.3		The fishery has negligible discernible impact on the genetic structure of the population		
Scoring Issue		SG 60	SG 80	SG 100
a	Genetic impact of enhancement activity			
	Guidepost	The fishery is unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.	An independent peer-reviewed scientific assessment confirms with a high degree of certainty that there are no risks to the genetic structure of the wild population associated with the enhancement activity.
	Met?	Yes	Yes	No
	Justification	<p>Following the previous assessment (Gascoigne et al., 2016b), ‘serious or irreversible harm’ in this context is taken to mean:</p> <ul style="list-style-type: none"> <li>genetic change resulting in ecological change to wild population such that their dynamics or role in the ecosystem or use as prey is compromised;</li> <li>loss of genetic diversity compromising their ability to adapt to current and future environmental change.</li> </ul> <p>Current evidence (summarised in Section 6.2.2 above) suggests a low level of <i>gallo</i> alleles present in the predominantly <i>edulis</i> population in the Oosterschelde, but with some areas having higher levels of <i>gallo</i>. Gittenberger (2016) hypothesises that this is because of differences in habitat preference, with <i>gallo</i> doing better in areas of low tidal influence (not the case in most of the Oosterschelde). Given the report’s finding of genetic differences on a relatively fine spatial scale based on habitat (which has also been found on the west coast of Ireland) (Gosling &amp; Wilkins 1981), it may be that the genetic composition of mussels in other areas thought up till now to be ~100% <i>edulis</i> needs to be re-evaluated on a finer spatial scale.</p> <p>Gittenberger (2016) notes that it is not possible to say how long <i>gallo</i> has been present in the Oosterschelde, nor how it got there, but that there is no evidence of any genetic change based on re-sampling of areas previously sampled. There is no evidence that the presence of <i>gallo</i> genetic</p>		

		<p>material could compromise the dynamics of the wild population, or reduce their role in the ecosystem – and it is hard to think of a mechanism by which this could occur. Hybrid populations present elsewhere (SW England, Brittany) show no evidence of differences in growth, spawning etc (as a function of temperature and food supply) and play an identical ecological role. The presence of <i>gallo</i> alleles most likely increases genetic diversity, and there is evidence (Hilbish et al. 2012) that <i>gallo/edulis</i> hybridisation may be a feature of climate change adaptation of mussel populations in NW Europe. <b>SG60 and SG80 are met.</b></p> <p>In relation to SG100, while it seems clear that there is no risk from the arrival in <i>gallo</i> in the system, we do not have all the details regarding the genetic structure of mussels in the Oosterschelde to assign a ‘high degree of certainty’ to our knowledge of the situation. <b>SG100 is not met.</b></p>
References	Gascoigne et al. 2016b; Hilbish et al. 2012; Gittenberger 2016; Gosling & Wilkins 1981	
Draft scoring range	>80	
Information gap indicator	Information sufficient to score PI	
Overall Performance Indicator scores added from Client and Peer Review Draft Report		
Overall Performance Indicator score	80	
Condition number (if relevant)	-	



## 6.4 Principle 2

### 6.4.1 Fishery survey data availability

A number of monitoring schemes currently take place in the DWS and the OS on wild mussel beds and culture areas; these were considered by the team for the scoring of particularly Principle 2. For clarity, a summary is presented below. The responsible entity/entities are put in brackets:

- Spring shellfish survey (Ministry / Wageningen Marine Research -WMR): For all shellfish species, for the purpose of shellfish licence applications, in the DWS and parts of Delta.
- Wild seed bed surveys (PO): Autumn survey of unstable beds to determine where to fish; spring survey revisiting fished beds (part of licence application).
- Culture plots (PO): Spring biomass survey (also sometimes estimates biomass of crabs and starfish)
- SMCs (PO): Annual monitoring of area and production
- SASI (Ministry / Gimares): Biennial survey of all the species on the culture plots, for comparison with imported mussels (Oosterschelde)
- Appropriate assessments: Biennial assessments under the Natura 2000 regulations, to accompany license applications (PO)

Furthermore, there is PRODUS (Project Duurzame Schelpdiercultuur / Project research sustainable shellfish culture) which ran from 2006 to 2012. The project was financed by the ministry of Agriculture, Nature and Food Quality (LNV) and the shellfish sector and was carried out by the Wageningen University & Research (IMARES, now WMR), with the main aim of contributing to sustainable shellfish culture. More specifically, the project examined the effects of the wild seed fishery on the ecological values of the subtidal in the Dutch Wadden Sea and focused on the following key questions:

- Examine the development of multi-year subtidal mussel beds and ecosystem functioning in the absence of a wild seed fishery;
- What are the effects of the wild seed fishery on spat fall in later years?
- What are the current ecological characteristics of the subtidal area?
- What are the ecological differences between culture plots and wild mussel beds?

A summary of the findings of the study is available in the PRODUS final report (see Smaal et al., 2013).

A recent, multi-annual project (2017-2019) commissioned by the PO, called INNOPRO (Innovatie en Rendementsverbetering Mosselproductie) studied factors that influence the rentability of mussel culture. Here WMR, HZ (University of Applied Sciences Zeeland), Royal Netherlands Institute for Sea Research (NIOZ) and Deltares looked at density-dependent survival of mussel spat on the culture plots, predator-control (e.g. through the use of the starfish mop, see section 6.4.4) and optimising the placement of spat collectors based on larval density (Capelle et al., 2020).

From 2016-2020 Wageningen Marine Research Yerseke carried out a research program (KOMPRO) for the PO. KOMPRO has four pillars:

1. Biomass surveys (as discussed in section 1.2);

2. Possible influences of mussel culture on nature: this covers research on sediment-whirls caused by mussel fishery. The results from the Probus-research (discussed in detail in Gascoigne et al, 2016a) are also being turned into scientific publications;
3. Increase in mussel culture efficiency, focussing on how mussel seed should be 'sown'-on the culture plots, to avoid mortality and create a higher yield.
4. Provide a helpdesk-function for mussel growers.

The monitoring of areas closed to the mussel fishery and open to the fishery has been carried out since 2015 (Troost et al, 2019a) and will at least continue till 2024. The monitoring so far does not show significant differences between open and closed areas.

There has also been research done into survivability of mussel beds (how old do the beds get) in littoral areas. The average age of a littoral mussel bed is 3.4 years, with only 15% of mussel beds surviving the first 5 years, after which survivability gets higher (van der Meer et al, 2019). A research proposal to carry out the same study in the sublittoral areas is being drafted.

Also, a study to determine the carrying capacity of the ecosystem in the Wadden Sea and the Oosterschelde, the main shellfish culture areas, has been conducted (Jansen et al., 2019) to answer the question whether the carrying capacity for these areas has been reached. The current data shows no indications that either the productivity of the areas or the available food for filter feeders are negatively impacted, and there is no overgrazing (Jansen et al., 2019).

Finally, a study to accompany the optimisation of the culture plots (see section 1.3) is being carried out. The baseline measurement (T0), before the plots are realised, has been taken to get an idea of the substrate, benthic communities, and fish populations in the area. Once the new plots have been realised, the changes to the areas will be monitored. A reverse study into the old plots that will be decommissioned is not planned for.

#### 6.4.2 Translocation UoA (UoA 5)

This UoA concerns the translocation of mussels into the Oosterschelde from MSC certified mussel fisheries in The Netherlands, Denmark, Germany, UK and Ireland (Section 6.2.2). The source mussel fisheries are currently MSC certified and all aspects of these fisheries, up to and including the point of harvest have therefore already been assessed against the MSC standard. This UoA therefore covers the translocation activities only and no fishing activities are assessed.

The destination fishery in the Oosterschelde (i.e. where the mussels are being translocated to) is also MSC certified and is being reassessed as part of this reduced reassessment. All aspects of this fishery, from the collection of mussel seed using suspended ropes and nets and dredges, to the grow out phase on culture plots in the Oosterschelde and subsequent harvesting are assessed under UoAs 1 - 4, as discussed in the following sections.

For Principle 2, the translocation UoA was assessed as follows:

**Table 9. Principle 2 assessment structure for translocation UoA. Note this approach follows the approach used for the initial assessment of this UoA (Gascoigne et al., 2016b).**

Component	Comment
2.1 – Primary species	Not assessed for this UoA. Impacts of source fisheries assessed under separate MSC fisheries (Section 6.2.1). The culture plots where
2.2 – Secondary species	

2.3 – ETP species	translocated mussels are re-laid are no different from the plots assessed as part of the destination fisheries assessed under UoA 4 in this reassessment.
2.4 – Habitats	
2.5 – Ecosystem	
2.6 - Translocation	Impacts of translocation activities on all ecosystem components are assessed as part of 2.6.

The key risk associated with translocation activities is the introduction of non-native species into the Oosterschelde. To manage this risk, a Shellfish Import Monitoring Protocol (SIMP) was developed by GiMaRIS (Gittenberger 2015), which consists of a three-yearly SASI (Shellfish-dependent species inventory), i.e. a species inventory of samples taken *in situ* at the source fishery, combined with a 'Big Bag' species inventory (BB), involving sampling of the Big Bags of mussels upon arrival in Yerseke (before relaying into the Oosterschelde). For the BB inventory, 2-3 samples per region per import were taken at the time of initial assessment – since then, however the sampling protocol has been revised and sampling is now carried out for 2.5% of all imports from a given source fishery<sup>1</sup>. Currently, this still equates to roughly 2-3 samples per source region. The sampling is being carried out from January-June and July-December, the results of which feed into a risk-based assessment process, which can stop imports or can increase (or reduce) the level of sampling in response to the perceived risk of undesirable introductions. Undesirable in the context of the SIMP is where a species is considered to negatively impact the Natura 2000 conservation goals for the Oosterschelde and poses a risk as an invasive species new to the Dutch waters. The results are also sent to the Ministry of LNV as part of the import licence conditions (see below). Within the SIMP, there is a provision in the event where an undesirable species is detected for a certain source area, but imports from this area have occurred up to 3 months prior to this detection, then the plots where those mussels were re-laid have to be fished clean, with all organisms disposed of to prevent re-entry into the Oosterschelde (Gittenberger 2015). Since the initial assessment, none of the species identified in the SASIs and BBs have been considered to be problematic for the Oosterschelde; this has been documented in the surveillance reports for this fishery.

In addition to the SIMP, each translocation activity requires a Nature Conservation (Natura 2000) licence from the Ministry of LNV. This is because the Oosterschelde is a Natura 2000 site designated as both a Special Area for Conservation (SAC) under the EC Habitats Directive and a Special Protection Area (SPA) under the EC Birds Directive. As a part of the licence application process, an Appropriate Assessment (AA) has to be carried out which consists of a risk assessment derived from the SIMP (SASIs and BBs) for each source area. Each licence is valid for four years. In 2018, the licences for several Irish and UK areas (Exmouth, Glengarriff, Morecambe Bay, Swansea Bay, Waterford Harbour and Youghal Bay: licence nr: DGAN-NB/18148570), as well as the Danish area of Jutland (licence nr: DGAN-NB/18148384) were renewed, with the licence for River Dee (UK) renewed in 2019 (licence nr: DGNVLG / 19029669). No sanctions have been issued or licences withdrawn since the initial assessment.

The impact of the UoA on the translocation component is further discussion in the Principle 2 scoring tables (Section 6.5).

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<sup>1</sup> Note that sampling is not limited to Big Bags. In the event where imported mussels do not arrive in a Big Bag, they are subject to the same sampling regime.

### 6.4.3 Designation of species under Principle 2

For all UoAs except the translocation UoA, the Principle 2 assessment was carried out against the five P2 components of the default assessment tree, as follows:

**Primary** species (MSC Component 2.1) are defined as follows:

- 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) are defined as follows:

- 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

**Habitats** (MSC Component 2.4): Habitats impacted by the fishery, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates, including any commonly encountered habitats, Vulnerable Marine Ecosystems (VMEs) or minor habitats.

**Ecosystem** (MSC Component 2.5): Those key ecosystem elements considered most crucial to giving the ecosystem its characteristic nature and dynamics, to maintaining the integrity of its structure and functions, and the key determinants of the ecosystem resilience and productivity. The key ecosystem elements are considered relative to the scale and intensity of the UoA.

#### **6.4.4 Primary and Secondary species**

##### **UoA 1 - Seed mussel collection by suspended ropes and nets (Oosterschelde, Wadden Sea and Voordelta)**

For the Oosterschelde (OS) and Voordelta (VD), a periodic inventory is conducted of all species present on seed mussel collection installations (SMCs), in order to provide a point of comparison with the species list from mussel plots from which mussels are imported into the OS from elsewhere (e.g. the UK, Ireland, Denmark), with the purpose of ensuring that no undesirable species are introduced into the OS (these are the SASIs as already explained in Section 6.4.2), but also to manage any risk associated with the relaying of mussel seed collected from SMCs in the OS and VD, into the Wadden Sea. The most recent SASI for SMCs in the OS and VD was in 2018 (Gittenberger et al. 2018) and follows previous SASIs carried out in 2012, 2014, 2015, 2016 and 2017. The SASI identified 81 species associated with the mussels on the SMCs, 22 of which were non-native, although none of these were considered as 'problematic' in the context of Natura 2000 management. The 81 species included 41 species of algae, 3 annelids, 8 sea squirts, 3 bryozoans, 5 cnidarians, 10 crustaceans, 2 echinoderms, 4 molluscs, 1 teleost (butterfish – *pholis gunnellus*) and 4 sponges. Although no such inventory is made for SMCs in the Wadden Sea, it is reasonable to assume that the species list will be more or less the same (see discussion under Section 6.2.1). Species taken as 'bycatch' when mussels are harvested from the SMCs will be relaid onto the culture plots or in the 'socks' in the case of suspended culture, so any direct mortality as a result of the seed mussel collection is considered negligible.

Note that none of the species listed by Gittenberger et al. (2018) are protected under the EC Habitats Directive.

##### **UoA 3 - On-growing of mussels grown using suspended ropes, collection of harvest size mussels from suspended ropes (Oosterschelde, Voordelta, Veerse Meer and Grevelingenmeer)**

A study by Gimaris (Gittenberger et al., 2015a) found 56 species associated with the mussels in the 'socks', of which the most significant in terms of biomass are barnacles (*Balanus crenatus* and *Elminius modestus*), tunicates (*Asciidiella scabra*, *Asciidiella aspersa* and *Styela clava*), slipper limpets (*Crepidula fornicata*), seaweed and sometimes common starfish and common shore crabs, i.e. the same species as found associated with the SMCs (see above). Although the Risk-Based Framework (RBF) was announced for the assessment of Secondary species outcome (2.2.1) for this UoA, discussions at the site visit indicated that, besides mussels, there are few other species associated with these installations, and certainly not in quantities that would qualify them as 'main' species. Note also that larger crabs or starfish will not be present as the installations do not come into contact with the seabed. All stakeholders present at the meeting agreed that a RBF on 'main' species was not required. Minor species, which include seaweed and small invertebrates such as bryozoans, tunicates and small crustaceans (see Gittenberger et al. (2015a) for a species list), were not assessed further with the RBF.

##### **UoAs 2, 4 - Seed mussel collection from wild beds and harvest size mussel collection from culture plots by mussel dredge (Wadden Sea and Oosterschelde)**

Since both the wild seed beds and the culture plots represent transient mussel beds in the same ecosystem, it is reasonable to assume that the bycatch will be the same for each. A SASI was conducted

on the culture plots in the OS in 2015, giving a list of 118 species present: 25 non-native; 40 species of algae, 18 crustaceans, 8 cnidaria (anemones, hydroids and jellyfish), 14 molluscs, 4 polychaetes, 8 tunicates, 9 fish, 6 echinoderms, 5 bryozoans, 1 sponge, 2 chelicerates (sea spiders) and one bootlace worm (Gittenberger et al. 2015).

There have been no SASIs completed yet for the Wadden Sea (WS), the logic being that movement of mussels from plots in the WS to plots in the OS has been happening for many years. However, one of the components of the PRODUS project (Section 6.4.1) examined macrozoobenthic biodiversity on wild seed beds and culture plots in the Dutch WS (Dekker & Drent 2013). The study identified a total of 123 species of zoobenthos associated with mussels: 49 polychaetes, 28 crustaceans, 21 molluscs including 16 bivalves, 7 cnidaria, 5 bryozoans, 6 echinoderms and 3 tunicates.

None of the species listed in either the SASI or the PRODUS study are protected under the EC Habitats Directive for the sites concerned.

Unlike in some mussel fisheries, there is no attempt in this fishery to sort out the bycatch prior to relaying on the culture plots. Stakeholders present at the site visit confirmed that all bycatch relaid onto the culture plots consists of species that are robust and opportunistic (e.g. common starfish (*Asterias rubens*), European green crab (*Carcinus maenas*) and Pacific oyster (*Crassostrea gigas*)). Before mussels are re-laid on empty culture plots, or when there is heavy starfish predation on a plot, they may be 'cleaned' of starfish by dragging heavy strips of fabric over the bottom – this 'velcros' up the starfish, which can then be disposed of in the subtidal away from the culture plots. During harvesting, the mussels are first rinsed with seawater to remove any larger organisms such as starfish and crabs. These are returned to the water instantly with high probability of survival. After harvesting, the mussels, together with the bycatch, are brought to the auction. An analysis of 2020 auction data carried out by the Dutch mussel auction shows that on average, the 'tara' component amounted to 17.2% of the total weight of mussel batches brought to auction; this includes empty shells, stones, as well as other invertebrates. Amongst the latter, 1.13% of the total amounted to barnacles (*Balanidae* spp.) and 0.1% to slipper limpets (*Crepidula fornicata*). On that basis, no 'main' species were identified. Although the Risk-Based Framework (RBF) was announced for the assessment of Secondary species outcome (2.2.1) for this UoA, stakeholders present at the site visit agreed that no RBF on 'main' species was required. Minor species were not assessed further with the RBF.

#### **6.4.5 ETP species**

The main group of ETP species that are relevant to this assessment are birds, which are protected under the EC Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds) with designated Special Protected Areas (SPAs) and marine mammals which are protected under the EC Habitats Directive (Directive 92/43/EEC) with designated Special Areas of Conservation (SACs). Both SPAs and SACs are part of the Natura 2000 (N2000) network of sites of ecological importance. All of the UoAs in this assessment (except for the translocation UoA) take place in N2000 sites, as listed in Table 10. All N2000 areas in The Netherlands are designated by the Minister of Agriculture, Nature and Food Quality (Ministry LNV, Department Nature & Biodiversity), and managed by their respective competent authorities, mainly the Provinces, but in some cases the Ministry of Infrastructure and Environment (Ministerie Infrastructuur en Milieu: I&M).



**Table 10. Overview of Natura 2000 sites relevant to this assessment, together with the bird, marine mammal and fish species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC.**

Natura 2000 site	Birds	Marine mammals	Fish
Oosterschelde SPA and SAC (NL3009016)	42 species (see <a href="#">N2000 site</a> )	<ul style="list-style-type: none"> <li>Harbour seal (<i>Phoca vitulina</i>)</li> <li>Grey seal (<i>Halichoerus grypus</i>)</li> <li>Harbour porpoise (<i>Phocoena phocoena</i>)</li> </ul>	Twait shad ( <i>Allosa fallax</i> )
Veerse Meer SPA (NL9802025)	21 species (see <a href="#">N2000 site</a> )	N/a	N/a
Voordelta SPA and SAC (NL4000017)	30 species (see <a href="#">N2000 site</a> )	<ul style="list-style-type: none"> <li>Harbour seal (<i>Phoca vitulina</i>)</li> <li>Grey seal (<i>Halichoerus grypus</i>)</li> <li>Harbour porpoise (<i>Phocoena phocoena</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Twait shad (<i>Allosa fallax</i>)</li> <li>Allis shad (<i>Alosa alosa</i>)</li> <li>River lamprey (<i>Lampetra fluviatilis</i>)</li> <li>Sea lamprey (<i>Petromyzon marinus</i>)</li> </ul>
Grevelingen SPA and SAC (NL4000021)	38 species (see <a href="#">N2000 site</a> )	<ul style="list-style-type: none"> <li>Harbour seal (<i>Phoca vitulina</i>)</li> <li>Grey seal (<i>Halichoerus grypus</i>)</li> </ul>	N/a
Waddenzee SPA (NL9801001) and SAC (NL1000001)	48 species (see <a href="#">N2000 site</a> )	<ul style="list-style-type: none"> <li>Grey seal (<i>Halichoerus grypus</i>)</li> <li>Harbour seal (<i>Phoca vitulina</i>)</li> <li>Harbour porpoise (<i>Phocoena phocoena</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Twait shad (<i>Allosa fallax</i>)</li> <li>River lamprey (<i>Lampetra fluviatilis</i>)</li> <li>Sea lamprey (<i>Petromyzon marinus</i>)</li> </ul>

For birds, there is a long list of protected species, all of which can be seen via the links in Table 10. De Vlas et al. (2014) set out the quantitative goals for each of these and evaluated whether they are being met, and if not, why not. Shellfish fisheries were only identified as an issue for two species: the common eider duck (*Somateria mollissima*), listed in the Voordelta and Waddenzee SPAs, and oystercatcher (*Haematopus ostralegus*), listed in the Oosterschelde, Voordelta, Grevelingen and Waddenzee SPAs, with both species experiencing population declines (Roodbergen & Teunissen 2019; Cervencil et al. 2015). The oystercatcher feeds exclusively in the intertidal (where none of the UoAs operate) and only cockle hand-raking was identified as a potential fishery-related issue for the species. Oystercatchers were therefore not retained as a scoring element for this assessment. The potential impacts of the UoAs on the common eider duck, as well as the ETP marine mammals, is further discussed in the ETP species scoring tables (Section 6.5). Given that mussel fishery impacts on shads and lampreys are not considered a problem (e.g. see de Mesel et al. (2009)), ETP fish species were not considered as scoring elements.

#### 6.4.6 Habitats

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 FS v2.01). 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 FS v2.01).

The MSC FS v2.01 requires habitats interacting with the fishery to be defined as ‘commonly-encountered’, ‘Vulnerable Marine Ecosystem (VME)’ or ‘minor’. With respect to VMEs, there are several important considerations regarding the MSC’s VME habitat requirement that were clarified through the MSC Interpretations website (<https://mscportal.force.com/interpret/s/global-search/VME>):

- It is not the responsibility of an assessment team to identify habitats as VME within the fished area. Instead, VMEs need to be identified by a local, regional, national, or international management authority/governance body.
- The history of fishing and when the VME was identified is critical to establishing what the ‘unimpacted level’ is; if a VME was already impacted by any fishery/UoA prior to its identification as a VME, and fishing impacts occurred prior to 2006, then the ‘unimpacted level’ is considered to be the status at the point of designation<sup>2</sup>.

Commonly encountered habitats are sedimentary sandy and muddy habitats that may overlap with the SMCs and suspended culture sites. Maps of the habitats encountered are available from the Natura 2000-management plan for the specific site (see Figure 6 as an example, for the other areas these maps can be found through the links in Table 10), and in the case of the Wadden Sea through a new project mapping the whole of the Wadden Sea in more detail (Figure 5). The sand, mud, muddy sand and sandy mud commonly encountered habitats under assessment can therefore be summarised as shown in Table 11.

**Table 11. Summary of commonly encountered habitats in this assessment. SGB: Substratum/Geomorphology/Biota (see Table GSA6 in MSC Standard v2.01).**

Commonly encountered habitat	SGB habitat nomenclature
Sand, mud, muddy sand and sandy mud	<ul style="list-style-type: none"> <li>• Fine (mud, sand)</li> <li>• Flat</li> <li>• Small erect/ encrusting/ burrowing</li> </ul>

<sup>2</sup> Note: The year 2006 was chosen because it is the date of the UNGA Resolution 61/105



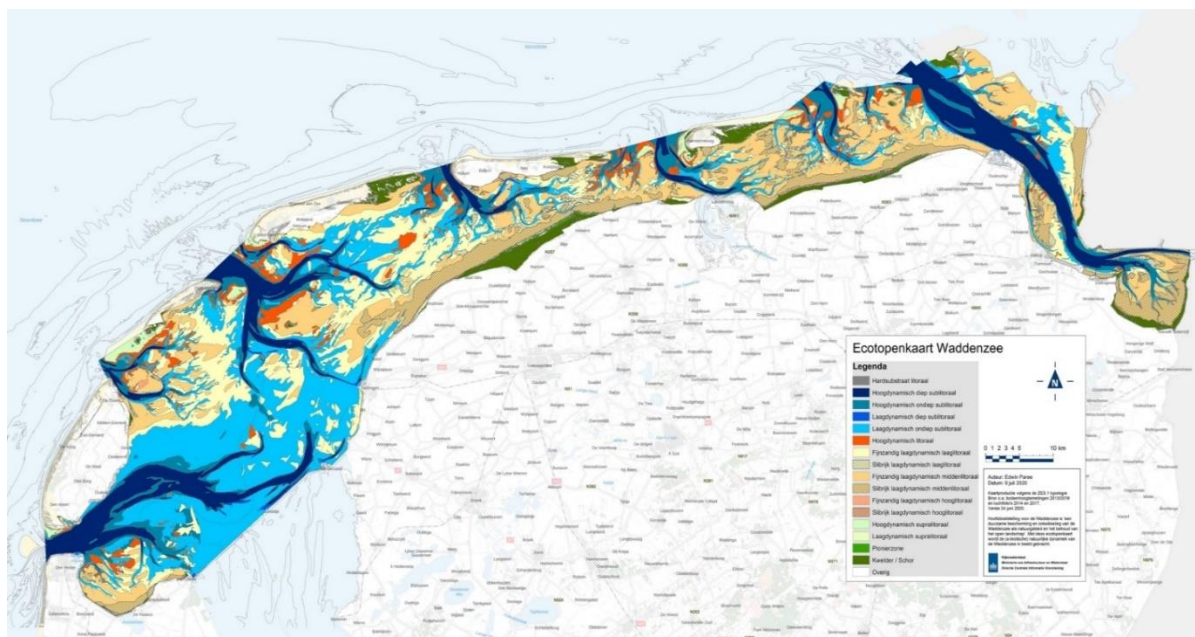


Figure 5. Map of ecotypes in the Dutch Wadden Sea, including the German Eems-Dollard (Rijkswaterstaat, 2020 through <https://maps.rijkswaterstaat.nl/gwproj55/index.html?viewer=Ecotopen>)

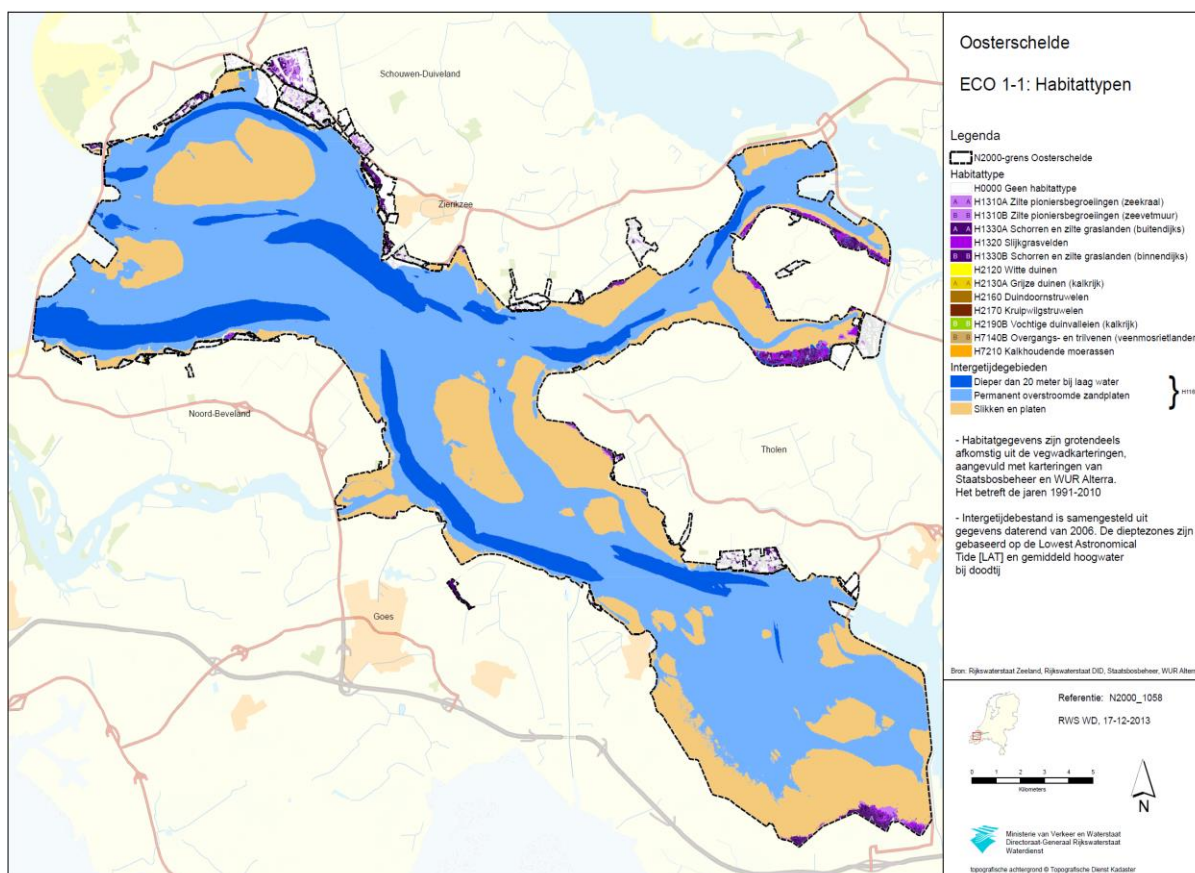


Figure 6. Habitat types Natura 2000-area Oosterschelde (Rijkswaterstaat, 2016)

The team also considered the habitat types designated under the EC Habitats Directive for each of the SACs in the UoA area. Note that The Netherlands has opted not to regard the biogenic structures mentioned in the European definition of habitat type reefs (H1170) as a separate habitat type, but to consider these structures under habitat types H1110, H1140 and H1160. This makes biogenic structures a characteristic of the structure and function of these three habitat types, although the fishery does not overlap with H1140 which is in the intertidal. Blue mussel banks are often found in co-occurrence with Pacific oysters (*Crassostrea gigas*) and Pacific oyster beds provide a habitat for many species naturally occurring on mussel beds; the associated biodiversity of mussel beds and oyster beds is largely similar. However, the Pacific oyster as a reef builder was not taken into account when assessing the structure and function characteristics of the N2000 habitats, because it is an invasive species and is expected to displace the mussel to some extent. It is instead a requirement that mussel beds in various stages of development are sufficiently present in the system (N2000 2014). Therefore, based on the analysis shown in Table 12 to Table 15, the argument can be made that blue mussel beds in the Oosterschelde and Dutch Wadden Sea should be considered as VMEs. This is indeed an argument put forward by a number of NGO stakeholders who engaged with the assessment during the site visit (see Appendix 8.2). This is not a straightforward issue to address because arguably, blue mussels are the targeted species in this fishery, with blue mussel beds the targeted habitat. This means that the requirements for blue mussel beds to be considered as ‘commonly encountered habitats’ are unambiguously met: 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.* However, the assessment team acknowledges that this approach disregards the N2000 designation of mussel banks as a biogenic structure under the three aforementioned habitat types. It may be appropriate, therefore, to make a distinction between naturally occurring blue mussel beds (which are fished for mussel seed) and culture plots (where the seed is relaid and adult mussels are harvested), with the former considered as VMEs, and the latter as a ‘main’ commonly encountered habitat.

According to N2000 (2014), mussel beds may exist at different stages of development:

1. Mussel seed beds that occur on unstable locations, where the seed has little chance of surviving the first winter. This type of seed bed makes little to no contribution to the maintenance of mussel beds as a biogenic structure.
2. Mussel seed beds that occur on stable, sheltered locations where the seed has a high probability of survival.
3. Mussel beds where after the first winter, the seed has developed into half-grown mussels.
4. Mussel beds that are older than 2 winters, with presence of live and dead mussels in diverse life stages, and associated biodiversity of fauna and flora (note that these stable beds are considered of less importance as a food source for birds than culture plots, where mussels have higher meat yields and thinner shells – N2000 (2014)).

In this reassessment, blue mussel beds were therefore considered as follows:

- UoA 1 (seed mussel collectors): not assessed;
- UoA 2 (mussel seed dredge): VME (Oosterschelde, Dutch Wadden Sea);
- UoA 3 (suspended culture): not assessed; and
- UoA 4 (bottom culture): commonly encountered.

The UoA impacts on these habitat types are further discussed in the Habitats scoring tables.

**Table 12. Overview of Habitat types designated under EC Habitats Directive for the Oosterschelde (from <https://eunis.eea.europa.eu/sites/NL3009016>), together with likelihood for overlap with the UoA.**

Habitat type	Cover [ha]	Overlap with UoAs likely?	Considered VME in this assessment?
1160 Large shallow inlets and bays	34700	Yes, UoA 2	Blue mussel beds as biogenic feature (SGB: solid reef of biogenic origin; low relief; small erect/ encrusting/ burrowing)
1310 <i>Salicornia</i> and other annuals colonizing mud and sand	214	No, no fishing in intertidal	No
1320 <i>Spartina</i> swards ( <i>Spartina maritima</i> )	403	No, no fishing in intertidal	No
1330 Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> )	743	No, no fishing in intertidal	No
2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes')	1.2	No, not a marine habitat	No
2160 Dunes with <i>Hippophaë rhamnoides</i>	1	No, not a marine habitat	No

**Table 13. Overview of Habitat types designated under EC Habitats Directive for the Voordelta (from <https://eunis.eea.europa.eu/sites/NL4000017>), together with likelihood for overlap with the UoA.**

Habitat type	Cover [ha]	Overlap with UoAs likely?	Considered VME in this assessment?
1110 Sandbanks which are slightly covered by sea water all the time	81260	No (UoAs 1 and 3 only in the Voordelta and these do not overlap with mussel beds)	No
1140 Mudflats and sandflats not covered by seawater at low tide	2224	No, no fishing in intertidal	No
1310 <i>Salicornia</i> and other annuals colonizing mud and sand	47	No, no fishing in intertidal	No
1320 <i>Spartina</i> swards ( <i>Spartina maritima</i> )	7	No, no fishing in intertidal	No
1330 Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> )	41	No, no fishing in intertidal	No
2110 Embryonic shifting dunes	10	No, not a marine habitat	No
2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes')	32	No, not a marine habitat	No

**Table 14. Overview of Habitat types designated under EC Habitats Directive for Grevelingen (from <https://eunis.eea.europa.eu/sites/NL4000021>), together with likelihood for overlap with the UoA.**

Habitat type	Cover [ha]	Overlap with UoAs likely?	Considered VME in this assessment?
1310 Salicornia and other annuals colonizing mud and sand	285	No, no fishing in intertidal	No
1330 Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> )	293	No, no fishing in intertidal	No
2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes')	15	No, not a marine habitat	No
2160 Dunes with <i>Hippophaë rhamnoides</i>	508	No, not a marine habitat	No
2170 Dunes with <i>Salix repens</i> ssp <i>argentea</i> ( <i>Salicion arenariae</i> )	230	No, not a marine habitat	No
2190 Humid dune slacks	478	No, not a marine habitat	No
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	1	No, not a marine habitat	No

**Table 15. Overview of Habitat types designated under EC Habitats Directive for the Dutch Waddensea (from <https://eunis.eea.europa.eu/sites/NL4000021>), together with likelihood for overlap with the UoA.**

Habitat type	Cover [ha]	Overlap with UoAs likely?	Considered VME in this assessment?
1110 Sandbanks which are slightly covered by sea water all the time	142568	Yes	Blue mussel beds in habitat subtype A (SGB: solid reef of biogenic origin; low relief; small erect/ encrusting/ burrowing)
1130 Estuaries	15326	Yes	No – does not meet definition as per GSA3.13.3.2
1140 Mudflats and sandflats not covered by seawater at low tide	129169	No, no fishing in intertidal	No
1310 Salicornia and other annuals colonizing mud and sand	3275	No, no fishing in intertidal	No
1320 <i>Spartina</i> swards ( <i>Spartina maritima</i> )	1479	No, no fishing in intertidal	No
1330 Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> )	6839	No, no fishing in intertidal	No
2110 Embryonic shifting dunes	10	No, not a marine habitat	No
2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes')	826	No, not a marine habitat	No

2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes')	158	No, not a marine habitat	No
2160 Dunes with <i>Hippophaë rhamnoides</i>	81	No, not a marine habitat	No
2170 Dunes with <i>Salix repens</i> ssp <i>argentea</i> ( <i>Salicion arenariae</i> )	2180	No, not a marine habitat	No
2190 Humid dune slacks	94	No, not a marine habitat	No

Habitat Performance Indicators are highly considered in suspended culture fisheries, under the MSC standard. The assessment team must consider the habitat impacts of bio-deposition and benthic organic enrichment and the ecosystem, and carrying capacity impacts of localized phytoplankton depletion from bivalve filtration (SB3.1.3.1, V2.01 Fisheries Standard).

The FCP guidance for organic enrichment (GSB3.1.3.1) notes that organic sediment build up underneath bivalve farms as a result of bivalve deposits leading to possible changes to benthic habitat and communities. The extent and severity of these habitat changes is most often site-specific and relate to a variety of factors including the following:

- Scale, duration, and intensity of shellfish production.
- Growing practices and methods.
- Concentration of suspended organic matter available for shellfish filtration.
- Water depth and sedimentation rate.
- Local currents and prevailing winds.

Research on the impact of both SMCs (spat collectors) and suspended culture has been detailed in Gascoigne et al, 2016a, and this issue will be further discussed in the Habitats scoring tables, under PI 2.4.

#### 6.4.7 Ecosystem

The general characteristics of the ecosystem are as described in the previous certification reports (e.g. SGS, 2011 and Gascoigne et al, 2016a) and are not repeated here. The UoA impacts on the ecosystem are discussed further in the Ecosystem scoring tables.

#### 6.4.8 Scoring elements

**Table 16. Principle 2 scoring elements. Note: UoA 5 does not assess PIs in 2.1 – 2.5, see Table 9.**

Component	Scoring elements	Designation	Data-deficient
Primary species	None	N/a	N/a
Secondary species	UoA 3: seaweed and small invertebrates such as bryozoans, tunicates and small crustaceans (see Gittenberger et al. (2015a) for a species list).	Minor	Yes, however RBF not applied.
	UoAs 2, 4: barnacles ( <i>Balanidae</i> spp.) and slipper limpets ( <i>Crepidula fornicata</i> )	Minor	Yes, however RBF not applied.
ETP species	Eider duck	N/a	No
	Harbour seal	N/a	No
	Grey seal	N/a	No
	Harbour porpoise	N/a	No
Habitats	Sand, mud, muddy sand and sandy mud	Main commonly encountered (UoAs 1, 3)	No
	Blue mussel beds	Main commonly encountered (UoA 4) VME (UoA 2)	No
Ecosystem	Impacts of translocation activities on all ecosystem components are assessed as part of PI 2.6.	N/a	No



## 6.5 Principle 2 Performance Indicator scores and rationales

### PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (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			
	Guide post	<p>Main primary species are <b>likely</b> to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, the UoA has measures in place that are <b>expected</b> to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main primary species are <b>highly likely</b> to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, there is either <b>evidence of recovery</b> or a demonstrably effective strategy in place <b>between all MSC UoAs which categorise this species as main</b>, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main primary species are above the PRI <b>and are</b> fluctuating around a level consistent with MSY.</p>
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
In the absence of main or minor primary species, this PI is <b>scored at 100</b> (SA3.2.1).				
b	Minor primary species stock status			
	Guide post			<p>Minor primary species are highly likely to be above the PRI.</p> <p>OR</p>

				If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
	Met?			<b>Yes</b>
Rationale				
In the absence of main or minor primary species, this PI is <b>scored at 100</b> (SA3.2.1).				
References				
Section 6.4.4				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		>80		
Information gap indicator		Information sufficient to score PI		
Data-deficient? (Risk-Based Framework needed)		No		
Overall Performance Indicator scores added from Client and Peer Review Draft Report				
Overall Performance Indicator score		100		
Condition number (if relevant)		-		



### 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			
	Guide post	There are <b>measures</b> 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 be above the PRI.	There is a <b>partial strategy</b> 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 PRI.	There is a <b>strategy</b> in place for the UoA for managing main and minor primary species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
In the absence of either main or minor primary species, a management strategy is not needed. <b>SG60, SG80 and SG100 are met.</b>				
b	Management strategy evaluation			
	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
In the absence of either main or minor primary species, a management strategy is not needed. <b>SG60, SG80 and SG100 are met.</b>				

c	Management strategy implementation			
	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its overall objective as set out in scoring issue (a)</b> .
	Met?		<b>Yes</b>	<b>Yes</b>
Rationale				
In the absence of either main or minor primary species, a management strategy is not needed. <b>SG80 and SG100 are met.</b>				
d	Shark finning			
	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>N/a</b>	<b>N/a</b>	<b>N/a</b>
Rationale				
No sharks are caught in this fishery and none are present in any of the SASIs conducted on culture plots, SMCs or suspended culture sites (see e.g. Gittenberger et al, 2015a and b). This scoring issue is not relevant.				
e	Review of alternative measures			
	Guide post	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 <b>regular</b> 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 <b>biennial</b> 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?	<b>N/a</b>	<b>N/a</b>	<b>N/a</b>

Rationale	
There is no unwanted catch of primary species. This scoring issue is not relevant.	
References	
Section 6.4.4	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	100
Condition number (if relevant)	-

### 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 primary species			
	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b>  <b>If RBF is used to score PI 2.1.1 for the UoA:</b>  Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is <b>adequate to assess</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b>  <b>If RBF is used to score PI 2.1.1 for the UoA:</b>  Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main primary species with respect to status.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
Although bycatch, most of which is retained, is not systematically recorded by the fishery, a periodic inventory using fishery gear is conducted of all species present on mussel culture plots, including seed mussel collection installations (SMCs). These are the SASIs, the process of which is explained in detail in Section 6.4.2, with recent SASIs discussed in Section 6.4.4. These provide a high degree of certainty that there are no main primary species in this fishery. <b>SG60, SG80 and SG100 are met.</b>				
b	Information adequacy for assessment of impact on minor primary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.

	Met?			Yes
Rationale				
The SASIs mentioned in scoring issue a provide some quantitative information to confirm that there are no minor primary species in this fishery. Therefore, <b>SG100 is met.</b>				
c	Information adequacy for management strategy			
	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> primary species, and evaluate with a <b>high degree of certainty</b> whether the strategy is achieving its objective.
	Met?	Yes	Yes	Yes
Rationale				
The sampling strategy used by the SASI process enables to confirm that there are no primary species in this fishery and therefore that a management strategy is not required. <b>SG60, SG80 and SG100 are met.</b>				
References				
Gittenberger et al., 2015a, 2015b, 2018				
<a href="#">Draft scoring range and information gap indicator added at Announcement Comment Draft Report</a>				
Draft scoring range		>80		
Information gap indicator		Information sufficient to score PI		
<a href="#">Overall Performance Indicator scores added from Client and Peer Review Draft Report</a>				
Overall Performance Indicator score		100		

Condition number (if relevant)	-
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### PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically 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			
	Guide post	<p>Main secondary species are <b>likely</b> to be above biologically based limits.</p> <p><b>OR</b></p> <p>If below biologically based limits, there are <b>measures</b> in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are <b>highly likely</b> to be above biologically based limits.</p> <p><b>OR</b></p> <p>If below biologically based limits, there is either <b>evidence of recovery</b> or a <b>demonstrably effective partial strategy</b> in place such that the UoA does not hinder recovery and rebuilding.</p> <p><b>AND</b></p> <p>Where catches of a main secondary species outside of biological limits are <b>considerable</b>, there is either <b>evidence of recovery</b> or a, <b>demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species</b>, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main secondary species are above biologically based limits.</p>
	Met?	<p><b>UoAs 1, 3 – N/a</b></p> <p><b>UoAs 2, 4 – N/a</b></p>	<p><b>UoAs 1, 3 – N/a</b></p> <p><b>UoAs 2, 4 – N/a</b></p>	<p><b>UoAs 1, 3 – N/a</b></p> <p><b>UoAs 2, 4 – N/a</b></p>
Rationale				
UoA 1 - Seed mussel collection by suspended ropes and nets (Oosterschelde, Wadden Sea and Voordelta)				

For the Oosterschelde (OS) and Voordelta (VD), a SASI is conducted of all species present on seed mussel collection installations (SMCs). The most recent SASI for SMCs in the OS and VD was in 2018 (Gittenberger et al. 2018) and follows previous SASIs carried out in 2012, 2014, 2015, 2016 and 2017. The SASI identified 81 species associated with the mussels on the SMCs, 22 of which were non-native, although none of these were considered as 'problematic' in the context of N2000 management. The 81 species included 41 species of algae, 3 annelids, 8 sea squirts, 3 bryozoans, 5 cnidarians, 10 crustaceans, 2 echinoderms, 4 molluscs, 1 teleost (butterfish – *pholis gunnellus*) and 4 sponges. Although no such inventory is made for SMCs in the Wadden Sea, it is reasonable to assume that the species list will be more or less the same (see discussion under Section 6.2.1). Species taken as 'bycatch' when mussels are harvested from the SMCs will be relaid onto the culture plots or in the 'socks' in the case of suspended culture, so any direct mortality as a result of the seed mussel collection is likely to be low. In the absence of evidence demonstrating that this is the case, however, this UoA was scored in the same way as the suspended culture UoA (3) where most of the bycatch is retained.

### **UoA 3 - On-growing of mussels grown using suspended ropes, collection of harvest size mussels from suspended ropes (Oosterschelde, Voordelta, Veerse Meer and Grevelingenmeer)**

A study by IMARES (Gittenberger et al, 2015a) found 56 species associated with the mussels in the 'socks', of which the most significant in terms of biomass are barnacles (*Balanus crenatus* and *Elminius modestus*), tunicates (*Ascidella scabra*, *Ascidella aspersa* and *Styela clava*), slipper limpets (*Crepidula fornicata*), seaweed and sometimes common starfish and common shore crabs. Although the Risk-Based Framework (RBF) was announced for the assessment of Secondary species outcome (2.2.1) for this UoA, discussions at the site visit indicated that, besides mussels, there are few other species associated with these installations, and certainly not in quantities that would qualify them as 'main' species. Note also that larger crabs or starfish will not be present as the installations do not come into contact with the seabed. All stakeholders present at the meeting agreed that a RBF on 'main' species was not required. In the absence of main species, this scoring issue is not applicable. Minor species, which include seaweed and small invertebrates such as bryozoans, tunicates and small crustaceans (see Gittenberger et al. (2015a) for a species list), were not assessed further with the RBF, which caps the **score at 80 for this PI**.

### **UoAs 2, 4 - Seed mussel collection from wild beds and harvest size mussel collection from culture plots by mussel dredge (Wadden Sea and Oosterschelde)**

Unlike in some mussel fisheries, there is no attempt in this fishery to sort out the bycatch prior to relaying on the culture plots. Stakeholders present at the site visit confirmed that all bycatch relaid onto the culture plots consists of species that are robust and opportunistic (e.g. common starfish (*Asterias rubens*), European green crab (*Carcinus maenas*) and Pacific oyster (*Crassostrea gigas*)). Before mussels are re-laid on empty culture plots, or when there is heavy starfish predation on a plot, they may be 'cleaned' of starfish by dragging heavy strips of fabric over the bottom – this 'velcros' up the starfish, which can then be disposed of in the subtidal away from the culture plots. During harvesting, the mussels are first rinsed with seawater to remove any larger organisms such as starfish and crabs. These are returned to the water instantly with high probability of survival. After harvesting, the mussels, together with the bycatch, are brought to the auction. An analysis of 2020 auction data carried out by the Dutch Mussel Auction shows that on average, the 'tarra' (cultch) component amounted to 17.2% of the total weight of mussel batches brought to auction; this includes empty shells, stones, as well as other invertebrates. Amongst the latter, 1.13% of the total amounted to barnacles (*Balanidae* spp.) and 0.1% to slipper limpets (*Crepidula fornicata*). On that basis, no 'main' species were identified. Although the Risk-Based Framework (RBF) was announced for the assessment of Secondary species outcome (2.2.1) for this UoA, stakeholders present at the site visit agreed that no RBF on 'main' species was required. In the absence of main species, this scoring issue is not applicable. Minor species were not assessed further with the RBF. which caps the **score at 80 for this PI**.



b	Minor secondary species stock status			
	Guide post			Minor secondary species are highly likely to be above biologically based limits.  <b>OR</b>  If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			<b>UoAs 1, 3 – No</b>  <b>UoAs 2, 4 – No</b>
Rationale				
<p>UoAs 1, 3: Minor species, which include seaweed and small invertebrates such as bryozoans, tunicates and small crustaceans (see Gittenberger et al. (2015a) for a species list), were not assessed further with the RBF, which <b>caps the score at 80</b> for this PI.</p> <p>UoAs 2, 4: An analysis of 2020 auction data carried out by the PO shows that on average, the 'tara' component amounted to 17.2% of the total weight of mussel batches brought to auction; this includes empty shells, stones, as well as other invertebrates. Amongst the latter, 1.13% of the total amounted to barnacles (Balanidae spp.) and 0.1% to slipper limpets (<i>Crepidula fornicata</i>). These minor species were not assessed further with the RBF. which <b>caps the score at 80</b> for this PI.</p>				
References				
Collinson et al. (2018) and Gittenberger et al. (2018), van Stralen et al, 2019a and b				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		60-79		
Information gap indicator		More information sought – RBF discussed during site visit		

Data-deficient? (Risk-Based Framework needed)	<b>Yes</b>
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	-

### 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			
	Guide post	There are <b>measures</b> 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 above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>partial strategy</b> 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 above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>strategy</b> in place for the UoA for managing main and minor secondary species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
In the absence of main secondary species for any of the UoAs, <b>SG60 and S80 are met by default</b> . However, it cannot be said that there is a full strategy in place for all of the minor species identified under 2.2.1. <b>SG100 is not met</b> .				
b	Management strategy evaluation			
	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is <b>some objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
In the absence of main secondary species for any of the UoAs, <b>SG60 and S80 are met</b> by default. No testing has been carried out, however. <b>SG100 is not met</b> .				

c	Management strategy implementation			
	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a)</b> .
	Met?		<b>Yes</b>	<b>No</b>
Rationale				
<p>During harvest, any bycatch tends to be retained and brought to the auction, with the exception of starfish which are disposed of away from the culture plots. There is no direct evidence (such as observer reports) as to the actions of the mussel fishermen in relation to bycatch species. The fishing locations of the fishermen are, however, monitored via the black box system, and Automatic Identification System (AIS), so the footprint of the fishery is known. The seed beds are also surveyed in autumn and spring, the SMCs in summer and the culture plots in spring (see Section 6.4.1). The species on the culture plots have been monitored via the PRODUS project (WS – see Drent and Dekker, 2013a and b) or via a SASI (Delta – e.g. Gittenberger, 2015b); hence any significant changes in biodiversity or in the presence of species of conservation concern would be picked up. Also, the harvesting of fully-grown consumption mussels from the bottom-culture plots has been on-going in the Dutch Wadden Sea for many decades, and the populations of crabs and starfish continue to flourish (Bolle et al. 2012). This provides some evidence that the partial strategy is being implemented successfully. <b>SG80 is met</b>. However, with regards to minor species (there are no main species), clear evidence or a clear management objective are lacking; therefore <b>SG100 is not met</b>.</p>				
d	Shark finning			
	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>N/a</b>	<b>N/a</b>	<b>N/a</b>
Rationale				
<p>No sharks are caught in this fishery and none are present in any of the SASIs conducted on culture plots, SMCs or suspended culture sites (see e.g. Gittenberger et al., 2015a and b). This scoring issue is not relevant.</p>				
e	Review of alternative measures to minimise mortality of unwanted catch			

	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of all secondary species, and they are implemented, as appropriate.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
In the absence of main secondary species for any of the UoAs, <b>SG60 and SG80 are met by default</b> . There is some unwanted catch of minor species, however (see 2.2.1), and this is not reviewed biennially. <b>SG100 is not met</b> .				
References				
Gittenberger et al. (2015a and b); Drent and Dekker (2013a and b); Bolle et al. (2012)				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		<60 (more information required)		
Information gap indicator		More information sought on the catch composition at auction and survival of starfish following relocation from culture plots		
Overall Performance Indicator scores added from Client and Peer Review Draft Report				
Overall Performance Indicator score		80		
Condition number (if relevant)		-		

### 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			
	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main secondary species with respect to status.  <b>OR</b>  <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and <b>adequate to assess</b> the impact of the UoA on main secondary species with respect to status.  <b>OR</b>  <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main secondary species with respect to status.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>Qualitative and some quantitative information is available for all UoAs in the form of species lists for the mussel beds, rope culture and SMCs: The SASIs record all species present on mussel culture plots, seed mussel collection installations (SMCs) and suspended culture as discussed in Section 6.4.4 (Gittenberger et al. 2018). The SASIs provide an indication of the likely species to be encountered in the bycatch (most of which is retained). There is also some quantitative information available for some species; e.g. density estimates of crab and starfish on the culture plots (van Stralen, 2018a and b). Culture plots are the most relevant here since species taken from the wild seed beds and SMCs are relayed on the plots – hence moved around rather than taken from the ecosystem. During the site visit, stakeholders agreed that there were no ‘main’ secondary species for any of the UoAs. Finally, 2020 auction data provide some quantitative data on which species are retained alongside the mussels, as discussed under PI2.2.1. These data will continue to be collected by the auction and can be made available for surveillance audits. Overall, the team concludes that some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status (i.e. there are no main secondary species). <b>SG60 and SG80 are met.</b> However, without a more systematic assessment of bycatch in the UoAs, there can be no high degree of certainty. <b>SG100 is not met.</b></p>				

b	Information adequacy for assessment of impacts on minor secondary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			<b>No</b>
Rationale				
None of the minor secondary species (most of which are invertebrates) are assessed. This scoring issue is not met.				
c	Information adequacy for management strategy			
	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> secondary species, and <b>evaluate</b> with a <b>high degree of certainty</b> whether the strategy is <b>achieving its objective</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
As explained under scoring issue a, the information available provides sufficient confidence to conclude that there are no main secondary species for any of the UoAs. <b>SG60 and SG80 are therefore met by default</b> . In the absence of a full strategy, or more systematic monitoring of all minor species (invertebrates) present in the bycatch, <b>SG100 cannot be met</b> .				
References				
Gittenberger et al. (2018), van Stralen et al, 2019a and b				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		<b>60 – 79 (more information needed)</b>		

Information gap indicator	More information sought on the catch composition at auction and survival of starfish following relocation from culture plots
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	-

### PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species		
		The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the <b>effects of the UoA</b> on the population/ stock are known and <b>likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, the <b>combined effects of the MSC UoAs</b> on the population /stock are known and <b>highly likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a <b>high degree of certainty</b> that the <b>combined effects of the MSC UoAs</b> are within these limits.
	Met?	<b>Harbour porpoise – Yes</b>	<b>Harbour porpoise – Yes</b>	<b>Harbour porpoise – No</b>
Rationale				
ETP species scoring elements are (see Section 6.4.5 for discussion):				
<ul style="list-style-type: none"> <li>Eider duck (Wadden Sea and Voordelta)</li> <li>Harbour seal (all areas)</li> </ul>				



- Grey seal (all areas)
- Harbour porpoise (Wadden Sea, Voordelta and Oosterschelde)

This scoring issue is only scored if there are national or international requirements that set limits for ETP species. This only applies to the harbour porpoise for which ASCOBANS defined a 1.7% threshold beyond which levels of interaction are deemed unacceptable. The potential direct effects from the fishery mainly concern entanglement in SMCs and suspended culture installations. The ICES Working Group on Bycatch of Protected Species (WGBYC) completed a Bycatch Risk Assessment (BRA) for harbour porpoise in the Greater North Sea ecoregion. Data were pooled from 2015-2017 and minimum and maximum bycatch rates extrapolated using 2017 fishing effort data for nets, bottom trawls and pelagic trawls. Bycatch rates were highest in nets in both ecoregions and the percentage mortality of harbour porpoise varied between 0.33 - 0.59% well below the ASCOBANS 1.7% threshold and below the 1% precautionary environmental limit (ICES 2019). 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. While entanglement in aquaculture gear is not unknown, cases are extremely rare, and where cases have occurred, they have generally occurred in mussel spat collectors or buoy lines connected to them (Young, 2015; NOAA, 2017), in cases where mussel spat collectors consist of long lines that move with the currents. The systems used on the Dutch waters are short (around 3-4 meters long), and consist either of longlines, or nets. The timing of the placement is tuned to the spatfall, so soon after placement the lines and nets will grow over (see Figure 7), which makes the systems easily pick up with the sonar used by porpoises. This also makes it unlikely (near impossible) for porpoise to swim between the lines and get entangled.



**Figure 7. Types of substrate used in SMCs (figure 5 in Kamermans et al, 2014)**

Appropriate Assessments needed for the Nature conservation licences for SMCs and rope grown culture regularly assess the risk these fishing activities may have on the species and have found no issues to date (Agonus, 2019; Kamermans et al, 2014). It is therefore highly likely that the combined effects of the MSC UoAs (across the MSC

programme) on harbour porpoise are within the ASCOBANS limits. **SG60 and SG80 are met. SG100 is not met** because ICES ecoregions are arbitrary and are unlikely to reflect the true population structure of harbour porpoise (ICES 2019).

b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not <b>hinder recovery</b> of ETP species.	Known direct effects of the UoA are likely to not <b>hinder recovery</b> of ETP species.	There is a <b>high degree of confidence</b> that there are no <b>significant detrimental direct effects</b> of the UoA on ETP species.
	Met?	<b>Harbour porpoise – Yes</b>  <b>Eider duck – Yes</b>  <b>Harbour and grey seal - Yes</b>	<b>Harbour porpoise – Yes</b>  <b>Eider duck – Yes</b>  <b>Harbour and grey seal - Yes</b>	<b>Harbour porpoise – Yes</b>  <b>Eider duck – Yes</b>  <b>Harbour and grey seal - Yes</b>

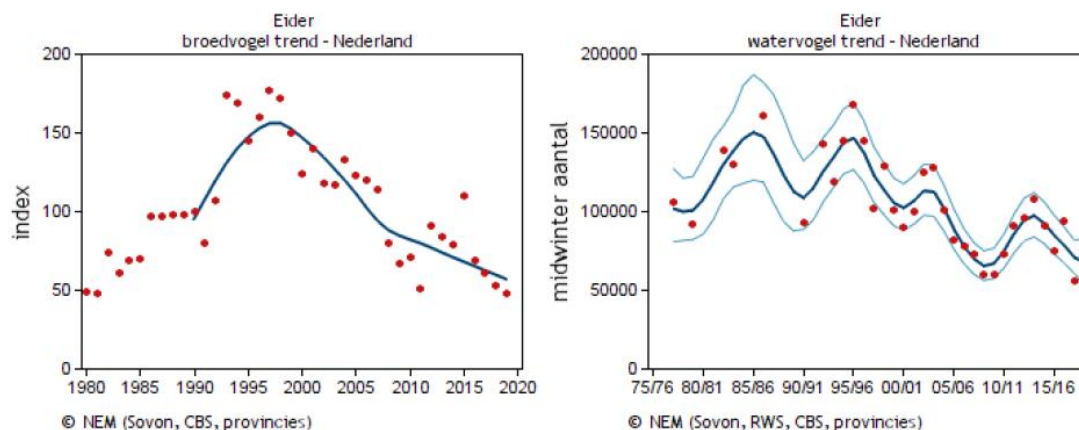
#### Rationale

Harbour porpoise (*Phocoena phocoena*): As explained in scoring issue a, the potential direct effects from the fishery on this species mainly concern entanglement in SMCs and suspended culture installations. 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. While entanglement in aquaculture gear is not unknown, cases are extremely rare, and where cases have occurred, they have generally occurred in mussel spat collectors or buoy lines connected to them (Young, 2015; NOAA, 2017), in cases where mussel spat collectors consist of long lines that move with the currents. The systems used on the Dutch waters are short (around 3-4 meters long), and consist either of longlines, or nets. The timing of the placement is tuned to the spatfall, so soon after placement the lines and nets will grow over (see Figure 7), which makes the systems easily pick up with the sonar used by porpoises. This also makes it unlikely (near impossible) for porpoise to swim between the lines and get entangled. Appropriate Assessments needed for the Nature conservation licences for SMCs and rope grown culture regularly assess the risk these fishing activities may have on the species and have found no issues to date (Agonus, 2019; Kamermans et al, 2014). There is a therefore a high degree of confidence that there are no significant detrimental direct effects of the UoAs on this ETP species. **SG60, SG80 and SG100 are met.**

Based on the information presented by De Vlas et al. (2014), the common eider duck (*Somateria mollissima*) was considered as the only bird scoring element (Section 6.4.5), with main impacts stemming from indirect effects such as reduced food availability and disturbance. These matters are further discussed in scoring issue c. There are no direct effects of the UoAs on eider ducks or birds in general, through bycatch or entanglement in either the bottom culture or suspended fisheries or SMCs (as determined in appropriate assessments, see for example de Mesel et al. (2009)). There is therefore a high degree of confidence that there are no significant detrimental direct effects of the UoAs on birds (including the common eider duck). **SG60, SG80 and SG100 are met.**

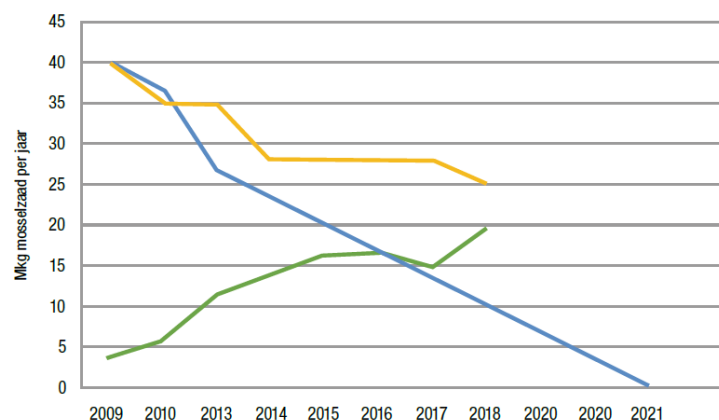
Two species of seal breed in the Netherlands, the grey seal (*Halichoerus grypus*) and the harbour seal (*Phoca vitulina*). The populations of both species have increased markedly over the past 40 years. Harbour seals have recovered from a minimum number of around 500 in 1980 to some 9,000 seals in 2016, despite recurrent phocine distemper virus (PDV) epidemics, although the Dutch harbour seal population has stopped growing in recent years (after 15 years of exponential growth), indicating that the population may be near its carrying capacity (Zande et al. 2018). Grey seals were effectively absent from the Netherlands until 1980, but have also made a remarkable recovery, with numbers counted during the annual moult having increased to around 5,100 in 2016 (Zande et al. 2018). Note that neither the harbour seals nor grey seals in the Netherlands are considered to be a discrete population. The grey seals form a relatively small part of a mixed North Sea population, accounting for approximately 3% (in 2016) of the total pup production for the North Sea. In contrast, the Wadden Sea harbour seal population represents a large component (~85% in 2015) of the southern North Sea population (Zande et al. 2018). In terms of direct UoA impacts, entanglement in SMC installations poses the most significant risk amongst the UoAs assessed and this is routinely reviewed in appropriate assessments as part of any SMC licence application. SMC installations are further required to prevent seals from entering the installations by closing off the long buoys (Mesel et al. 2009); any incidences further have to be reported to the authorities. In the absence of such reports, there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on the seal species concerned. **SG60, SG80 and SG100 are met.**

c	Indirect effects			
	Guide post		Indirect effects have been considered for the UoA and are thought to be <b>highly likely</b> to not create unacceptable impacts.	There is a <b>high degree of confidence</b> that there are no <b>significant detrimental indirect effects</b> of the UoA on ETP species.
	Met?		<b>Common eider – Yes</b>  <b>Harbour and grey seal – Yes</b>  <b>Harbour porpoise – Yes</b>	<b>Common eider – No</b>  <b>Harbour and grey seal – Yes</b>  <b>Harbour porpoise – Yes</b>
Rationale				
Eider duck populations (both breeding and non-breeding) in The Netherlands have declined in recent years (Blew et al. 2017) and are below their Natura 2000 objectives (de Vlas et al., 2014); this is also apparent from the latest survey data collected by the Sovon Dutch Centre For Field Ornithology (Figure 8).				



**Figure 8. Trends in eider duck abundance in The Netherlands based on Sovon Dutch Centre For Field Ornithology data. Left: annual population index based on numbers in the most important breeding areas (red dots) and average trend (blue line); Right: Number of birds in January (red dots), average trend (dark blue line) and 95% confidence interval (light blue lines). Note the majority of sightings were made in the Dutch Wadden Sea. From <http://s1.sovon.nl/soorten.asp?euring=2060>**

It is acknowledged that a lack of subtidal and intertidal shellfish beds as a food source is likely to have contributed to the decline; however other factors are in play as well such as the spread of the Japanese oyster (which is not a suitable food source for eiders), climate change, pollution and reduced nutrient input. To address the issues surrounding reduced food availability, an overall management objective for the mussel fishery has been set which is to “make the mussel sector less dependent on the natural seed fall in the Wadden Sea and to reduce free mussel seed fishing in the Wadden system” (MLNV 2004). Under this objective, the Mussel Transition Agreement (see Section on 6.6.2) was put in place, where the mussel sector and NGOs agreed to a gradual replacement of bottom seed production in the subtidal of the Wadden Sea, paired with the development of alternative seed sources which would enable to maintain the economic viability of the mussel sector. In this context, seed stemming from SMCs was considered as a key alternative source and 760 hectares were allocated for this activity (500 ha in the Wadden Sea and 260 ha in the Delta area). The implementation of this agreement is one of the key actions identified under Natura 2000 to restore Dutch eider duck populations (de Vlas et al., 2014). In 2019, the Transition Agreement was being implemented as set out in the Implementation Plan and as shown in Figure 9.



**Figure 9. Implementation of the Mussel Transition Agreement up to 2018. Blue: projected reduction in bottom mussel seed production (Mkg) at start of Agreement; yellow: actual reduction in bottom mussel seed production; green: actual increase in SMC production. From PNRW (2019)**

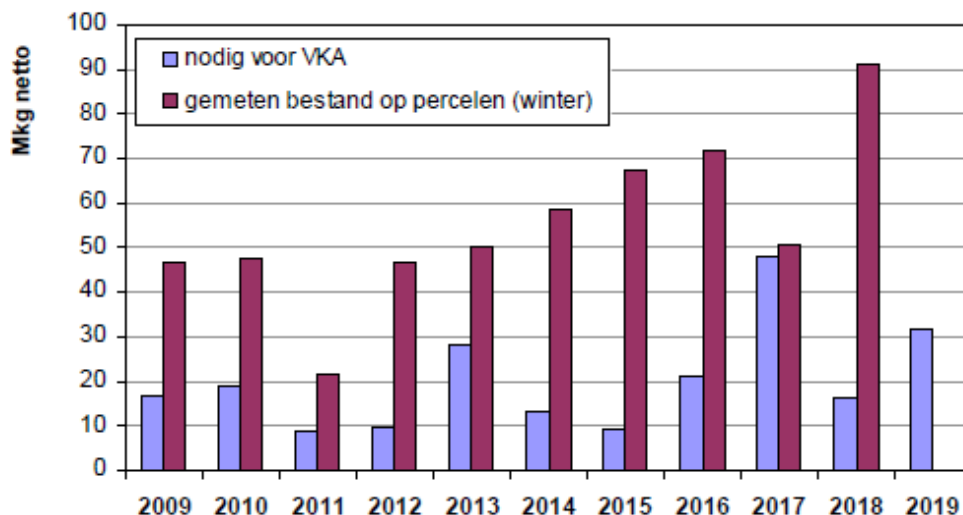
Although bottom mussel seed production did decline by about 40% by 2018 (compared to 2009 levels), the amount produced was still above projected levels under the agreement. The lower-than-expected production of the MZIs (including in terms of quality) and higher associated costs were a key factor as to why bottom seed production levels stayed above target. Acknowledging that the initial 2020 target would not be reached, a new agreement was reached in December 2020 between the *Coalitie Wadden Natuurlijk*, the *PO Mosselcultuur* and the *Ministerie van Landbouw, Natuur en Voedselkwaliteit (LNV)*: from Spring 2021, 36% of the Dutch Wadden Sea will already have been closed to the bottom seed fishery. This will be gradually increased to 50% in 2022 and 65% in 2026. The intent is to achieve a 100% closure by 2029, but only if this is economically viable for the mussel sector. In parallel, another 760 ha will be made available to SMC seed production (with some flexibility in locations to ensure quality can be maintained) with subsidies also provided.

In addition to this agreement, the VKA scheme is in place which ensures that, given the generally better quality of mussels on culture plots and the fact that eiders also forage on those plots, there are no significant effects from the mussel seed fishery + culture + removal (Vissen, Kweken, Afvoer in Dutch - VKA) on the species overall. In this context, the management system has to ensure that the amount of available mussels for food in the coming winter would not be less than in a situation where there would be no fishing. This concept is applied through a calculation model which can be used to determine the minimum number of mussels that should be placed on the culture plots in autumn and which should remain available as a food source for birds. Using the results of the PRODUS study, the model was adjusted in 2014 and improved. For example, for 2019, the model calculated the minimum mussel stock that should be present on the culture plots in Autumn at 31.8 million kg (= 318,000 mt) net. This is then combined with a stock assessment that takes place on the culture plots each year, following the surveys on the seed beds (see Figure 10). The Wadden Unit then assesses, based on mussel production data, whether there is a risk that this minimum amount will be affected by the fishery and measures are taken as appropriate (see Figure 11) (van Stralen, 2019b). The implementation of this VKA-scheme is part of the N2000-licence for the fishery, and shows that a surplus of mussels are left in the Wadden Sea each winter, which can serve as a food source for the eider ducks overwintering in the area (see Figure 11).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Jaar	Jaarklas mosselen	Opper- vlak ha	+ 10%	Verlaging van het wilde mosselbestand in het najaar als gevolg van mosselzaadvisserij Mkg netto versgewicht																
					2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
2005	najaar	2005	389	432	1.3	3.3	0.7	0.7	0.7	0	0	0	0							
2006	voorjaar	2005	35	39		1.6	0.4	0.4	0.4	0.3	0	0	0							
	najaar	2006	43	48		0.1	0.4	0.1	0.1	0.1	0	0	0	0						
2007	voorjaar	2006	0	0			0.0	0.0	0.0	0.0	0.0	0	0	0						
	najaar	2007	440	489			1.5	3.7	0.8	0.8	0.8	0	0	0	0					
2008	voorjaar	2007	126	140				5.6	1.6	1.6	1.6	1.1	0	0	0					
	najaar	2008	555	617				1.9	4.7	1.0	1.0	1.0	0	0	0	0				
2009	voorjaar	2008	154	171					6.8	1.9	1.9	1.9	1.4	0	0	0				
	najaar	2009	618	687					2.1	5.2	1.1	1.1	1.1	0	0	0	0			
2010	voorjaar	2009	182	202						8.1	2.3	2.3	2.3	1.6	0	0	0			
	najaar	2010	0	0						0.0	0.0	0.0	0.0	0.0	0	0	0	0		
2011	voorjaar	2010	0	0							0.0	0.0	0.0	0.0	0.0	0	0	0	0	
	najaar	2011	0	0							0.0	0.0	0.0	0.0	0.0	0	0	0	0	0
2012	voorjaar	2011	0	0								0.0	0.0	0.0	0.0	0.0	0	0	0	0
	najaar	2012	677	752								2.3	5.7	1.2	1.2	1.2	0	0	0	0
2013	voorjaar	2012	401	446									17.8	5.0	5.0	5.0	3.6	0	0	0
	najaar	2013	0	0									0.0	0.0	0.0	0.0	0.0	0	0	0
2014	voorjaar	2013	130	144										5.8	1.6	1.6	1.6	1.2	0	0
	najaar	2014	0	0										0.0	0.0	0.0	0.0	0.0	0	0
2015	voorjaar	2014	0	0											0.0	0.0	0.0	0.0	0.0	0
	najaar	2015	437	486											1.5	3.7	0.8	0.8	0.8	0
2016	voorjaar	2015	101	112												4.5	1.3	1.3	1.3	0.9
	najaar	2016	1577	1752												5.3	13.2	2.9	2.9	2.9
2017	voorjaar	2016	621	690													27.5	7.7	7.7	7.7
	najaar	2017	0	0													0.0	0.0	0.0	0.0
2018	voorjaar	2017	0	0														0.0	0.0	0.0
	najaar	2018	874	971														2.9	7.3	1.6
2019	voorjaar	2018	268	298															11.9	3.3
	najaar																		pm	pm
																			pm	pm
Totaal	= in najaar te borgen perceelbestand				1.3	5.0	3.0	12.4	17.1	18.9	8.7	9.7	28.2	13.6	9.3	21.3	48.0	16.7	31.8	pm
Gemeten bestand op percelen					14.9	35.8	35.3	29.7	46.5	47.5	21.9	46.7	50.1	58.7	67.5	71.8	50.4	91.5	pm	pm

Figure 10. VKA model calculation for the mussel seed fishery in 2005-19. Column 5: surface area of new seed banks that have been opened to the seed fishery for that year (najaar: autumn; voorjaar: spring). The model assumes that 10% of new seed banks surface area is missed during the surveys. Columns 6 – 21: the reduction of the wild biomass as a result of the seed fishery, with distinction between seed banks that were fished for the first time in autumn (unstable) and during spring (stable).

Penultimate row: yearly total of reduction of wild biomass as a result of the seed fishery. Final row: mussel biomass on the culture plots, as measured in Autumn during surveys by the Wadden-unit. Source: van stralen (2019b).



**Figure 11.** In purple, the reduction of wild mussel biomass in autumn (in million kg net liveweight) as a consequence of the mussel seed fishery in preceding years. This is the amount of mussels that should be present on the culture plots in Autumn of that same year to maintain the overall balance of the system. In red: the mussel biomass present on the culture plots during autumn or winter according to the surveys. See Figure 10 for calculation. Source: van stralen (2019b).

The combination of measures, both the closures of fishing grounds as defined in the Agreement and the use of the VKA-model, which is followed closely by the control authorities (see section 6.6.4 and PI 3.2.3) makes it highly likely that the fishery does not create unacceptable impacts on the Natura 2000-goals for the eider duck population. SG80 is met. The Appropriate Assessment underpinning the Nature licence for the seed fishery in the Wadden Sea (van Stralen, 2018) concludes that through the implementation of the VKA-model and the certainty that for the last decade a surplus of mussels has remained on the mussel plots during the winter, significant negative effects on the eider duck population are mitigated. However, due to the delay in implementation of the closures as agreed in the Mussel Agreement, the teams considers that a high degree of confidence is not achieved. **SG80 is met, but SG100 is not met.**

For the Voordelta, where Eider ducks are also a designated Natura 2000-species, a fishing licence for the seed fishery is rare, and only provided when the survey shows that the seed bed is heavily infested with starfish, making the bed unlikely to last till winter, and thus unlikely to provide food for wintering birds, like eider ducks (see condition 13 in the Nature licence, Ministry LNV (2019a)). When the survey shows heavy starfish predation, the management authorities will check this conclusion before



providing the necessary licence. The Appropriate Assessment underpinning the Nature licence for the seed fishery in the Voordelta (Capelle, 2019) concludes that through this system, significant negative effects on shellfish eating ducks as a result of fishing their food source are mitigated. However, since the survey carried out in the Voordelta mainly focusses on a few areas, and does not give the same high-density overview as the Wadden Sea surveys, the teams considers that a high degree of confidence is not achieved. **SG80 is met, but SG100 is not.**

Other indirect impacts on birds and seals through disturbance by bottom culture activities are managed through the Natura 2000 management plans by prohibiting any fishing activities within 500m from breeding or foraging birds, and within 1500 from seals. The majority of SMCs and suspended culture installations are located beyond these limits, and for those that are not, any risks are reviewed through appropriate assessments that are carried out as part of any SMC or suspended culture licence application (e.g. de Mesel et al., 2009); Smaal and Brink, 2011); Kamermans et al, 2014). There is therefore a high degree of confidence that there are no significant detrimental indirect effects of the UoAs on seal or bird species through disturbance. **SG80 and SG100 are met.**

For harbour porpoise, the only relevant indirect effect would be noise disturbance from installation, maintenance or harvesting processes. Given that this is a highly mobile species, any areas with temporary disturbance can be avoided. As such, there is a high degree of confidence that there are no significant detrimental indirect effects of the UoAs on harbour porpoise through disturbance. **SG80 and SG100 are met.**

#### References

Van de Mesel et al. (2009); Smaal and Brink (2011); PNRW (2019); Agonus, (2019); Kamermans et al. (2014); Capelle, (2019); van Stralen (2018, 2019b)

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>60 - 79</b>
Information gap indicator	More information sought about implementation of Mussel Transition Agreement and likely impacts on common eider duck Natura 2000 goals.
Data-deficient? (Risk-Based Framework needed)	<b>No</b>

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Scoring element	Score
Harbour porpoise	<b>95</b>
Grey seal	<b>100</b>



Harbour seal	<b>100</b>
Eider duck	<b>90</b>
Overall Performance Indicator score	<b>90</b>
Condition number (if relevant)	-

### PI 2.3.2 – ETP species management strategy

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> <li>- meet national and international requirements;</li> <li>- ensure the UoA does not hinder recovery of ETP species.</li> </ul> Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are <b>measures</b> in place that minimise the UoA-related mortality of ETP species, and are expected to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>comprehensive strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to <b>achieve above</b> national and international requirements for the protection of ETP species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>Eider ducks are protected under the EC Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds) with designated Special Protected Areas (SPAs) and grey and harbour seal and harbour porpoise are protected under the EC Habitats Directive (Directive 92/43/EEC) with designated Special Areas of Conservation (SACs). Both SPAs and SACs are part of the Natura 2000 (N2000) network of sites of ecological importance. All of the UoAs in this assessment (except for the translocation UoA) take place in N2000 sites that are designated by the Minister of Agriculture, Nature and Food Quality (Ministry LNV, Department Nature &amp; Biodiversity), and managed by their respective competent authorities, mainly the Provinces, but in some cases the Ministry of Infrastructure and Environment (Ministerie Infrastructuur en Milieu: I&amp;M) or LNV. In the case of all UoAs, the Ministry of LNV is the competent authority.</p> <p>The following management plans exist:</p>				

- Natura 2000 Deltawateren Beheerplan 2016-2022 – Oosterschelde, Veerse Meer, Grevelingen (Rijkswaterstaat 2016b; Rijkswaterstaat 2016c; Rijkswaterstaat 2016a)
- Natura 2000 Beheerplan 2015-2021 – Voordelta (Rijkswaterstaat 2015)
- Natura 2000 Beheerplan 2016-2022 – Waddenzee (Rijkswaterstaat 2016d)

Each of the management plans sets out measures for the achievement of the N2000 nature conservation targets for the species concerned. As the bottom culture fishery was already present when the N2000 areas were initially designated and are thought to have no significant negative effects on the N2000 conservation targets, this activity is managed through the above management plans. All other activities such as suspended culture, the seed mussel fishery, or seed mussel collection with SMCs requires a separate licence with an appropriate assessment which includes an impact study of the activity on N2000 qualifying features. For eider ducks in particular, food availability in the Dutch Wadden Sea is ensured through the Mussel Transition Agreement (Convenant 'Transitie Mosselsector en Natuurherstel') which was agreed between government, the mussel sector and eNGOs in 2008, and requires that wild seed caught by dredge in the Western Wadden Sea is gradually replaced with seed from alternative sources such as SMCs or imports. The initial aim was that this transition would be achieved by 2020; however, there is an acknowledgement that the transition has to be based on trial and error, with step-wise implementation and monitoring of results and that this target may therefore be adjusted on the basis of research results, evaluation and experience (Rijkswaterstaat, 2015). The transition was initiated in 2009, with an annual closure of 20% of spring mussel beds to the seed fishery, which was subsequently increased to 40% in 2013. An evaluation of the agreement in 2013 revealed that the 2020 target was not achievable; the stepwise increase in spring mussel bed closures therefore continues. As outlined under PI 2.3.1c, a new agreement was reached in December 2020 between the *Coalitie Wadden Natuurlijk*, the *PO Mosselcultuur* and the *Ministerie van Landbouw, Natuur en Voedselkwaliteit (LNV)*: from Spring 2021, 36% of the Dutch Wadden Sea will already have been closed to the bottom seed fishery. This will be gradually increased to 50% in 2022 and 65% in 2026. The intent is to achieve a 100% closure by 2029, but only if this is economically viable for the mussel sector. In addition to this agreement, measures are in place for the bottom culture as well, based on the concept that the combination of fishing, cultivation and the eventual removal of mussels does not lead to fewer mussels in the Wadden Sea. The implementation of this VKA-scheme is part of the Nature-licence for the fishery. Using the results of the PRODUS study, the model was adjusted in 2014 and improved, and replaced the more general rule that that 85% of the mussel spat fished during the spring fishery (or the biomass equivalent) needs to remain on the mussel plots in the Wadden Sea for up to 1 year and thus cannot be moved to the Oosterschelde during winter. As shown in PI 2.3.2c, there has been a surplus of mussels remaining in the Wadden Sea (see Figure 11). All of the intertidal is also closed to the mussel fishery: the Dutch Wadden Sea lost virtually all (~4000 ha) its intertidal mussel beds around 1990 due to overfishing in combination with storms and recruitment failure. Re-establishment is now occurring, albeit slowly, as factors outside the fishery's control – such as the spread of Pacific oysters – influence mussel resettlement (Christianen et al., 2017).

Harbour porpoise was only added as a qualifying feature to the N2000 sites in 2018. This species is therefore not yet included in the management plans. However, the current measures in place for the prevention of seal mortality in the suspended culture and SMC installations are likely to benefit this species as well. Furthermore, any licence application would henceforth also include an impact assessment of the fishing activity on harbour porpoise.

All of the above management measures are part of a wider strategy which includes monitoring of the ETP species concerned. For birds, the Joint Monitoring of Migratory Birds (JMMB) in the Wadden Sea, carried out in the framework of Trilateral Monitoring and Assessment Programme (TMAP), consists of (a) at least two synchronous, complete counts each year, (b) frequent (bi-monthly to monthly) spring tide counts at 60 counting sites, (c) additional three counts for geese (March, May, November), and (d) aerial counts for Eider in winter and for Shelduck during wing moult (July/August) in Germany and the Netherlands (Blew et al. 2017). As part of the TMPA,

trilaterally coordinated surveys are also regularly conducted for seals in the Wadden Sea, the latest of which was in 2016 (Jensen et al. 2017). For harbour porpoise, there have been three major abundance surveys conducted in the North Sea, i.e. SCANS in 1994 and SCANS-II in 2005, and SCANS III in 2017 (Jensen et al. 2017). In The Netherlands, the 'Monitoring Waterstaatkundige Toestand des Lands' (MWTL) is a long-running program keeping track of (among other things) morphology, emissions and also biology (birds, seals, but also benthos). This program has incorporated specific monitoring for the N2000 targets. Partners in this monitoring program (e.g. SOVON for birds) report annually on numbers and trends (see e.g. <https://www.sovon.nl/nl/gebieden>). The combination of the above measures, combined with the extensive monitoring in place of ETP bird populations indicates that 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. **SG60 and SG80 are met.** Although it could be argued that this is a comprehensive strategy, it is not designed to achieve above national and international requirements for the protection of ETP species. As such, **SG100 is not met.**

b	Management strategy in place (alternative)			
	Guide post	There are <b>measures</b> in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>strategy</b> in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>comprehensive strategy</b> in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	<b>N/a</b>	<b>N/a</b>	<b>N/a</b>
Rationale				
This scoring issue is only scored if there are no national or international requirements for the protection of ETP species. This is not relevant here.				
c	Management strategy evaluation			
	Guide post	The measures are <b>considered likely</b> to work, based on <b>plausible argument</b> (e.g., general experience, theory or comparison with similar fisheries/species).	There is an <b>objective basis for confidence</b> that the measures/strategy will work, based on <b>information</b> 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 <b>quantitative analysis</b> supports <b>high confidence</b> that the strategy will work.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The measures set out in scoring issue a are based on best available science, with some agreed in collaboration with eNGOs (e.g. Mussel Transition Agreement). For any activity not covered by the Natura 2000 management plan, appropriate assessments are carried out by independent experts and ensure that the activities do not negatively affect N2000 conservation targets. On that basis, there is an objective basis for confidence that the strategy will work. **SG60 and SG80 are met.** Although extensive monitoring of ETP species takes place, some trends cannot be fully explained (e.g. eider duck populations are still in decline - Blew et al. (2017)); growth of Wadden Sea seal populations has stalled - Jensen et al. (2017)). There is therefore no high confidence that the strategy will work. **SG100 is not met.**

d	Management strategy implementation			
	Guide post		There is some <b>evidence</b> that the measures/strategy is being implemented successfully.	There is <b>clear evidence</b> that the strategy/comprehensive strategy is being implemented successfully and <b>is achieving its objective as set out in scoring issue (a) or (b).</b>
	Met?		<b>Yes</b>	<b>No</b>
Rationale				
<p>In terms of disturbance and entanglement, operational requirements for suspended seed installations and SMCs are laid out in the licences and are subject to inspections, while adherence to N2000 requirements (such as keeping sufficient distance from birds and seals) is verified with the black box system by the PO. For the eider ducks, the Transition Agreement is in place (see 2.3.1c). The initial aim was that this transition would be achieved by 2020; however, there is an acknowledgement that the transition has to be based on trial and error, with step-wise implementation and monitoring of results and that this target may therefore be adjusted on the basis of research results, evaluation and experience (Rijkswaterstaat, 2015). The transition was initiated in 2009, with an annual closure of 20% of spring mussel beds to the seed fishery, which was subsequently increased to 40% in 2013. An evaluation of the agreement in 2013 revealed that the 2020 target was not achievable; the stepwise increase in spring mussel bed closures therefore continues. As outlined under PI 2.3.1c, a new agreement was reached in December 2020 between the <i>Coalitie Wadden Natuurlijk</i>, the <i>PO Mosselcultuur</i> and the <i>Ministerie van Landbouw, Natuur en Voedselkwaliteit (LNV)</i>: from Spring 2021, 36% of the Dutch Wadden Sea will already have been closed to the bottom seed fishery. This will be gradually increased to 50% in 2022 and 65% in 2026. The intent is to achieve a 100% closure by 2029, but only if this is economically viable for the mussel sector. In addition to this agreement, measures are in place for the bottom culture as well, based on the concept that the combination of fishing, cultivation and the eventual removal of mussels does not lead to fewer mussels in the Wadden Sea. The implementation of this VKA-scheme is part of the Nature-licence for the fishery. Using the results of the PRODUS study, the model was adjusted in 2014 and improved, and replaced the more general rule that that 85% of the mussel spat fished during the spring fishery (or the biomass equivalent) needs to remain on the mussel plots in the Wadden Sea for up to 1 year and thus cannot be moved to the Oosterschelde during winter. As shown in PI 2.3.2c, there has been a surplus of mussels remaining in the Wadden Sea (see Figure 11). Overall, there is some evidence that the strategy is being implemented successfully and <b>SG80 is met</b>. <b>SG100 is not met</b> owing to the delayed implementation of the Transition Agreement.</p>				

e	Review of alternative measures to minimize mortality of ETP species			
Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.	
Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>	
Rationale				
All N2000 management plans are subject to a regular review (with new plans issued every 6 years). For the mussel transition agreement, implementation reviews also take place regularly, the latest of which was in 2018 (PRW, 2019). There is therefore 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. <b>SG60 and SG80 are met. SG100 is not met</b> as the reviews are not biennial.				
References				
Blew et al. (2017), Jensen et al. (2017), Rijkswaterstaat (2015; 2016b; 2016c; 2016d; 2016a); PRW, 2019; <a href="https://www.sovon.nl/nl/gebieden">https://www.sovon.nl/nl/gebieden</a> ; Christianen et al. 2017				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		>80		
Information gap indicator		Information sufficient to score PI		
Overall Performance Indicator scores added from Client and Peer Review Draft Report				
Overall Performance Indicator score		80		
Condition number (if relevant)		-		

### PI 2.3.3 – ETP species information

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"> <li>- Information for the development of the management strategy;</li> <li>- Information to assess the effectiveness of the management strategy; and</li> <li>- Information to determine the outcome status of ETP species</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is <b>adequate to estimate</b> the UoA related mortality on ETP species.  <b>OR</b>  If RBF is used to score PI 2.3.1 for the UoA:  Qualitative information is <b>adequate to estimate productivity and susceptibility</b> attributes for ETP species.	Some quantitative information is <b>adequate to assess</b> the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.  <b>OR</b>  If RBF is used to score PI 2.3.1 for the UoA:  Some quantitative information is <b>adequate to assess productivity and susceptibility</b> attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the <b>magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status</b> of ETP species.
	Met?	Yes	Yes	No
Rationale				
For birds, the Joint Monitoring of Migratory Birds (JMMB) in the Wadden Sea, carried out in the framework of Trilateral Monitoring and Assessment Programme (TMAP), consists of (a) at least two synchronous, complete counts each year, (b) frequent (bi-monthly to monthly) spring tide counts at 60 counting sites, (c) additional three counts for geese (March, May, November), and (d) aerial counts for Eider in winter and for Shelduck during wing moult (July/August) in Germany and the Netherlands (Blew et al. 2017). As part of the TMAP, trilaterally coordinated surveys are also regularly conducted for seals in the Wadden Sea, the latest of which was in 2016 (Jensen et al. 2017). For harbour porpoise, there have been three major abundance surveys conducted in the North Sea, i.e. SCANS in 1994 and SCANS-II in 2005, and SCANS III				

in 2017 (Jensen et al. 2017). In The Netherlands, the 'Monitoring Waterstaatkundige Toestand des Lands' (MWTL) is a long-running program keeping track of (among other things) morphology, emissions and also biology (birds, seals, but also benthos). This program has incorporated specific monitoring for the N2000 targets. Partners in this monitoring program (e.g. SOVON for birds) report annually on numbers and trends (see e.g. <https://www.sovon.nl/nl/gebieden>). At UoA level, as a licence condition any direct interactions with marine mammals in suspended culture or SMCs have to be reported to the authorities. The other UoA impacts are indirect (as discussed in PI 2.3.1) and for this reason ETP population trends are closely monitored through various programmes such as the TMAP for the Wadden Sea (Jensen et al. 2017; Blew et al. 2017) and MWTL at national level in the Netherlands. Some quantitative information is therefore 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. **SG60 and SG80 are met. SG100 is not met** because the nature of UoA impacts (being indirect) prevents any impact study to be carried out with a high degree of certainty.

b	Information adequacy for management strategy			
	Guide post	Information is adequate to support <b>measures</b> to manage the impacts on ETP species.	Information is adequate to measure trends and support a <b>strategy</b> to manage impacts on ETP species.	Information is adequate to support a <b>comprehensive strategy</b> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a <b>high degree of certainty</b> whether a strategy is achieving its objectives.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
The results of the various monitoring programmes discussed in scoring issue (a) feed into the regular reviews of the Natura 2000 management plans and the implementation of the Mussel Transition Agreement, and enable analyses to be carried out as to whether the strategy is achieving its objective. Information is therefore adequate to measure trends and support a strategy to manage impacts on ETP species. <b>SG60 and SG80 are met. SG100 is not met</b> because the nature of UoA impacts (being indirect) prevents any impact study to be carried out with a high degree of certainty.				
References				
Blew et al. (2017), Jensen et al. (2017), MLNV (2004), Rijkswaterstaat (2016b; 2016c; 2016d; 2016e; 2016a)				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		>80		



Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	-

#### PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> 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?	<b>UoAs 1, 3 – Yes</b>  <b>UoA 2 – N/a</b>  <b>UoA 4 – Yes</b>	<b>UoAs 1, 3 – Yes</b>  <b>UoA 2 – N/a</b>  <b>UoA 4 – Yes</b>	<b>UoAs 1, 3 – No</b>  <b>UoA 2 – N/a</b>  <b>UoA 4 – Yes</b>
Rationale				
<p>See Section 6.4.6 for a detailed discussion on habitat designation. The following commonly encountered habitats were identified as interacting with the UoAs:</p> <ul style="list-style-type: none"> <li>Blue mussel beds (UoA 4)</li> <li>Sand, mud, muddy sand and sandy mud (UoAs 1, 3)</li> </ul> <p><b>UoA 1 - Seed mussel collection by suspended ropes and nets (Oosterschelde, Wadden Sea and Voordelta)</b></p> <p><b>UoA 3 - On-growing of mussels grown using suspended ropes, collection of harvest size mussels from suspended ropes (Oosterschelde, Voordelta, Veerse Meer and Grevelingenmeer)</b></p> <p>SMC and rope culture lines do not touch the substrate. Growth of some epifaunal organisms other than mussels may occur through fouling (e.g. sea squirts and barnacles). Some mussels and epifauna may fall to the bottom and this may modify the substrates below the farm area. SMCs and suspended culture have, however, the potential</p>				

to change habitats underneath the suspended mussels via biodeposition of 'mussel mud', potentially impacting both commonly encountered habitats listed above. This has been evaluated at the 'Mattenhaven' suspended culture site in the Oosterschelde (H&S Consultancy, 2014 in Gascoigne et al. (2016a), where it was found that there was little difference between the areas inside and outside the seed collectors, except for an increase in the abundance of macrofauna (crabs, starfish and others) under the collectors associated with clumps of mussels which had fallen off. These findings are in keeping with previous appropriate assessments that assessed this effect in the context of SMC installations (e.g. van de Mesel et al. (2009)). Kamermans et al., 2010 specifically concluded that within 1000 meters of SMCs in Wadden Sea and Oosterschelde no changes to the sea floor could be detected – samples were taken directly after installation and at highest biomass peak on the SMCs. In general, the highly energetic nature of the environment (strong tidal currents and sediment transport) would be expected to keep biodeposition under the SMCs and rope culture to a minimum. 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. Some localized biodeposition may occur, however, in sites that are less exposed. Several reviews have examined the environmental impacts of bivalve mariculture, most notably Kaiser et al. (1998) and Keeley et al. (2009). Keeley et al (2009) concluded that seabed effects (as a result of bio deposits and drop-off of shell and associated biota) are most pronounced directly beneath farm sites, reduce rapidly with distance, and are usually difficult to detect within 20-50m away. The most important factors influencing the magnitude of effects are water depth and current speeds; hence severity of effects is very much site-specific, and effects are minimised by locating farms in well-flushed areas, where species and habitats of special value are not present. Since impacts are difficult to detect outside of 20m – 50m from the site itself (Keeley et al, 2009), and have not been found in The Netherlands (Kamermans et al, 2010), any effect as a result of organic deposits is very localised. The effects of bio deposition are also thought to be temporary (Keeley et al, 2013): significant recovery is short term, occurring within the first few months of cessation of deposition. The benthos is mostly recovered in the medium to long term, within the timeframe of months to years.

The rope cultures and SMCs are kept in place by anchors, either post anchors or plough anchors. While these anchors could potentially impact the benthic habitat (sand/mud) on which they are placed, the negative impacts as a result of smothering are likely to be extremely localised, being limited to the immediate area of the benthos on which they are placed. The anchors may even form new habitat for species associated with hard substrate (as evidenced by the fouling on the anchors and lines), especially in the case of the year-round allowed rope cultures (SMCs are currently only allowed to be used between March-November). Overall, the spatial scale of any impacts is likely to be very limited.

As already explained, any new licence applications for suspended culture or SMC installations would also be subject to appropriate assessments where impacts of these types are considered.

Impacts may be more severe under the farms than the SMCs and stakeholder did mention reports from divers about sedimentation underneath structures. However, based on the information presented above it seems all impacts are highly localised, reversible and are unlikely to have an effect on this habitat type at the scale of the 'managed area'. Overall, these UoAs are considered highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. **SG60 and SG80 are met.** Given the limited scope of the Mattenhaven study and the fact it is now quite out of date, and the similarly out of date study into SMCs, **SG100 is not met.**

#### **UoA 2 - Seed mussel collection from wild beds by mussel dredge (Wadden Sea and Oosterschelde)**

No commonly encountered habitats are identified for this UoA. Blue mussel beds are considered as VMEs instead.

**UoA 4 - Seeding mussel seed and half-grown mussels on culture plots, collection of harvest size mussels from culture plots by dredging (Wadden Sea and Oosterschelde)**

For the culture plots, the presence of mussel causes changes to the sediment (deposition of fine, organic-rich mussel mud) and benthos (higher diversity, shift to deposit-feeding species). Studies on mussel culture plots in the Menai Strait, UK have shown the impact on natural community diversity was confined directly to the footprint of the mussel lays and there was no evidence of any effects propagating beyond the lays (Beadman et al. 2004). Given the low diversity of natural communities over which mussel bottom-culture plots are permitted, removal of the mussels would likely result in the restoration of natural habitats within a timescale at less than 5-20 years (SA3.13.4). In the Netherlands, it has been demonstrated that the culture plots are associated with increased localized biodiversity – for the Wadden Sea it has been shown that moving seed mussels to bottom culture plots enhances the total mussel biomass by 27% compared to a situation where no fisheries exist (Wijsman et al. 2014; Capelle et al. 2016b, cited in Craeymeersch & Jansen (2019)). This provides evidence that the UoA is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm of these mussel beds. **SG60, SG80 and SG100 are met.**

b	VME habitat status			
	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> 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?	<b>UoAs 1, 3, 4 – N/a</b>	<b>UoAs 1, 3, 4 – N/a</b>	<b>UoAs 1, 3, 4 – N/a</b>
		<b>UoA 2 - Yes</b>	<b>UoA 2 - Yes</b>	<b>UoA 2 - Yes</b>

**Rationale**

**UoA 1 - Seed mussel collection by suspended ropes and nets (Oosterschelde, Wadden Sea and Voordelta)**

**UoA 3 - On-growing of mussels grown using suspended ropes, collection of harvest size mussels from suspended ropes (Oosterschelde, Voordelta, Veerse Meer and Grevelingenmeer)**

**UoA 4 - Seeding mussel seed and half grown mussels on culture plots, collection of harvest size mussels from culture plots by dredging (Wadden Sea and Oosterschelde)**

No VME habitats were identified. This scoring issue is not relevant.

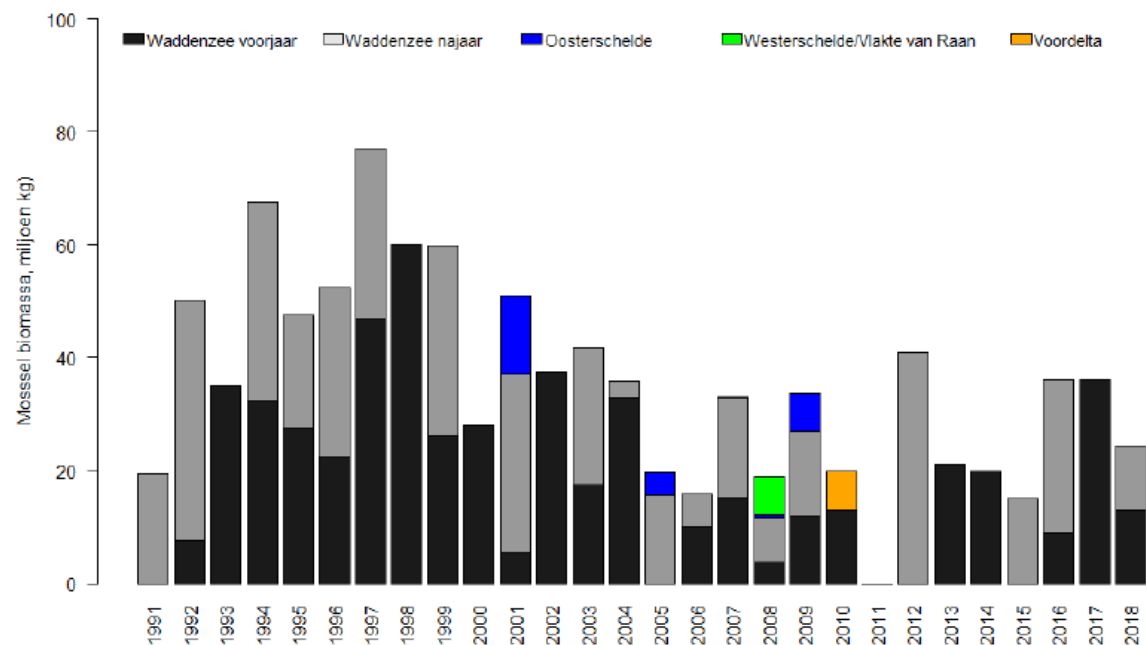
**UoA 2 - Seed mussel collection from wild beds by mussel dredge (Wadden Sea and Oosterschelde)**

See Section 6.4.6 for a discussion on why mussel beds were considered a VME for this UoA.

According to N2000 (2014), mussel beds may exist at different stages of development:

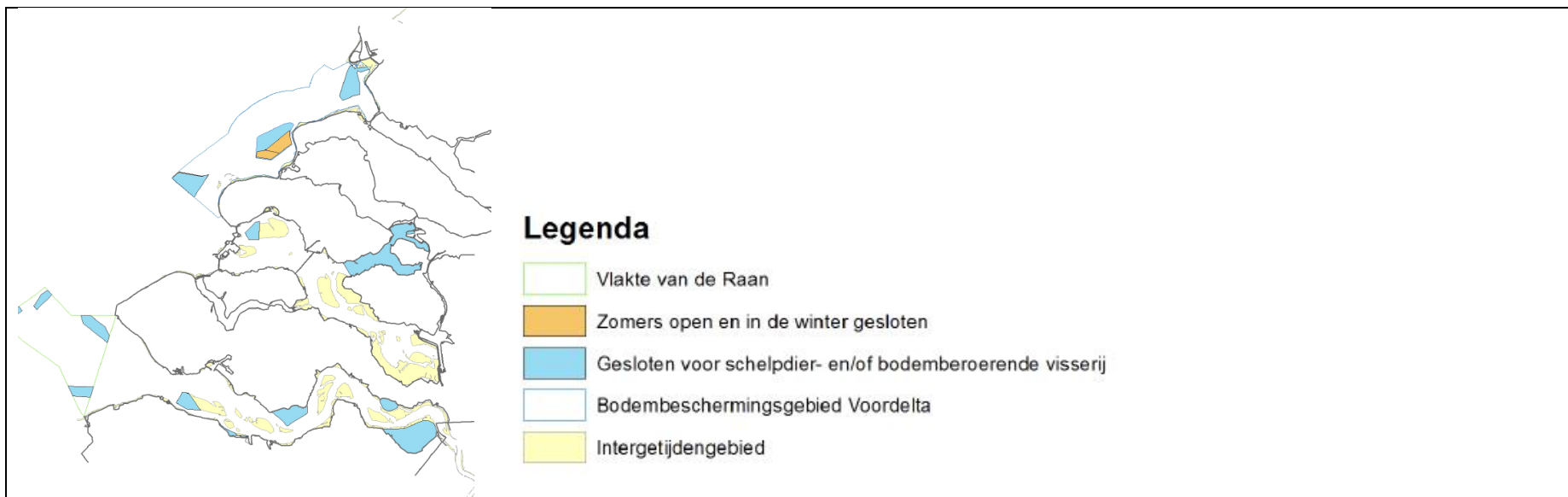
1. Mussel seed beds that occur on unstable locations, where the seed has little chance of surviving the first winter. This type of seed bed makes little to no contribution to the maintenance of mussel beds as a biogenic structure.
2. Mussel seed beds that occur on stable, sheltered locations where the seed has a high probability of survival.
3. Mussel beds where after the first winter, the seed has developed into half-grown mussels.
4. Mussel beds that are older than 2 winters, with presence of live and dead mussels in diverse life stages, and associated biodiversity of fauna and flora.

The mussel stock in the Oosterschelde is mainly formed by mussels on culture plots, most of which comes from the Wadden Sea and from SMCs. There are no natural multi-year mussel beds in the Oosterschelde, although some are found in littoral oyster beds [so-called mixed banks) and between the stones of the foreshore. An overview of mussel seed fished by area is given in Figure 12. Over the last 10 years, the seed fishery took place in the Wadden Sea only.



**Figure 12. Seed mussel production (in million kg) by area since 1991. Black and grey: spring and autumn fishery in the Wadden Sea, respectively. Coloured bars: southwest Delta areas. From Capelle (2019).**

The seed fishery predominantly targets type 1 (mussel seed beds that occur on unstable locations) in the autumn in order to maintain mussels throughout the winter – an autumn survey of unstable beds takes place each year to determine where to fish. However, the main impact has been identified to be the impact of the spring seed fishery on the development of stable subtidal mussel beds. Under the Transition Agreement, mussel beds in more stable areas in the Dutch Wadden Sea have been gradually excluded from the fishery – as of 2021 this concerns 36% of these beds. This will be gradually increased to 50% in 2022 and 65% in 2026. The intent is to achieve a 100% closure by 2029, but only if this is economically viable for the mussel sector. The closures prioritise areas where formation of stable, multi-year beds is most likely. In addition to these closures, there are also a number of closed areas throughout the Delta region, as shown in Figure 13, as well as the entire intertidal in the Dutch Wadden Sea (closed for the last 20 years), and Vlieter & Breezanddijk (Wadden Sea; closed for the last 10 years – however those beds disappeared after natural disturbances – Troost et al. (2019b)).



**Figure 13. Dutch Delta areas closed to the mussel seed fishery: Orange – closed from November to April; Blue – closed for all bottom contact gears (including shellfish fishery), Yellow – all of the intertidal closed to the mussel fishery. Green box shows the Natura 2000 area Vlakte van de Raan, blue box is the ‘bodembeschermingsgebied Voordelta’, an area where ‘heavy bottom trawling’ (defined as vessels fishing for demersal fish species with > 260 horsepower) is prohibited. From Capelle (2019).**

The potential impact of seed dredging in preventing stable mussel beds from forming in the subtidal was one of the components of the PRODUS project, which was completed in 2013 (Stralen et al. 2013; Smaal et al. 2013). the study found the following:

- There were no detectable differences between unfished and fished beds after the autumn fishery.
- Mussel density decreased on fished beds directly after the spring fishery on stable beds (i.e. that survived the 1<sup>st</sup> winter), but did not disappear completely. After 1.5 years, no differences could be found between fished and unfished beds, because in the majority of cases, mussels also tended to disappear from the unfished beds. The effects of the fishery on other benthic organisms were demonstrated in the short-term only (less than 1.5 years).
- In only three out of 37 locations did mussels survive for several years, including in both fished and unfished locations.
- The mussel seed fishery does not negatively affect the development of new seed beds (the study found that large-scale spat fall was less successful on multi-year beds, whereas small-scale spatfall did benefit from the presence of these beds). It is important to note here that a fished bed will typically have a remaining

mussel density of above 150g/m<sup>2</sup>, and higher densities were not found to promote spat fall, whether this is small or large-scale). Large-scale spat fall was thought to be more important for the development of new seed beds than small-scale spat fall.

- The effects of natural variability were considered more significant than those caused by the fishery.

This research provides the logic as to why the mussel transition agreement focuses on replacing the spring seed mussel fishery with alternative seed sources, as discussed under ETP species. The PRODUS project provides evidence that the seed fishery is highly unlikely to reduce structure and function of subtidal mussel beds to a point where there would be serious or irreversible harm. **SG60, SG80 and SG100 are met.** Note that overlap between these UoAs and sand, mud, muddy sand and sandy mud habitats are unlikely as mussel beds are specifically targeted – this habitat type was therefore not assessed here.

Note: SA3.13.4L *The team shall interpret “serious or irreversible harm” as reductions in habitat structure and function such that the habitat would be unable to recover at least 80% of its structure and function within 5-20 years if fishing on the habitat were to cease entirely. (...) In the case of VMEs the team shall interpret “serious or irreversible harm” as reductions in habitat structure and function below 80% of the unimpacted level.* Also, the following MSC interpretation applies on consideration of short recovery times (<5years) for VMEs: <https://mscportal.force.com/interpret/s/article/habitat-recovery-time-SA3-13-4-1-1527262008262>.

c	Minor habitat status		
	Guide post		There is <b>evidence</b> 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?		<b>N/a</b>
Rationale			
No minor habitats were identified. This scoring issue is not relevant.			
References			
Beadman et al. (2004), Gascoigne et al. (2016a), van Stralen et al. (2013), de Mesel et al. (2009), Kamermans et al., 2010; Kaiser et al, 1998; Keeley et al, 2009; Keeley et al, 2013, Capelle (2019) and Troost et al. (2019b); <a href="https://mscportal.force.com/interpret/s/article/habitat-recovery-time-SA3-13-4-1-1527262008262">https://mscportal.force.com/interpret/s/article/habitat-recovery-time-SA3-13-4-1-1527262008262</a> .			
Draft scoring range and information gap indicator added at Announcement Comment Draft Report			
Draft scoring range		>80	



Information gap indicator	Information sufficient to score PI
Data-deficient? (Risk-Based Framework needed)	No
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>UoA 1, 3 – 80</b>  <b>UoA 2, 4 – 100</b>
Condition number (if relevant)	-

#### PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a <b>partial strategy</b> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a <b>strategy</b> in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
Any new licence applications for suspended culture or SMC installations (UoAs 1, 3) are subject to appropriate assessments where any relevant impacts are considered by independent experts to ensure that N2000 nature conservation targets are not negatively impacted. New areas for either suspended culture or SMCs are subject to additional scrutiny by the competent authority, and as a result the amount of suspended culture as part of UoA 3 has not changed since previous assessment, as no suitable new areas have been agreed on. For the SMCs (UoA 1), the addendum to the Mussel Transition Agreement (December 2020) made an update on the SMC-				

policy possible. The new policy runs from 2021-2026 and details the areas where SMCs are allowed, the maximum areal allowed for SMCs in each of the areas, and rules to ensure that the interests of nature, archaeology and other users in the areas are taken care of (Ministry LNV, 2020d).

There is an explicit strategy for mitigating the habitat impacts of dredging of wild seed beds (UoA 2) which consists of the Mussel Transition Agreement and its associated implementation plan (see 2.3.1c for detail). As explained under PI 2.3.1, this is being implemented with SMC production increasing and wild bottom seed decreasing. Closures prioritise areas which have tended to form stable beds (by focusing on closures of the areas used by the spring fishery). The implementation of the strategy takes account of the fact that spatfall in a given year is variable in time and place – there is flexibility to account for the fact that by chance it may happen that all spatfall occurs in closed areas – but once closed, areas remain closed. Additional management in place includes several other closed areas throughout the Wadden Sea and Delta areas (see 2.4.1b). Routine monitoring also takes place on wild beds, both before (autumn) and after fishing (spring). The relaying of seed on culture plots (UoA 4) happens on specific locations in the UoA area and is restricted to the subtidal. The current plots were assessed and are now included in the Natura 2000 management plans, the new plots (part of the optimisation of the culture plots) have to be assessed against the Natura 2000 qualifying features, and for this an appropriate assessment has been drafted.

Overall, there is a strategy in place for managing the impact of the MSC UoAs on the commonly encountered habitats and therefore, **SG60, SG80 and SG100 are met**. Note that all Dutch mussel fisheries are part of this assessment.

b	Management strategy evaluation			
	Guide post	The measures are <b>considered likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>Any new licence applications for suspended culture or SMC installations (UoAs 1, 3) are subject to appropriate assessments where any relevant impacts are considered by independent experts to ensure that N2000 nature conservation targets are not negatively impacted. In relation to culture plots, it has been demonstrated that these are associated with increased localized biodiversity – for the Wadden Sea it has been shown that moving seed mussels to bottom culture plots enhances the total mussel biomass by 27% compared to a situation where no fisheries exists (Wijsman et al. 2014; Capelle et al. 2016b, cited in Craeymeersch &amp; Jansen (2019)); this, combined with the fact that any impacts are restricted to the lays and are reversible (Beadman et al. 2004), provides an objective basis for confidence that the strategy will work. The PRODUS study (van Stralen et al., 2013)), compared open and closed plots on the wild seed beds, and showed that the spatfall targeted by the autumn fishery is not likely to develop into persistent beds, but the spring fishery may have observable impacts for up to 2 years or so (although very few beds persist long-term). The Mussel Transition Agreement aims to stop fishing on wild seed beds altogether but has focused on the spring seed fishery which has the greatest impact on wild stable beds. There is therefore an objective basis for confidence that the process set out in the Transition Agreement will work, <b>SG60 and SG80 are met</b>. Nonetheless, the overall</p>				

beneficial effect of the area closures on development of multi-year beds and biodiversity has yet to be demonstrated (Troost et al. 2019b) and so far, only 36% of stable areas have been closed (despite the fact that a Transition Agreement has been in place for 12 years). High confidence is therefore lacking and <b>SG100 is not met</b> .				
c	Management strategy implementation			
	Guide post		There is <b>some quantitative evidence</b> that the measures/partial strategy is being implemented successfully.	There is <b>clear quantitative evidence</b> that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		<b>Yes</b>	<b>No</b>
Rationale				
<p>The process for appropriate assessments in the case of suspended culture and SMC installations, the black box system (which closely monitors all fishing locations of PO members), and the lack of transgressions (see Sieben, 2018; Sieben, 2019, Seip, 2020) all provide clear quantitative evidence that the strategy is being implemented successfully. There is also evidence that the Transition Agreement is being implemented successfully (annual surveys since 2011 show increased SMC production and reduced wild bottom seed production - see Figure 9); however, the transition process is behind the initial 2008 schedule (see discussion in 2.3.1c). The N2000 management plan (Rijkswaterstaat 2016e) nevertheless acknowledges the need for an adaptive approach and a new Agreement was set up at the end of 2020 (see 2.3.1c discussion). Overall, there is some quantitative evidence that the strategy is being implemented successfully and <b>SG80 is met</b>. Because of the delays in the implementation of the original Transition Agreement, however, <b>SG100 is not met</b>.</p>				
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
	Guide post	There is <b>qualitative evidence</b> that the UoA complies with its management requirements to protect VMEs.	There is <b>some quantitative evidence</b> 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 <b>clear quantitative evidence</b> that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	<b>N/a</b>	<b>N/a</b>	<b>N/a</b>
Rationale				

There are no management requirements or protection measures afforded to wild mussel beds by other MSC UoAs/non-MSC fisheries in the Netherlands. This scoring issue is not relevant.	
References	
Beadman et al. (2004), Craeymeersch & Jansen (2019), Rijkswaterstaat (2016e), Sieben, 2018; Sieben, 2019; Seip, 2020; Stralen et al. (2013); Troost et al. (2019b)	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	<b>&gt;80</b>
Information gap indicator	<b>Information sufficient to score PI</b>
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>85</b>
Condition number (if relevant)	-

### 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			
	Guide post	<p>The types and distribution of the main habitats are <b>broadly understood</b>.</p> <p><b>OR</b></p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and <b>vulnerability</b> of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p><b>OR</b></p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
	Met?	Yes	Yes	Yes
Rationale				
<p>The benthic macrofauna of all Dutch waters have been subject to the monitoring programme <i>Monitoring Waterstaatkundige Toestand des Lands</i> (MWTL) since 1990, which is being carried out to meet the monitoring requirements of Natura 2000, the EU Water Framework Directive and Marine Strategy Framework Directive as well as OSPAR and TMAP (<a href="https://waterinfo-extra.rws.nl/monitoring/biologie/">https://waterinfo-extra.rws.nl/monitoring/biologie/</a>), with data publicly available online (<a href="https://waterinfo-extra.rws.nl/monitoring/biologie/bodem dieren/">https://waterinfo-extra.rws.nl/monitoring/biologie/bodem dieren/</a>). The locations of wild subtidal mussel beds are mapped every autumn and spring (van Stralen et al, 2019a and b) and the location of the culture plots is also known, with the biomass of mussels on the plots also estimated every spring (van Stralen et al, 2019a). The distribution of all habitats is thus known over their range, thus <b>SG60 and SG80 are met</b> with particular attention to the occurrence of vulnerable habitats, thus <b>SG100 is also met</b>.</p>				
b	Information adequacy for assessment of impacts			

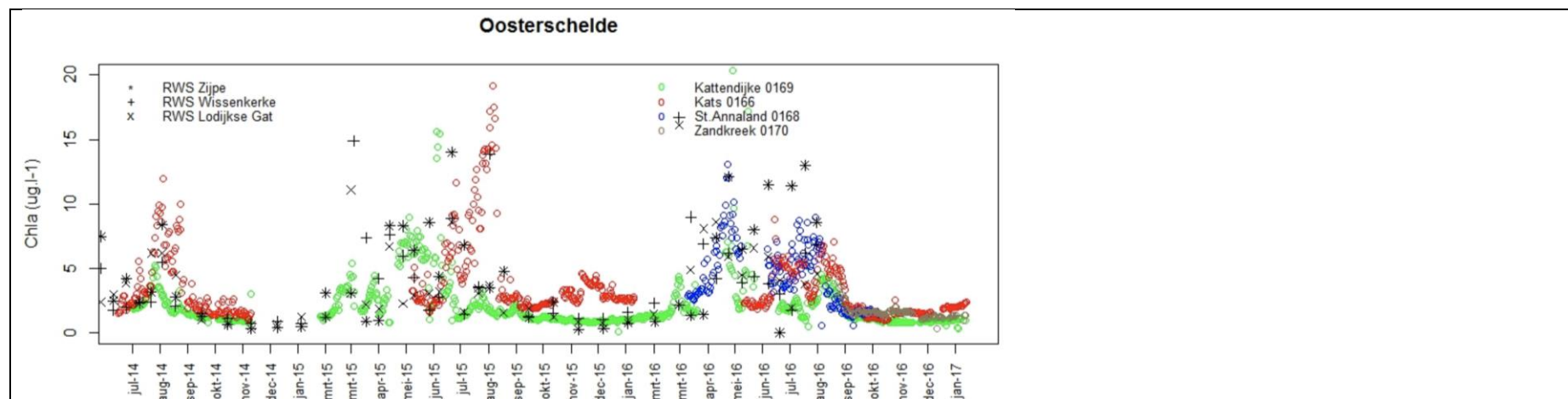
	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.  <b>OR</b>  If CSA is used to score PI 2.4.1 for the UoA:  Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.  <b>OR</b>  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.	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	Yes	Yes	No
Rationale				
The nature of the impact on the relevant habitat types has been evaluated and to some extent quantified, as described in 2.4.1. There is reliable information on the spatial and temporal extent of interaction via the black boxes. <b>SG60 and SG80 are met.</b> It cannot be said, however, that the physical impacts of the gear have been quantified 'fully', although it has in some cases as described in PI 2.4.1. <b>SG100 is not met in full.</b>				
c	Monitoring			
	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		Yes	Yes
Rationale				
The main habitat type, which is likely to change over time, is the seed mussel beds; the distribution of this habitat type is monitored on a regular basis, as described above, and see for example (van Stralen, 2019). Changes in the culture plots are also monitored. The fishery has not been shown to cause significant changes to any other				

habitat types (subtidal sand and mud) which are widely distributed and are monitored as part of the <i>Monitoring Waterstaatkundige Toestand des Lands</i> (MWTL) programme. <b>SG80 and SG100 are met.</b>	
References	
<a href="https://waterinfo-extra.rws.nl/monitoring/biologie/">https://waterinfo-extra.rws.nl/monitoring/biologie/</a> <a href="https://waterinfo-extra.rws.nl/monitoring/biologie/bodemdieren/">https://waterinfo-extra.rws.nl/monitoring/biologie/bodemdieren/</a> Van Stralen, 2019van Stralen et al, 2019a and b	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	<b>&gt;80</b>
Information gap indicator	<b>Information sufficient to score PI</b>
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>95</b>
Condition number (if relevant)	-

### PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is <b>unlikely</b> 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 <b>highly unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <b>evidence</b> 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?	<b>UoAs 1, 3 – Yes</b>  <b>UoAs 2, 4 - Yes</b>	<b>UoAs 1, 3 – Yes</b>  <b>UoAs 2, 4 - Yes</b>	<b>UoAs 1, 3 – Yes</b>  <b>UoAs 2, 4 - No</b>
Rationale				
<p>The fishery's impacts on the target, bycatch, ETP species and habitats have already been discussed and are not repeated here.</p> <p><b>UoA 1 - Seed mussel collection by suspended ropes and nets (Oosterschelde, Wadden Sea and Voordelta)</b></p> <p><b>UoA 3 - On-growing of mussels grown using suspended ropes, collection of harvest size mussels from suspended ropes (Oosterschelde, Voordelta, Veerse Meer and Grevelingenmeer)</b></p> <p>The key ecosystem element that may be affected by the suspended culture and SMC UoAs is the carrying capacity, as both UoAs increase the presence of mussels in the ecosystem. Indicators for carrying capacity are regularly monitored by Wageningen Marine Research who determine trends based on the average meat yield per year in harvested mussels and the annual growth of cockles as determined from stock assessments. The most recent assessment was carried out by Kamermans &amp; Asch (2018) who found that for both the Wadden Sea and Oosterschelde, these indicators fluctuate in space and time but show no overall trend. The Hogeschool Zeeland (HZ) has conducted measurements of chlorophyll-a as a measure of algal concentrations along several points in the Oosterschelde associated with shellfish culture (both oysters and mussels) for several years (see Figure 14). This shows the annual fluctuations in food for filter feeders, and also that productivity returns to more or less the same baseline each year, without a downward trend, indication no detrimental effect on the carrying capacity. These measurements will be continued for the foreseeable future, with additional data provided by Rijkswaterstaat, from the aforementioned MWTL-program.</p>				





**Figure 14. Daily average of chlorophyll-a (ug/l) at different locations in the Oosterschelde**  
[https://www.deltaexpertise.nl/wiki/index.php/BU\\_Data\\_over\\_de\\_omgevingsfactoren\\_VN](https://www.deltaexpertise.nl/wiki/index.php/BU_Data_over_de_omgevingsfactoren_VN)

A more comprehensive study on this topic was recently carried out by Jansen et al. (2019) based on 1990-2016 data for the Wadden Sea and Oosterschelde. The current data shows no indications of overgrazing, or that either the productivity of the areas or the available food for filter feeders have been negatively impacted (Jansen et al., 2019).

There is therefore evidence that these UoAs are highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. **SG60, SG80 and SG100 are met.**

#### **UoAs 2, 4 - Seed mussel collection from wild beds and harvest size mussel collection from culture plots by mussel dredge (Wadden Sea and Oosterschelde)**

The effects of the UoA on seed mussel beds as a habitat have already been assessed and are not repeated here. The effect of the fishery at the ecosystem level is essentially to move organisms (mussels and associated fauna) around, on a local level, leading to localised changes in biodiversity (considered the key ecosystem element here), rather than to affect overall biomass and species composition in any significant, negative way. As shown by Craeymeersch & Jansen (2019), the culture plots create local biodiversity hotspots. On that basis, these UoAs are highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. **SG60 and SG80 are met.** In this context, the team also considered the Mussel Transition Agreement, which, although already discussed in relation to ETP species and habitats, is relevant to the wider ecosystem. Whilst there is evidence that the agreement is being implemented successfully, the transition process is behind the initial 2008 schedule. Although the N2000 management plan (Rijkswaterstaat 2016e) acknowledges the need for an adaptive approach,

there is no clear end date for implementation of the agreement. The evidence to state 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 is therefore lacking. <b>SG100 is not met.</b>	
References	
Craeymeersch & Jansen (2019), Kamermans & Asch (2018) and Stralen et al. (2013); Jansen et al. (2019) <a href="https://www.deltaexpertise.nl/wiki/index.php/BU_Data_over_de_omgevingsfactoren_VN">https://www.deltaexpertise.nl/wiki/index.php/BU_Data_over_de_omgevingsfactoren_VN</a> .	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	Information sufficient to score PI
Data-deficient? (Risk-Based Framework needed)	No
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	UoAs 1, 3 – 100  UoAs 2, 4 – 80
Condition number (if relevant)	-

### PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary which take into account the <b>potential impacts</b> of the UoA on key elements of the ecosystem.	There is a <b>partial strategy</b> in place, if necessary, which takes into account <b>available information and is expected to restrain impacts</b> of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a <b>strategy</b> that consists of a <b>plan</b> , in place which contains measures to <b>address all main impacts of the UoA</b> on the ecosystem, and at least some of these measures are in place.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
<p>All UoA areas have a fully implemented strategy that consists of a plan, which aims to address any fishery impacts on Natura 2000 nature conservation targets:</p> <ul style="list-style-type: none"> <li>Natura 2000 Deltawateren Beheerplan 2016-2022 – Oosterschelde, Veerse Meer, Grevelingen (Rijkswaterstaat 2016b; Rijkswaterstaat 2016c; Rijkswaterstaat 2016a)</li> <li>Natura 2000 Beheerplan 2015-2021 – Voordelta (Rijkswaterstaat 2015)</li> <li>Natura 2000 Beheerplan 2016-2022 – Waddenzee (Rijkswaterstaat 2016d)</li> </ul> <p>For those activities that are not covered by the management plans, appropriate assessments have to be carried out, demonstrating that these targets will not be negatively impacted. On that basis, 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. <b>SG60, SG80 and SG100 are met.</b></p>				
b	Management strategy evaluation			
	Guide	The <b>measures</b> are considered likely to work, based on plausible argument (e.g., general	There is <b>some objective basis for confidence</b> that the measures/ partial strategy will work,	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/ strategy will work, based on

	post	experience, theory or comparison with similar UoAs/ ecosystems).	based on some information directly about the UoA and/or the ecosystem involved.	information directly about the UoA and/or ecosystem involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>The measures set out in scoring issue a are based on best available science, with some agreed in collaboration with eNGOs (e.g. Mussel Transition Agreement). For any activity not covered by the Natura 2000 management plan, appropriate assessments are carried out by independent experts and ensure that the activities do not negatively affect N2000 conservation targets. On that basis, there is an objective basis for confidence that the strategy will work. Routine monitoring of carrying capacity for the Wadden Sea and Oosterschelde (e.g. Kamermans &amp; Asch (2018)), regular surveys of wild seeds beds and culture plots biomass (e.g. van Stralen, 2019;van Stralen et al, 2019a and b), and ad hoc analyses of biodiversity trends in the context of these fisheries (e.g. Craeymeersch &amp; Jansen (2019)), all provide an objective basis for confidence that the strategy will work. <b>SG60 and SG80 are met.</b> Not all aspects of the ecosystem are as well understood, however. For example it remains unclear why some bird populations including eider ducks continue to decline (Blew et al. 2017) and whether underlying ecosystem effects may be a factor. It can therefore not be said that testing supports high confidence that the strategy will work. <b>SG100 is not met.</b></p>				
c	Management strategy implementation			
	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a).</b>
	Met?		<b>Yes</b>	<b>No</b>
Rationale				
<p>Any operational requirements for suspended seed installations and SMCs are laid out in the licences and are subject to inspections, while adherence to N2000 requirements (such as keeping sufficient distance from birds and seals) is verified with the black box system by the PO. Whilst there is evidence that the Transition Agreement is being implemented successfully (annual surveys since 2011 show increased SMC production and reduced wild bottom seed production - see <b>Error! Reference source not found.</b>), the team noted that the transition process is behind the initial 2008 schedule. Although the N2000 management plan (Rijkswaterstaat 2016d) acknowledges the need for an adaptive approach, there is no clear end date for implementation of the agreement. Although this matter has already been discussed</p>				

under ETP species, the team considers it relevant to the ecosystem component overall since its effects are not limited to eider ducks alone. Overall, while there is some evidence that the strategy is being implemented successfully, there is no clear evidence that this is the case. <b>SG80 is met but not SG100.</b>	
References	
Blew et al. (2017), Craeymeersch & Jansen (2019), Kamermans and van Asch (2018), Rijkswaterstaat (2015; 2016b; 2016c; 2016d; 2016a), Stralen et al. (2013); van Stralen, 2019; van Stralen et al, 2019a and b	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	85
Condition number (if relevant)	-

### PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to <b>identify</b> the key elements of the ecosystem.	Information is adequate to <b>broadly understand</b> the key elements of the ecosystem.	
	Met?	<b>Yes</b>	<b>Yes</b>	
Rationale				
<p>The Dutch monitoring programme <i>Monitoring Waterstaatkundige Toestand des Lands</i> (MWTL) is being carried out to meet <i>inter alia</i> the monitoring requirements of Natura 2000, the EU Water Framework Directive and Marine Strategy Framework Directive as well as OSPAR and TMAP and compiles data on seabed morphology, physical processes and parameters (e.g. currents, temperature, salinity), chemistry, biology (plankton, benthos and other marine fauna and flora including birds, fish and mammals), water quality and pollution (<a href="https://waterinfo-extra.rws.nl/monitoring/">https://waterinfo-extra.rws.nl/monitoring/</a>). The ongoing research by Wageningen University &amp; Research on carrying capacity (e.g. Kamermans &amp; Asch (2018) and monitoring of wild and cultured mussel beds (van Stralen, 2019; van Stralen et al, 2019a and b), means that the information is adequate to broadly understand the key elements of the ecosystem; <b>SG60 and SG80 are met.</b></p>				
b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but <b>have not been investigated</b> in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and <b>some have been investigated in detail.</b>	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and <b>have been investigated in detail.</b>
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
<p>The main impacts of the suspended culture and SMCs installation on carrying capacity are subject to routine monitoring (e.g. Kamermans and van Asch, 2018). Furthermore, any other impacts are assessed systematically through appropriate assessments when a new licence is applied for. For seed mussel and bottom culture</p>				

fisheries, any resulting changes in biodiversity have been investigated in detail through the PRODUS Project (van Stralen et al., 2013) and more recently by Craeymeersch & Jansen (2019). Ongoing surveys (see Section 6.4.1 for a summary) give a clear understanding of the ecosystem status in relation to spatfall, mussel biomass and distribution (natural and culture plots), density of main predators on the mussel beds, persistence of beds (open and closed) and species associated with the culture plots and hanging culture (via the SASI system). On that basis, the main interactions between the UoA on these ecosystem elements (including carrying capacity and biodiversity) can be inferred from existing information and have been investigated in detail. **SG60, SG80 and SG100 are met.**

c	Understanding of component functions			
	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are <b>known</b> .	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 <b>understood</b> .
	Met?		<b>Yes</b>	<b>No</b>

#### Rationale

The impact of the fishery on mussel biomass and distribution is well known, since the biomass on the culture plots, SMCs and suspended culture installations is monitored regularly (van Stralen, 2019; van Stralen et al, 2019a and b), and the impact of fishing on the biomass and persistence of seed beds has also been studied by the PRODUS project (van Stralen et al., 2013). The potential impacts of the fishery on primary, secondary and ETP species are evaluated elsewhere under Principle 2 and the main functions of these components in the ecosystem are known. However, as stated under 2.5.2, it remains unclear why some bird populations including eider ducks continue to decline (Blew et al. 2017) and whether underlying ecosystem effects may be a factor. For this reason, **SG100 is not met.**

d	Information relevance			
	Guide post		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 <b>and elements</b> to allow the main consequences for the ecosystem to be inferred.
	Met?		<b>Yes</b>	<b>Yes</b>

#### Rationale

As already explained, adequate information is available on the impacts of the UoA on the Principle 2 components and ecosystem elements (through the PRODUS project, SASIs, ongoing monitoring under the TMAP and MWTL programmes, monitoring of carrying capacity) so that the main consequences for the ecosystem can be inferred. **SG80 and SG100 are met.**

e	Monitoring			
	Guide post		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?		Yes	Yes
Rationale				
The Dutch monitoring programme <i>Monitoring Waterstaatkundige Toestand des Lands</i> (MWTL) is being carried out to meet <i>inter alia</i> the monitoring requirements of Natura 2000, the EU Water Framework Directive and Marine Strategy Framework Directive as well as OSPAR and TMAP and compiles data on seabed morphology, physical processes and parameters (e.g. currents, temperature, salinity), chemistry, biology (plankton, benthos and other marine fauna and flora including birds, fish and mammals), water quality and pollution ( <a href="https://waterinfo-extra.rws.nl/monitoring/">https://waterinfo-extra.rws.nl/monitoring/</a> ). The ongoing research by Wageningen University & Research on carrying capacity (e.g. HZ and MWTL) and monitoring of wild and cultured mussel beds means that adequate data continue to be collected to detect any increase in risk level and these are adequate to support the development of strategies to manage ecosystem impacts as per N2000 framework. <b>SG80 and SG100 are met.</b>				
References				
Blew et al. (2017), Craeymeersch & Jansen (2019), Kamermans and van Asch (2018), Rijkswaterstaat (2015; 2016b; 2016c; 2016d; 2016a), Stralen et al., 2013, van Stralen, 2019; van Stralen et al, 2019a and b.				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		>80		
Information gap indicator		Information sufficient to score PI		
Overall Performance Indicator scores added from Client and Peer Review Draft Report				
Overall Performance Indicator score		95		



Condition number (if relevant)	-
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### PI 2.6.1 – Translocation outcome

PI 2.6.1		The translocation activity has negligible discernible impact on the surrounding ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	Impact of translocation activity			
	Guidepost	The translocation activity is unlikely to introduce diseases, pests, pathogens, or non-native species (species not already established in the ecosystem) into the surrounding ecosystem.	The translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	There is evidence that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.
	Met?	Yes	Yes	Yes
	Justification	<p>The key risk associated with translocation activities is the introduction of non-native species into the Oosterschelde. To manage this risk, a Shellfish Import Monitoring Protocol (SIMP) was developed by GiMaRIS (Gittenberger, 2018), which consists of a three-yearly SASI (Shellfish-dependent species inventory), i.e. a species inventory of samples taken in situ at the source fishery, combined with a 'Big Bag' species inventory (BB), involving sampling of the Big Bags of mussels upon arrival in Yerseke (before relaying into the Oosterschelde). For the BB inventory, 2-3 samples per region per import were taken at the time of initial assessment – since then, however the sampling protocol has been revised and sampling is now carried out for 2.5% of all imports from a given source fishery. Currently, this still equates to roughly 2-3 samples per source region. The sampling is being carried out from January-June and July-December, the results of which feed into a risk-based assessment process, which can stop imports or can increase (or reduce) the level of sampling in response to the perceived risk of undesirable introductions. Undesirable in the context of the SIMP is where a species is considered to negatively impact the Natura 2000 conservation goals for the Oosterschelde. The results are also sent to the Ministry of LNV as part of the import licence conditions. Within the SIMP, there is a provision in the event where an undesirable species is detected for a certain source area, but imports from this area have occurred up to 3 months prior to this detection, then the plots where those mussels were relaid have to be fished clean, with all organisms disposed of to prevent re-entry into the Oosterschelde (Gittenberger, 2018). Since the initial assessment, none of the species identified in the SASIs and BBs have been considered to be problematic for the Oosterschelde (Gittenberger et al, 2020, 2019a-d, 2018, 2017 a-f).</p>		

PI 2.6.1	The translocation activity has negligible discernible impact on the surrounding ecosystem.
	<p>In addition to the SIMP, each translocation activity requires a Nature Conservation (Natura2000) licence from the Ministry of LNV. This is because the Oosterschelde is a Natura 2000 site designated as both a Special Area for Conservation (SAC) under the EC Habitats Directive and a Special Protection Area (SPA) under the EC Birds Directive. As a part of the licence application process, an Appropriate Assessment (AA) has to be carried out which consists of a risk assessment derived from the SIMP (SASIs and BBs) for each source area. Each licence is valid for four years. In 2018, the licences for several Irish and UK areas (Exmouth, Glengarriff, Morecambe Bay, Swansea Bay, Waterford Harbour and Youghal Bay: licence nr: DGAN-NB/18148570), as well as the Danish area of Jutland (licence nr: DGAN-NB/18148384) were renewed. In 2019, only the licence for the UK area River Dee (licence nr: DGNVLG / 19029669) was renewed. No sanctions have been issued or licences withdrawn since the initial assessment (see Sieben, 2018 and 2019; Seip, 2020).</p> <p>In the early 2000s, there have been introductions of two oyster drill species: the Atlantic oyster drill (<i>Urosalpinx cinerea</i>) and the Japanese oyster drill (<i>Ocenebra inornata</i>). Both introductions were linked to imports of shellfish (oysters in the case of the Japanese oyster drill and both oysters and mussels in the case of the Atlantic species). The Atlantic oyster drill is present in only a few localised areas in the Oosterschelde and is still considered a 'problem species' under the SIMP. The Japanese oyster drill, however, is now relatively widespread within Europe and has become established within the Oosterschelde. This species is no longer considered a 'problem species' under the monitoring protocol. It is worth noting here that the introduction of the Japanese oyster drill predates the implementation of the SIMP and the first initial assessment of this fishery.</p> <p>SASIs also continue to be carried out in the Oosterschelde itself (as part of the import protocol into the Wadden Sea), with no problem species detected to date (e.g. Gittenberger et al. (2018)).</p> <p>In relation to diseases and pathogens, microscopic organisms are not covered by the translocation management system, but are covered by other national and EU regulations relating to shellfish toxicity and food health. Two examples can be given: the oyster pathogen <i>Bonamia</i> is present in some shellfish areas around Europe, and in order to avoid spreading it to other areas it is an EU requirement (Commission Decision of 31 October 2008 implementing Council Directive 2006/88/EC as regards surveillance and eradication programmes and disease-free status of Member States, zones and compartments) to have in place a monitoring system, with 'Bonamia containment zones' established where <i>Bonamia</i> is detected. Although mussels are not susceptible to <i>Bonamia</i> and do not act as reservoirs, all shellfish movement from inside to outside these containment zones is strongly restricted. The Oosterschelde is, however, inside a containment zone (<i>Bonamia</i> is present) so these restrictions do not apply.</p> <p>In relation to water quality and toxic algae, there is a Europe-wide standardised testing programme for shellfish waters, under Directive 2006/113/EC (the Shellfish Waters Directive), which since 2013 is incorporated in the Water Framework Directive <a href="#">(2000/60/EG)</a>. It has happened that source areas have been closed because toxic algae were detected – e.g. in Castlemaine Harbour. The testing and closure are the responsibility of national authorities in the source area.</p>

<b>PI 2.6.1</b>		<b>The translocation activity has negligible discernible impact on the surrounding ecosystem.</b>
		Overall, it is considered that the translocation activity is highly unlikely to introduce diseases, pests, pathogens or non-native species (not already present) into the Oosterschelde, and that there is evidence that this is the case – not only because there has not so far been an introduction since the implementation of the SIMP (although a contingency plan is in place should one be detected), but also because in cases where problem species or pathogens have been detected, the management systems in place have worked to ensure that there was no introduction. <b>SG60, SG80 and SG100 are met.</b>
References		Gittenberger, 2018; Gittenberger et al, 2020, 2019a-d, 2018, 2018a, 2017 a-f, Sieben, 2018 and 2019; Seip, 2020
Draft scoring range and information gap indicator added at Announcement Comment Draft Report		
Draft scoring range		<b>&gt;80</b>
Information gap indicator		<b>Information sufficient to score PI</b>
Overall Performance Indicator scores added from Client and Peer Review Draft Report		
Overall Performance Indicator score		<b>100</b>
Condition number (if relevant)		-

## PI 2.6.2 – Translocation management

PI 2.6.2		There is a strategy in place for managing translocations such that the fishery does not pose a risk of serious or irreversible harm to the surrounding ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	Translocation management strategy in place			
	Guidepost	There are measures in place which are expected to protect the surrounding ecosystem from the translocation activity at levels compatible with the SG80 Translocation outcome level of performance (PI 2.6.1).	There is a partial strategy in place, if necessary, that is expected to protect the surrounding ecosystem from the translocation activity at levels compatible the SG80 Translocation outcome level of performance (PI 2.6.1).	There is a strategy in place for managing the impacts of translocation on the surrounding ecosystem.
	Met?	Yes	Yes	Yes
	Justification	The team considered that there is a strategy in place to manage the impacts of translocation, consisting of a risk-assessment system and ongoing monitoring which has successfully avoided any introduction of problem species to the Oosterschelde, as well as an EU-wide system of monitoring for shellfish diseases and toxic algae, discussed in PI 2.6.1. Since there is a strategy in place, <b>SG60, SG80 and SG100 are met.</b>		
b	Translocation 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).	A valid documented risk assessment or equivalent environmental impact assessment demonstrates that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.	An independent peer-reviewed scientific assessment confirms with a high degree of certainty that there are no risks to the surrounding ecosystem associated with the translocation activity.
	Met?	Yes	Yes	No

PI 2.6.2		There is a strategy in place for managing translocations such that the fishery does not pose a risk of serious or irreversible harm to the surrounding ecosystem.		
	Justification	<p>A peer-reviewed risk assessment was carried out by Wijsman &amp; Smaal (2006) as reported on during the initial assessment. The risk assessment concluded that risks to the ecosystem were small but not absent and the Schelpdier Import Monitoring Protocol - SIMP (Gittenberger 2015) was subsequently developed. Each licence application must also be accompanied by an appropriate assessment that is prepared on the basis of the SASI/Big Bag sampling carried out by GiMaRIS, and is subject to government and stakeholder review.</p> <p>On this basis, the team considered that the risk assessment, ongoing SASIs and big bag sampling as part of the SIMP, plus appropriate assessment process show that introductions are 'highly unlikely' (<b>SG60 and SG80 are met</b>); but it cannot be said (and the risk assessment does not say) that there are no risks (<b>SG100 is not met</b>).</p>		
c	Translocation management strategy implementation			
	Guidepost		Contingency measures have been agreed in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation.	A formalised contingency plan in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation is documented and available.
	Met?		Yes	Yes
	Justification	Within the SIMP, there is a provision in the event where an undesirable species is detected for a certain source area, but imports from this area have occurred up to 3 months prior to this detection, then the plots where those mussels were relaid have to be fished clean, with all organisms disposed of to prevent re-entry into the Oosterschelde (Gittenberger 2015). In this event, the licence would also be immediately suspended for the specific source area and this is formalised in the licence conditions. Overall, the team considered that this constitutes a 'formalised contingency plan', hence <b>SG80 and SG100 are met</b> .		
References		Gittenberger (2015), Gittenberger et al. (2018) and Wijsman & Smaal (2006)		
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				

PI 2.6.2	There is a strategy in place for managing translocations such that the fishery does not pose a risk of serious or irreversible harm to the surrounding ecosystem.	
Draft scoring range		>80
Information gap indicator		Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report		
Overall Performance Indicator score		95
Condition number (if relevant)		-

### PI 2.6.3 – Translocation information

PI 2.6.3		Information on the impact of the translocation activity on the environment is adequate to determine the risk posed by the fishery.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guidepost	Information is available on the presence or absence of diseases, pests, pathogens, and non-native species at the source and destination of the translocated stock to guide the management strategy and reduce the risks associated with the translocation.	Information is sufficient to adequately inform the risk and impact assessments required in the SG80 Translocation management level of performance (PI 2.6.2).	Information from frequent and comprehensive monitoring demonstrates no impact from introduced diseases, pests, and non-native species with a high degree of certainty.
	Met?	Yes	Yes	No
	Justification	Information on pests and non-native species comes from the regular risk-based monitoring conducted by GiMaRIS at source sites and in the Oosterschelde; including species inventories in situ (SASI) and monitoring of species arriving in imports (Big Bags). In relation to introduction of pests and non-native species, the team considered that this programme constituted 'frequent and comprehensive monitoring'.  In relation to diseases and pathogens, there is likewise a monitoring programme for shellfish waters and diseases in each EU member state, with EU-mandated requirements for frequency and type of monitoring. The team concluded that this likewise constitutes 'frequent and comprehensive monitoring'.  The information is sufficient to inform the management system, as set out in PI2.6.2. <b>SG60 and SG80 are met.</b> As a 'high degree of certainty' is not defined quantitatively for the translocation component, and considering that the probability of impacts from accidental introduction is difficult to quantify, it is not clear whether the required probability threshold of no impact under the current management system is achieved. <b>SG100 is not met.</b>		
References		See PI 2.6.1 and PI 2.6.2		
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				

<b>&gt;80</b>	
<b>Information sufficient to score PI</b>	
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	-



## 6.6 Principle 3

### 6.6.1 Legal basis and management set-up

The fishery is a single jurisdiction fishery. Since recertification there have been no major changes in the management system. The fishery is subject to EU and national legislation. The basis is the Common Fisheries Policy (CFP), a set of rules for managing European fishing fleets and for conserving fish stocks in order to ensure that fishing is environmentally, economically, and socially sustainable. Since mussels are a non-quota species under the CFP, there is a number of regulations dealing with nature protection, production areas and water quality that do apply, e.g.:

- Habitat Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora)
- Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds)
- Water Framework Directive (EC. 2000. 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)

As discussed in section 6.4.5, areas and species designated under the Birds and Habitats Directive together form the Natura 2000 network.

At national level the fishery management is the responsibility of the Ministry of Agriculture, Nature, and Food Quality (Ministerie van Landbouw, Natuur en Voedselkwaliteit: LNV, formerly the Ministry of Economic Affairs). A number of national legislations regulates the fishery, most notably the Visserijwet 1963, implemented through the Reglement Zee- en Kustvisserij and Structuurnota Zee- en Kustvisserij.

The Fisheries Department (Directie Visserij) of the Ministry of LNV develops and implements the policy for the mussel culture as it is laid down in the policy paper *Naar een zilte oogst, Beleidsbesluit Schelpdiervisserij 2005-2020*. The fisheries department also issues the fisheries licences and the Nature Conservation licences relating to the mussel fishery (SMCs, rope culture, imports).

The framework in which the mussel sector operates is determined mainly by the policy paper *Ruimte voor een zilte oogst*, that defines the main objective to act to develop a healthy shellfish fishery sector, using production methods with respect for nature. Concerning the development of natural values, important objectives are used to develop more characteristic sea bottom biotopes (ecological niches) such as stable mussel banks and sea grass fields. The policy paper also focuses on targets for: broadening the social basis and avoidance of judicial procedures among stakeholders (e.g. a sector against NGOs) conservation of historical–cultural values of the shellfish fishery communication with relevant stakeholders taking into account the social-economic consequences (such as regional employment opportunities).

On behalf of LNV the NVWA (Netherlands Food and Consumer Product Safety Authority) enforces rules and regulations for fishery-specific activities (both on land and at sea). The Ministry of Infrastructure and Environment (Ministerie Infrastructuur en Milieu: I&M) is in charge of shipping (e.g. the implementation of Traffic Separation Schemes), and safety at sea.

The Regional government of Zeeland Province also have policies dedicated to shellfish fisheries, one of which is the import policy discussed in section 6.6.1.1. Following this new agreement (addendum

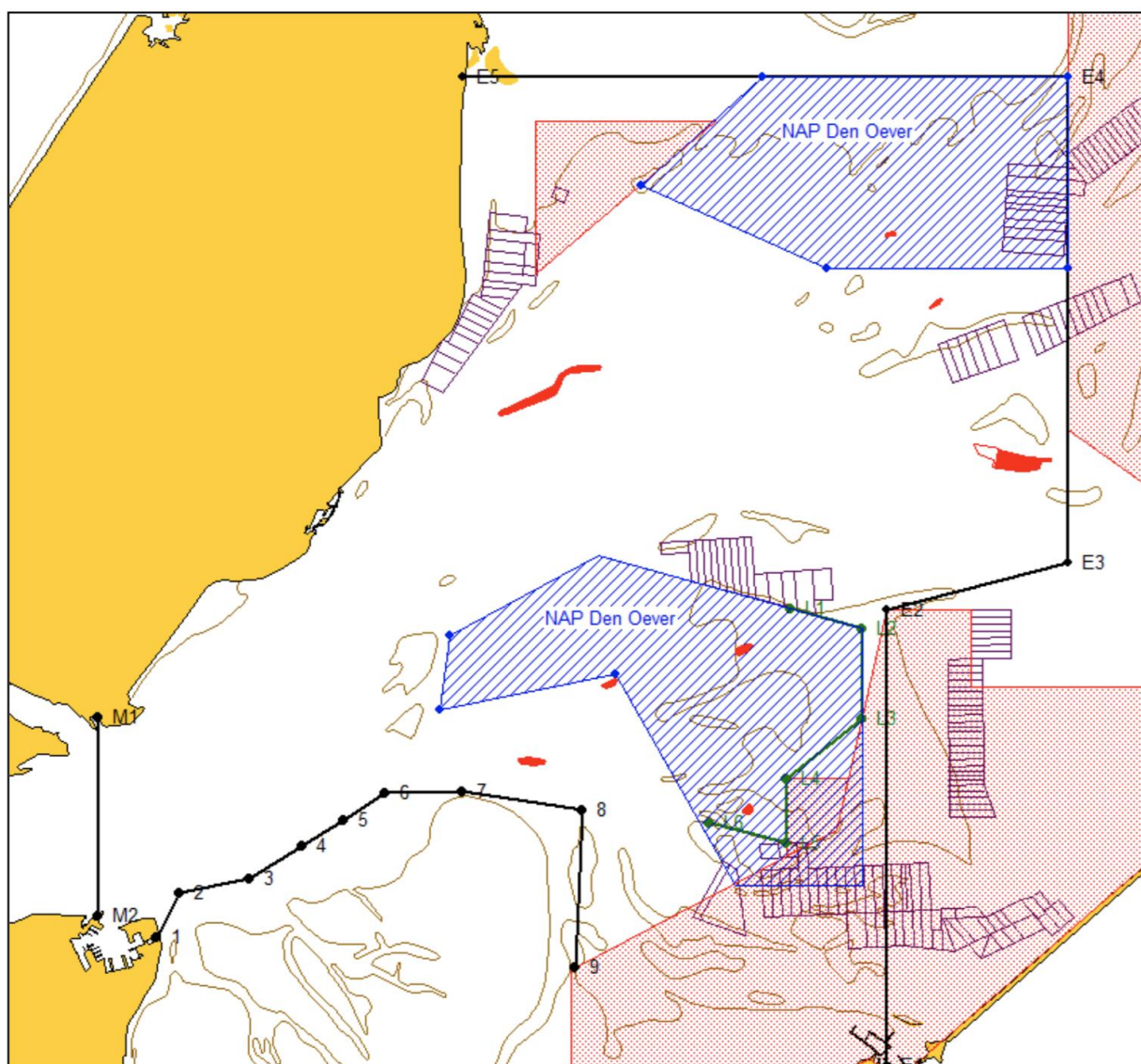
to the original agreement December 2020), new MZI-policy was published (Ministry LNV, 2020b). This will again allow for a new multi-year licence. At the beginning of 2021, preparations were underway for this licence, but the appropriate assessment was not yet available to the assessor.

Mussel translocation-specific legislation. The *Oosterscheldevisie 2018-2024* offers policy scope for rope grown culture and SMCs in the Dutch Delta, whereas the *Economische agenda Provincie Zeeland 2017-2021* aims to support the implementation of innovative experiments and research projects (Provincie Zeeland, 2017).

The only new development since the (re)assessment is the finalisation of the management plans for the Oosterschelde Natura 2000 area as part of the Deltawateren Beheerplan 2016-2022, and the Natura 2000 management plan for the Dutch Wadden Sea 2016-2022. The plans set out *inter alia* the licensing requirements for activities taking place in both areas and removes the need for separate Natura 2000 licences (licences based on the Natura protection act) for some activities, including mussel culture in both the Oosterschelde and the DWS. The suspended growing of mussels, SMCs, fishing for seed mussels, and relocating of mussel plots still require a separate Natura 2000 licence.

As seed fisheries are dependent on the amount and density of seed available, these are licensed on a case-by-case basis. The PO has to draft a fishing plan, based on the inventories done (e.g. van Stralen, 2020 and 2018) including: details of the intended fishing areas (see e.g. Figure 15), the maximum amount of mussel seed fished (fishing quota), and the way in which the catches will be measured (through independent third-party monitoring by employees of the Mussel Auction, observed by officials from the Ministry of LNV).

The details of the fishing areas are made available to the fishermen as digital maps to be used on board with GPS and controlled through the black-box system. The last fishing activities were licensed for autumn 2020 (Ministerie LNV, 2020).



**Figure 15. Map of the seed fishing area autumn 2020 (from the addendum to the Fishing Plan 2020, phase 2). The borders of the fishing area are marked in black. Seed beds are shown in red, mussel plots in purple. The areas shaded red are areas closed in the Mussel Transition Agreement. The areas shaded blue have a tidal regime, with a minimum water depth for fishing.**

Following the Mussel Transition Agreement from 2008 (see section 6.6.2), SMCs were covered a multi-year Natura 2000 licence (2015-2018), which in 2019 was extended for one year by the Ministry van Landbouw, Natuur en Voedselkwaliteit pending discussions on the new Mussel Agreement. Consultations for a new multi-year licence are still ongoing and early 2020 new 1-year licences were obtained, based on the updated appropriate assessment (Agonus, 2019). Following this new agreement (addendum to the original agreement December 2020), new MZI-policy was published (Ministry LNV, 2020b). This will again allow for a new multi-year licence. At the beginning of 2021, preparations were underway for this licence, but the appropriate assessment was not yet available to the assessor.

#### 6.6.1.1 Mussel translocation-specific legislation

At the time of the initial assessment, the regulations affecting translocations of shellfish into the Oosterschelde were set out in the Policy Decisions by the Ministry of Economic Affairs, Agriculture,

and Innovation<sup>3</sup> (2012). This policy document states that translocation of shellfish from areas that are not ecologically similar to the Oosterschelde is prohibited. Ecologically similar areas are found along the UK, Irish and Danish coasts. Translocation is possible with a Nature Conservation licence from the Ministry of LNV, to allow for risk management: each licence is based on an appropriate assessment, in which a risk assessment is included. The risk assessment is derived from SASIs (schelpdier afhankelijke soort inventarisatie: an inventory of species associated with shellfish).

The SASIs are part of a larger system of risk management and are required based on the SIMP (Shellfish Import Monitoring Protocol).

For mussel translocations, several Natura Conservation licenses exist, each tied to specific areas, and each with their own SASI. Each licence is valid for four years, whereas a SASI is valid for three years. No sanctions have been issued or licences withdrawn since the initial assessment.

As indicated in the Public Certification Report (Gascoigne et al, 2016b), there remained issues with regards to the licenses for dumping cultch (empty shell material from harvesting / processing) in the Oosterschelde. It is permitted under certain circumstances to dump mussel cultch. For cultch from 'other areas' (i.e. not the Dutch coastal areas or German Wadden Sea), the dumping of cultch is also subject to licensing, with Zeeland Province as a competent authority. However, as the policy for cultch was tied in with other translocation issues (like the import of oysters from e.g. France), the Province had to develop a comprehensive policy framework. This new policy was agreed on in June 2017 by the County Council of the Province of Zeeland, and came into effect on 1st March 2018.

The Province has aligned their shellfish policy with that of the Ministry of LNV. The Policy Decision from the Province states that in case a license has been obtained for the translocation of mussels through the Ministry, no separate license for the dumping of cultch into the Oosterschelde is needed. The risk management as defined in the SIMP will apply in those cases. To reflect the new policy, the SIMP was updated in February 2018 (Gittenberger, 2018).

The Policy Decision also allows for shellfish (molluscs in a broad sense, and also including crustaceans and echinoderms) to be processed in 'isolation', for example in case a potential invasive species is discovered during a SASI or during the routine big-bag sampling, and the licence for a certain area has to be revoked. Shellfish from 'not ecologically similar areas', where risk management through the SIMP (mainly by ways of a SASI, license, and routine big-bag sampling) is not possible, have to be processed in separate facilities, where water is treated before it can be drained back into the Oosterschelde. Cultch in those cases is kept separate, to be incinerated.

Finally, the policy from the Province requires that the Mussel auction (on behalf of the control authority) is notified of each imported lot for which a SASI is needed and that documentation is provided (like registration documents, transport documents, etc), similarly to the licence requirements by the Ministry of LNV (see also traceability, Section 5 for details of the required documents).

The new policy from the Province of Zeeland adopts a more precautionary, risk-based approach, and allows for more control and regulation of all shellfish translocations (not just mussels).

There have been no changes to the management of the fishery since the implementation of the new policy. The translocation of mussels into the Oosterschelde still follows the same method as at the

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<sup>3</sup> the Ministry of Economic Affairs, Agriculture, and Innovation has been renamed several times since 2012, and is currently known as the Ministry of Agriculture, Nature and Food Quality (LNV).

time of the initial assessment, see PI 2.6.1 for details. So far, there has been no need to either stop imports from a certain area or change the sampling level.

### 6.6.2 Update on the Mussel Transition Agreement

In 2008, an agreement was signed between the Dutch Ministry of Agriculture, Nature & Food Quality (LNV), the mussel sector and major NGOs entitled '*Convenant Transitie mosselsector en natuurherstel in de Waddenzee*', in this report referred to as the Mussel Transition Agreement. The basis of the agreement is to maintain mussel culture by a phased replacement of the wild mussel seed fishery with alternative seed production techniques such as SMCs, and in doing so, protect natural mussel beds by closing areas to the wild seed fishery. Although this agreement was in place at the time of the initial assessments, it had yet to be implemented.

Implementation commenced in 2009/2010, as outlined in the associated Implementation Plan (Ministerie LNV, 2009), *Plan van Uitvoering* (PvU) and Figure 16. The PvU was evaluated in 2013 and although progress was thought to be behind the targets outlined in 2008, the transition is considered to be successful with an observed increase in the amount of seed harvested with SMCs and two transition steps realised, in 2009 and 2013 (Ministerie LNV, 2014).

The increase in the use of SMCs is shown in Figure 17. Annual surveys evaluate the area and production of the SMCs as well as various other aspects of the fishery (summarised under Principle 2).

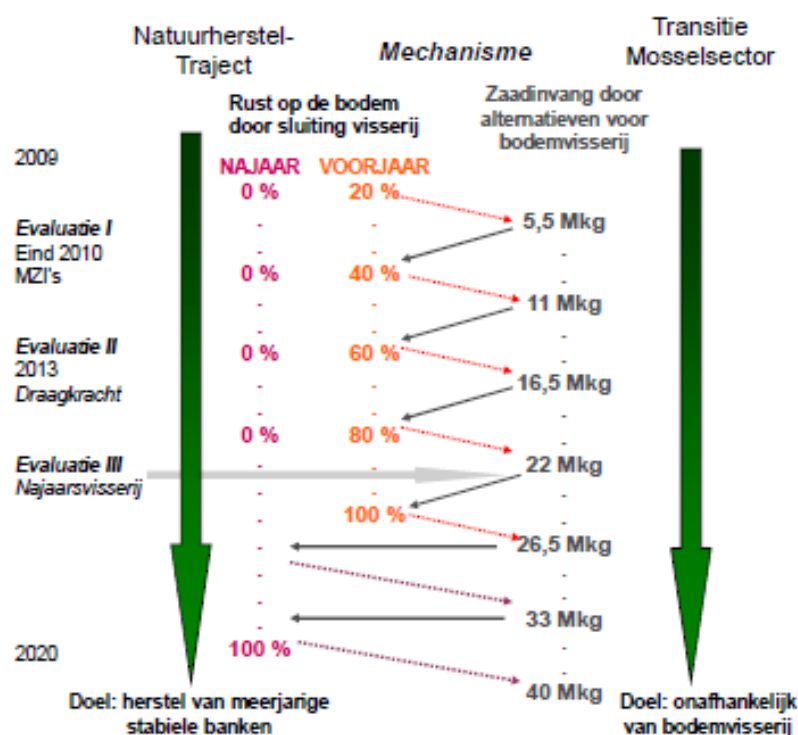
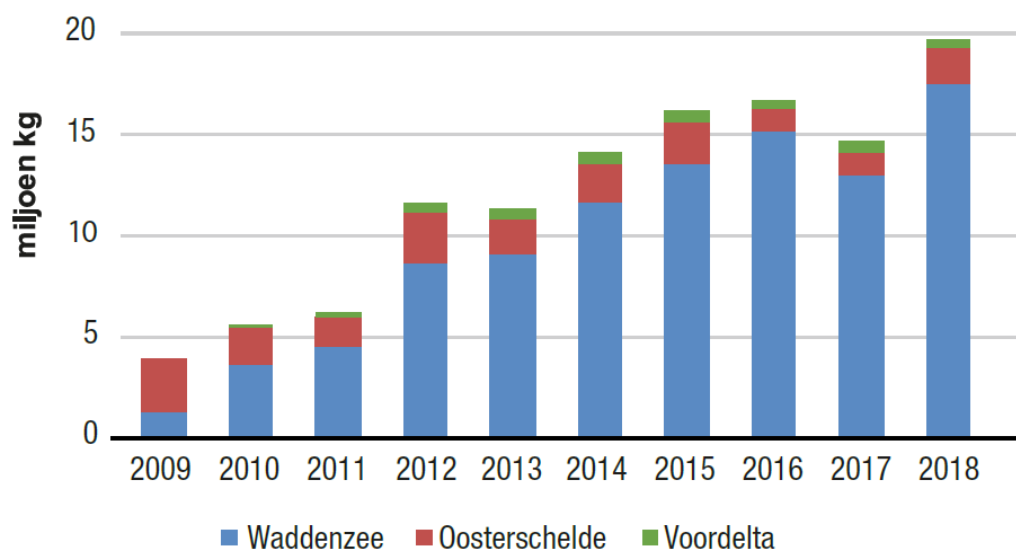


Figure 16. Schematic of the implementation of the transition agreement (Source: Ministerie LNV, 2009). The green arrow on the left is the trajectory of the ecosystem recovery (end goal: recovery of multi-year stable mussel beds) and on the right the trajectory of the transition (end goal: mussel fishery independent from wild seed fishery). In purple is the proposed proportional closures of the autumn seed fishery ('najaar') and in orange the spring seed fishery ('voorjaar') – the spring fishery is prioritised for reasons which are explained under P2. The figures on the right are the target levels of seed production from SMCs to be reached to compensate for each tranche of closure (in million kgs).





**Figure 17. Increase in the use of SMCs (in million kgs) (figure 4 in PRW, 2019)**

The initial aim was that the full transition would be achieved by 2020; however, there is an acknowledgement that the transition has to be based on trial and error, with step-wise implementation and monitoring of results and that this target may therefore be adjusted on the basis of research results, evaluation and experience (Rijkswaterstaat 2016e). The transition was initiated in 2009, with an annual closure of 20% of spring mussel beds to the seed fishery. An evaluation of the agreement in 2013 revealed that the 2020 target was not achievable; the stepwise increase in spring mussel bed closures therefore continues. The schematic progress of the transition can be found in Figure 9, and is discussed in the Principle 2 scoring tables as well (see PI 2.3.1). Acknowledging that the initial 2020 target would not be reached, a new agreement was reached in December 2020 between the *Coalitie Wadden Natuurlijk*, the *PO Mosselcultuur* and the *Ministerie van Landbouw, Natuur en Voedselkwaliteit (LNV)*: from Spring 2021, 36% of the Dutch Wadden Sea will already have been closed to the bottom seed fishery. This will be gradually increased to 50% in 2022 and 65% in 2026. The intent is to achieve a 100% closure by 2029, but only if this is economically viable for the mussel sector. In parallel, another 760 ha (of which 500 ha in the Wadden Sea) will be made available to SMC seed production (with some flexibility in locations to ensure quality can be maintained) with subsidies also provided.

As mentioned under Principle 2, as an additional measure to ensure food availability for ETP birds, there is a requirement to leave a minimum amount of mussels on the subtidal culture plots during the winter period. Previously this was realised through the rule that 85% of the mussel spat fished during the spring fishery (or the biomass equivalent) needs to remain on the mussel plots in the Wadden Sea for up to 1 year and thus cannot be moved to the Oosterschelde during winter. Though this was easily achieved, as mussel seed fished generally remains on the culture plots in the Wadden Sea for around 2 years, before being moved to the Oosterschelde for the winter and subsequent sales come summer, a more refined system was devised to ensure that the combination of fishing, cultivation and the eventual removal of mussels does not lead to fewer mussels in the Wadden Sea. This concept is applied through a calculation model which can be used to determine the minimum number of mussels

that should be placed on the culture plots in autumn and which should remain available as a food source for birds. The implementation of this VKA-scheme (VKA: the controlled removal of mussels from Wadden Sea to Oosterschelde;; Vissen, Kweken, Afvoer in Dutch or Fishing, Culture and Removal) is part of the N2000-licence for the fishery, and shows that a surplus of mussels are left in the Wadden Sea each winter, which can serve as a food source for the eider ducks overwintering in the area (see Figure 11). The model is described in more detail under PI 2.3.1c.

All of the intertidal is also closed to the mussel fishery.

Tied in with the closures of fishing areas was the optimisation of the culture plots. This is a drawn-out process with the aim to substitute culture plots that have decreased in quality (e.g. due to sedimentation or changed flow patterns) with new culture plots. The new culture plots will have to be assessed against the Natura 2000 qualifying features. The realisation of the new plots is the final step in the 3<sup>rd</sup> transition phase of the mussel transition agreement (see section 1.4 for a summary of the agreement and section 6.6.2 for the full update). The Nature licence has been applied for, and the expectation is that the licence will be granted in 2021. Following this, the addendum to the mussel transition agreement, as realised in December 2020, will come into effect.

### 6.6.3 Consultation, roles and responsibilities

Organisations involved in the management system for mussel fisheries (including rope culture) and mussel imports and their roles and responsibilities are set out in Table 17.

**Table 17. Organisations involved in management of mussel fisheries and - imports, their roles and responsibilities**

Organisation	Roles and responsibilities
Ministry of Agriculture, Nature & Food Quality (LNV)	Ministry responsible for environmental matters in the Netherlands. Responsible for policy on mussel imports, and for approving / rejecting and issuing Nature Conservation licenses. Also responsible for enforcement but this activity is delegated to the NVWA
Dutch Food and Consumer Product Safety Authority (NVWA)	Responsible for monitoring for food safety. Enforcement responsibilities for mussel imports have also been delegated to this body by the Ministry of Economic Affairs.
Regional government of Zeeland Province	Responsible for licensing for cultch disposal, in authorised areas of the Oosterschelde
Producenten Organisatie van de Nederlandse Mosselcultuur UA	Dutch PO mussel culture, representing Dutch mussel farmers (under UoA 1, 2 and 4). Prepare licence applications and commission appropriate assessments on behalf of members, commission research into mussel farming. Represent members in discussions relating to policy. Organise communication and marketing of Dutch mussels.
Vereniging Zeeuwse Hangcultuurkwekers (VZHK)	Rope Growers' Association, representing Dutch mussel rope growers (under UoA 3). Represent members in discussions relating to policy, organise communication and marketing of Dutch rope grown mussels.

Vereniging van Importeurs van Schelpdieren	Shellfish Importers Association. Prepare licence applications and appropriate assessments on behalf of members
Dutch Mussel Auction	The only auction dedicated to mussels only. Takes care of administrative tasks relating to import licences (registration of imports and required documentation)
GiMaRIS	Consultancy who is contracted to develop monitoring protocols and carry out monitoring (SASIs and Big Bag)
Wageningen Marine Research (WMR)	Research institute, carrying out monitoring tasks as commissioned by the government (e.g. shellfish inventories) and by the industry (e.g. PRODUS, KOMPRO, see section 6.4.1)

The organisations involved in mussel fishery management in the Netherlands, and their roles and responsibilities have not changed much since the initial assessments, except that the Productschap Vis (PVis) has been abolished in 2012.

There are structured consultation processes, especially those which apply to the Nature Conservation licensing process. Each licence application is subject to a comment period, and registered stakeholders are sent a copy of the application and the appropriate assessment. Consultation of stakeholders also takes in relation to the Natura 2000-managements plans, or when new policy is being developed.

Under Article 1:2 of the Algemene wet bestuursrecht (General Administrative Law), a 'stakeholder' is defined as an organisation (or individual) 'whose interest is directly affected by an order'. An organisation's 'interests' are deemed to include *'the general and collective interests, which they particularly represent in accordance with their objects and as evidenced by their actual activities'*. This includes environmental NGOs; however, because of a history of court cases being brought against activities in Natura 2000 areas in the Netherlands, some of which might be described as vexatious, the common law definition of how a stakeholder demonstrates an interest in a given subject or area is quite tight – an organisation that exists for the sole purpose of taking legal action, for example, would not be considered a 'stakeholder' in this process.

#### **6.6.4 Monitoring, control and surveillance**

As stated above, the Ministry of LNV have delegated the monitoring and enforcement in this fishery to the Dutch Food and Consumer Product Safety Authority (who also carry out hygiene testing and have an office in Yerseke), though the Ministry of LNV also operates inspection vessels in the Waddenzee and the Oosterschelde. The fishery inspectors onboard these vessels have policing powers and control fishing activities in these waters.

All Dutch mussel growers in UoA 1 - 4 are members of the Producenten Organisatie van de Nederlandse Mosselcultuur UA (PO). To obtain mussel seed for grow-out Vereniging Zeeuwse Hangcultuurkwekers (VZHK)- members are also member of the PO.

Over the years the PO has developed and implemented an extensive management system based on self-regulation and co-management principles. The Dutch government has delegated the



responsibilities for the allocation of quota and the management of mussel seed fishery to the PO. The PO Mossel sets the total allowable catch for the seed fishery and allocates individual quota to its members through the Fishing Plan, as discussed in section 6.6.1.

The black box system is still a key factor in ensuring compliance in this fishery, especially with regards to actual fishing practices (UoA 2 and 4). As rope grown culture plots (included in UoA3) and SMCs (UoA 1) are fixed in place, with coordinates recorded in the Nature licences, this is easily monitored.

The black box continuously registers the position and speed of all mussel fishing boats. The records of the black box are regularly checked and inspected by a commission of two persons, who check the legality of all the movements and activities of the mussel fishing boats. In case of a violation of a rule the procedure as described in the *Reglement afdoening overtredingen* (Rules for handling violations) is applied. The conduct of the fisherman involved will be evaluated by an independent commission that can impose a fine. Appeal against a ruling of the independent commission is possible at the Dutch arbitration association based in Rotterdam (Nederlands Arbitrage Instituut).

Levels of compliance and evaluations suggest that the self-regulation system applied by the PO is generally highly effective. During the last three surveillance audits (see Sieben 2018 and 2019; Seip, 2020), no serious violations were reported. The PO is also in close contact with the fishery inspectors and as such is able to warn members before infringements occur.

In relation to the monitoring of imports (UoA 5), the mussel companies are required to complete customs declarations for each shipment, as described in section 5. During the last four surveillance audits (see Sieben et al, 2017, 2018 and 2019; Seip et al, 2020), no serious infringements were reported.

## 6.7 Principle 3 Performance Indicator scores and rationales

### 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"> <li>- Is capable of delivering sustainability in the UoA(s);</li> <li>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>- Incorporates an appropriate dispute resolution framework</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system <b>and a framework for cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and <b>organised and effective cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and <b>binding procedures governing cooperation with other parties</b> which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Yes	Yes	Yes
Rationale				
<b>UoA 1-4 (bottom dredge, SMCs, rope culture and bottom culture)</b> - Generally, fisheries in the EU are managed through the CFP. The CFP “should ensure that fishing and aquaculture activities contribute to long-term environmental, economic, and social sustainability.” It states also that “access to a fishery should be based on transparent and objective criteria including those of an environmental, social and economic nature. Member States should promote responsible fishing by providing incentives to those operators who fish in the least environmentally damaging way and who provide the greatest benefits for society.” (Basic fisheries regulation 2371/2002 and amended acts 865/2007, 1224/2009, 1152/2012 and 1380/2013).				

Since mussels are a non-quota species under the CFP, there is a number of regulations dealing with nature protection, production areas and water quality that do apply, e.g.:

- Habitat Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora)
- Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds)
- Water Framework Directive (EC. 2000. 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)

The Netherlands have also ratified the United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS, 1982) which set out the principle that all States have a duty to adopt appropriate measures to ensure sustainable management of marine resources and to cooperate with each other to this end. The management system follows the principles set out in the FAO Code of Conduct for Responsible Fisheries (FAO, 1995a), which includes the application of a precautionary approach. It also complies with the requirements in the UN Fish Stocks Agreement (FAO 1995b) regarding reference points and application of the precautionary approach as well as the Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas (FAO, 1993). And finally, the Netherlands have signed the UN Convention on Biological Diversity (UN, 1992).

As this fishery takes place within Dutch territorial waters, Dutch legislation has to be applied. The Visserijwet (1963 – Fisheries Law) and accompanying legislation (e.g. Reglement zee- en kustvisserij - Sea and Coastal Fisheries Regulations) provides the larger legal framework, and contain stipulations that nature conservation could be a determining factor in setting Ministerial rules (see e.g. art.4.1 of the Fishery Law). This includes protection measures (e.g. closed seasons, closed zones), licensing procedures, control and enforcement regulations etc.

The Natura 2000-framework, formed by the Birds- and Habitats Directive, requires the fisheries to not affect nature conservation targets for the habitats and species concerned. This is guaranteed by the Natura 2000 management plans (also discussed under Principle 2, specifically PI 2.5.2) and where needed, the activity-specific Nature Conservation Licences (e.g. the Nature Licence for the seed fishery (Ministry LNV, 2020a and 2020b), and the SMCs (Ministry LNV, 2020c).

Also, The Agreement “Transition of the Mussel Fishery and Rehabilitation of the Ecosystem Wadden Sea” (renewed in December 2020) sets objectives to increase the sustainability of the mussel fishery and culture, and for SMCs following the Agreement, new policy for SMCs has been published, detailing current and future policy for establishing the additional 760 ha that will be made available to SMC seed production (with some flexibility in locations to ensure quality can be maintained) and on the subsidies also provided.

The legal framework ensures that management outcomes are consistent with MSC Principles 1 and 2, and cooperation with other parties takes place to ensure this (e.g. in the Visserijinitiatief Zeeland: VIZ, through the Mussel Transition Agreement and Programma Rijke Waddenzee -Program for a rich Wadden Sea). **SG60, SG80 and SG100 are met.**

**UoA 5 translocation** - The legal basis for the regulation of mussel imports is the EU Natura 2000 framework, as translated into Dutch law via the Nature Conservation Act (2017, previously a separate law from 1998). Each translocation activity requires a Nature Conservation licence from the Ministry of LNV. This is because the Oosterschelde

is a Natura 2000 site designated as both a Special Area for Conservation (SAC) under the EC Habitats Directive and a Special Protection Area (SPA) under the EC Birds Directive. As a part of the licence application process, an Appropriate Assessment (AA) has to be carried out which consists of a risk assessment derived from the SIMP (SASIs and BBs) for each source area (see also PI 2.6.1). Each licence is valid for four years.

Other jurisdictions are involved tangentially – for example the EU legal framework for monitoring shellfish waters and diseases (described under PI 2.6.1 above) is implemented in each source jurisdiction. In this case, there is an EU-wide framework for reporting which ensures that shellfish from contaminated areas cannot be exported illegally. These requirements are binding. The translocation policy as outlined by the Province Zeeland in 2017 (see section Following this new agreement (addendum to the original agreement December 2020), new MZI-policy was published (Ministry LNV, 2020b). This will again allow for a new multi-year licence. At the beginning of 2021, preparations were underway for this licence, but the appropriate assessment was not yet available to the assessor.

Mussel translocation-specific legislation) provides additional rules for translocation of shellfish, and adds to the risk-based approach for translocations. The legal framework has ensured good outcomes so far in relation to translocations (see under Principles 1 and 2): since the initial assessment, none of the species identified in the SASIs and BBs have been considered to be problematic for the Oosterschelde (Gittenberger et al, 2020, 2019a-d, 2018, 2017 a-f). As for UoA 1-4, cooperation with other parties takes place to ensure this (regular discussions on the licencing requirements take place with e.g. the Ministry of LNV, and GiMaRIS, stakeholders are kept informed of new developments through e.g. the Visserijinitiatief Zeeland: VIZ) **SG60, SG80 and 100 are met.**

b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a <b>mechanism</b> for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution of legal disputes which is <b>considered to be effective</b> 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 <b>transparent mechanism</b> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <b>tested and proven to be effective</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
There are well-established and transparent mechanisms in place for resolving legal disputes at national and, if need be, at EU level, ensuring that management measures can be enforced in EC and (in this case only) national waters. 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. Similarly, stakeholders can object to licences and if their objection is not (fully) taken into account, can take their				

case to court as well. Verdicts at the lower court levels can be appealed to higher levels. There are instances that management authorities have lost cases against either NGOs or fishermen and accepted the verdict (e.g. the court case in 2008 from the NGOs against the mussel fishery licence in the Wadden Sea.

(<https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RVS:2008:BC5266>), which ultimately lead to the Mussel Agreement), which is a clear demonstration that the system works. Most issues are, however, resolved before they reach the court system, e.g. in discussions between authorities and actors in the fishing industry.

#### UoA 1-4

Conflicts within the PO are resolved through on-demand meetings as stipulated by the internal regulation, with the option to appeal against a ruling of the independent at the Dutch arbitration association, or even take the board of the PO to court. This most recently happened in Spring 2020, where a member of the PO formally objected to the optimisation of the mussel plots, and after the internal arbitration procedure took his case to court. The lawsuit judged the PO to be within its rights (personal communication Addy Risseeuw, PO).

In the Transition Agreement and implementation plan (2008) signed between the Ministry, the PO and some nature conservation NGOs particular importance is attached to the good cooperation between the undersigned. The addendum to the Agreement (December 2020), continuing the Agreement under new conditions, also contains wording on how to deal with further delays in closures, including the appointing of a 3-person committee to advise on further steps and the ultimate step taking the Agreement partners to court.

There is a transparent mechanism in place and the system has been tested and appears to be effective. **SG60, SG80 and 100 are met.**

#### UoA 5

Similarly as for UoA 1-4, there is also an administrative process of appeal (either by the mussel companies or by other stakeholders), after which a licensing decision will be reviewed. The mechanism is transparent – for example, judgments of court cases are available online. The translocation licences have not been subject to court cases since 2011. There is a transparent mechanism in place and the system has been tested and appears to be effective. **SG60, SG80 and SG100 are met.**

c	Respect for rights		
	Guide post	The management system has a mechanism to <b>generally respect</b> 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 <b>observe</b> 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 <b>formally commit</b> 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?	Yes	Yes	Yes
Rationale				
<p>The Dutch fisheries legislation (Visserijwet, 1963) implements European laws. The CFP states that “In view of the precarious economic state of the fishing industry and the dependence of certain coastal communities on fishing, it is necessary to ensure the relative stability of fishing activities by allocating fishing opportunities among Member States, based on a predictable share of the stocks for each Member State” (EC, 2013).</p> <p>The plots used by the mussel companies in the Wadden Sea and Oosterschelde are leased from the Ministry of LNV and are not open to fishing by others without permission from both the licence holder and the Ministry. Nevertheless, there is no shortage of mussels elsewhere in the Dutch Delta, Wadden Sea and surrounding areas which may be taken for personal consumption, at the individual's own risk (10kgs per person per day).</p> <p>Seed fishery, seed collectors, rope culture plots and mussel imports are all subject to licenses, with the existing culture plots being incorporated in the Natura 2000 management plans. The new plots under the optimisation project will be subject to licensing as well, and the rights of other fisheries are taken into account whenever decisions are taken as part of the licensing procedure. This has been made explicit in e.g. the new SMC policy (2021-2026), and the viewpoints of other fisheries in the area (mainly the brown shrimp fisheries in the Wadden Sea and Voordelta) are included in the policy document.</p> <p>Based on the above, the management system has a mechanism to formally commit to the legal rights. <b>SG60, SG80 and SG100 are met.</b></p>				
References				
<p>EC, 1992; EC, 2000; EC, 2002; EC, 2007; EC, 2008, EC, 2009a; EV, 2009b ; EC, 2012; EC, 2013; EC, 2014a ; FAO, 1993; FAO, 1995a, FAO, 1995b; LNV, 2008; Rijkswaterstaat 2015, 2016a-d; UN, 1982; UN, 1992 ; PO 2006 a and b ; Vereniging Zeeuwse Hangcultuurkwekers, 2015; Fisheries Law 1963 (Visserijwet 1963): <a href="http://wetten.overheid.nl/BWBR0002416/2015-01-01">http://wetten.overheid.nl/BWBR0002416/2015-01-01</a>; General Administrative Law Act (Algemene Wet bestuursrecht): <a href="http://wetten.overheid.nl/BWBR0005537/2017-09-01">http://wetten.overheid.nl/BWBR0005537/2017-09-01</a></p> <p>Program for a Rich Wadden Sea: <a href="https://rijkwaddenzee.nl/en/project/implementation-of-fishing-covenants-and-agreements/">https://rijkwaddenzee.nl/en/project/implementation-of-fishing-covenants-and-agreements/</a></p>				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range			>80	

Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	-

### PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties		
		The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>generally understood</b> .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for key areas</b> of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for all areas</b> of responsibility and interaction.
	Met?	Yes	Yes	Yes
Rationale				
<p>The management system for the fishery involves scientists, government (both at a national and regional level), fisheries managers and stakeholders in a consultative process. Function and roles of all parties in all areas of responsibility are defined and well understood, see also Table 17 in section 6.6.3. On a local level the Visserij Initiatief Zeeland (VIZ) is main body to discuss all issues on fisheries in Zeeland and involves all stakeholders (industry, scientists, NGOs, civil servants). The VIZ is mainly a stakeholder forum, but they advise 'Gedeputeerde Staten' the Provincial Executive of the Province Zeeland'. Likewise, the Programma naar een Rijke Waddenzee (PRW), Program for a Rich Wadden Sea, through which the Mussel Agreement is facilitated, serves as a local stakeholder forum for the Wadden Sea.</p> <p>During the assessment of the mussel translocation fishery (UoA 5), the uncertainty surrounding licences for the disposal of cultch (a regional competency) meant that SG100 could not be met. Since the initial assessment the situation has changed, and with the new policy from the Province of Zeeland, the uncertainty has been lifted.</p> <p>Functions, roles and responsibilities for the organisations and individuals involved in the management process are explicitly defined and well understood for all areas of responsibility and interaction for all UoAs. <b>SG60, SG80 and 100 are met for all UoAs.</b></p>				
b	Consultation processes			



	Guide post	The management system includes consultation processes that <b>obtain relevant information</b> from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information and <b>explains how it is used or not used</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>Consultations processes are set out in Section 6.6.3. There is a formalised consultation process for licensing, with an appeal-process for both applicants and stakeholders. There exists a consultation process engaging fisheries and environmental NGOs, PO and other stakeholders. The management system has been continually adapted (strengthened), partly as a response to input from stakeholders (e.g. eNGOs and research institutes in the case of mussel translocations, and the new SMC-policy). Relevant information is regularly collected (both personally by Fisheries Managers and through the Blackbox system), including local knowledge. A lot of the research is area-specific and in cooperation with fishers.</p> <p>There are regular consultation meetings to facilitate the exchange between the institutions. The Fisheries Administration takes the decision on the basis of scientific advice and national legislation. An arrangement between the PO and WMR guarantees the exchange of knowledge between the researchers and farmers. This agreement consists of an agreed annual 'buy-in' from the PO into a research program from WMR. The PO is part of the steering group that defines the research program that is carried out by WMR every year. The agreement also allows for some 'ad-hoc' research to be done when urgent questions arise. <b>SG60 and SG80 are met</b>. Explanations on whether and how information have been used to reach a decision are not always disseminated. Hence <b>SG100 is not met</b>.</p>				
c	Participation			
	Guide post		The consultation process <b>provides opportunity</b> for all interested and affected parties to be involved.	The consultation process provides <b>opportunity and encouragement</b> for all interested and affected parties to be involved, and <b>facilitates</b> their effective engagement.
	Met?		<b>Yes</b>	<b>Yes</b>
Rationale				

There exists a regular exchange between the Fisheries Administration and the PO, VZHK and Import Association. Members of the PO (including the VZKH-members) are informed of new developments through regular meetings and a weekly internal newsletter, as are the members of the Import Association. Opportunities exist for all interested parties to be involved in the process. Stakeholders are invited to e.g. meetings about area-specific Natura 2000 management plans and facilitated where needed. The regular meetings held by the VIZ provides opportunities for each stakeholder to participate in the process regarding the Dutch Delta, and the Mussel Agreement discussions focus on the Wadden Sea. In the case of other management decisions (e.g. with regards to Natura 2000, or Water Framework Directive), participation is encouraged and facilitated as lined out in the Dutch General Administrative Law Act. Documents are made available through a separate website ([www.platformparticipatie.nl](http://www.platformparticipatie.nl)). Participation is encouraged and facilitated. **SG80 and SG100 are met.**

#### References

LVN, 2008; LVN, 2009; Rijkswaterstaat 2015, 2016a-d; PO 2006 a and b ; Vereniging Zeeuwse Hangcultuurkwekers, 2015; Fisheries Law 1963 (Visserijwet 1963): <http://wetten.overheid.nl/BWBR0002416/2015-01-01>; General Administrative Law Act (Algemene Wet bestuursrecht): <http://wetten.overheid.nl/BWBR0005537/2017-09-01>; [www.platformparticipatie.nl](http://www.platformparticipatie.nl) ; reference to VIZ in documents of Gedupeerde Staten Zeeland, e.g.: <https://www.zeeland.nl/digitaalarchief/zeel0800380> (p.2) Program for a Rich Wadden Sea: <https://rijkwaddenzee.nl/en/project/implementation-of-fishing-covenants-and-agreements/>

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	>80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	95
Condition number (if relevant)	-

### 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			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are <b>implicit</b> within management policy.	<b>Clear</b> long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are <b>explicit</b> within management policy.	<b>Clear</b> long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are <b>explicit</b> within <b>and required by</b> management policy.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
<p>The EU CFP as well as the EU Birds- and Habitat directives clearly provide for long term objectives, and that applies also for the Dutch legislation, particularly for:</p> <p>(i) The Policy Decision for the shellfish fishery (2004) where one of the main objectives is “Sustainability of economic activities is required to create employment and income in combination with an improvement of the natural quality of the ecosystems (planet, people, profit);</p> <p>(ii) The Transition Agreement and its implementation plan where several measures for the transition of the mussel sector (e.g. the reduction of mussel seed catches by dredge) and the restoration of the nature have been agreed by the Ministry, the PO and several Nature Conservation Organisations;</p> <p>(iii) the shellfish translocation policies, both from the Ministry of LNV (2012) and the Province of Zeeland (2017), aimed to avoid significant detrimental effects on the Natura 2000 area Oosterschelde through mussel translocation;</p> <p>(iv) The Natura 2000 Management Plans for Wadden Sea, Voordelta, Grevelingen and Oosterschelde, which define what measures have to be taken in order to protect the special environmental characteristics of the particular area and to achieve the objectives of the Habitat Directive.</p> <p>The CFP is explicit on the application of a precautionary approach. The Netherlands have transposed this in the national fisheries legislation (Visserijwet 1963). The precautionary principle is also used in the implementation of the Water Framework Directive through the management- and monitoring plans (see Ministerie van Infrastructuur en Milieu, 2015). <b>SG60, SG80 and SG 100 are met.</b></p>				
References				
Ministerie van Infrastructuur en Milieu, 2015; Rijkswaterstaat 2015, 2016a-d; Ministry of LNV, 2012; Province of Zeeland, 2017				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	100
Condition number (if relevant)	-

### 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			
	Guide post	<b>Objectives</b> , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>implicit</b> within the fishery-specific management system.	<b>Short and long-term objectives</b> , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>explicit</b> within the fishery-specific management system.	<b>Well defined and measurable short and long-term objectives</b> , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>explicit</b> within the fishery-specific management system.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Partial</b>
Rationale				
<p>Well-defined and measurable short- and long-term objectives are explicit within the fishery's management systems (EU and on a national level). <b>SG60 and SG80 are met.</b> Short and long-term objectives consistent with achieving the outcomes of MSC Principles 1 and 2 are explicit in the CFP itself, like the long-term objective to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield (MSY). However, mussels are a non-quota species under the CFP, and shellfish specific regulations are of more importance.</p> <p>With regards to the mussel fishery specifically, after two extensive evaluations of the shellfish Policy paper from 1993 (EVA-I in 1993, EVA-II in 2002), the new Policy Decision for the Shellfish Fishing (2004) has been formulated covering the period from 2005 to 2020. This document and the Natura 2000 Management Plans for Wadden Sea, Voordelta, Oosterschelde and Grevelingen are the basis for the government's policy on shellfish fishery and culture in these areas and are themselves based on the standards set by the EU Habitat (EC, 1992), Birds (EC, 2009a), and Shellfish (EC, 2006) Directives (now incorporated in the Water Framework Directive, EC. 2000. Directive 2000/60/EC). They contain measurable short- and long-term objectives consistent with achieving the outcomes expressed by Principles 1 and 2. In particular, the designation of the Wadden Sea, Voordelta, Oosterschelde and Grevelingen as Natura 2000-areas (under the Birds and Habitats Directives) set out measurable objectives with regards to the quality of the habitat, and protected species (like birds, and marine mammals). In drafting the management plans, the quality status of the objectives has been quantified as much as possible, and the effects of e.g. mussel farming on these objectives has been assessed.</p>				

The Natura 2000 objectives also factor into the Mussel Agreement and the Nature Conservation Licences, and provide a frame of reference for the new SMC policy 2021-2016 (Ministry LNV, 2020d), with the Mussel Agreement (renewed in December 2020) as the agreed upon basis for new policies and objectives relating to the mussel seed fishery, and the use of SMCs.

The status of the Natura 2000- objectives is evaluated every 6 years (through monitoring) and used in drafting new management plans. It is not yet possible however to determine whether the objectives are **demonstrably** consistent with achieving the outcomes expressed by Principles 1 and 2. Hence **SG100 is only partially met**.

#### References

EC, 1992; EC, 2009; EC, 2006; EC, 2000; LNV, 2004; LNV, 2008; LNV, 2020d; Rijkswaterstaat 2015, 2016a-d

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	>80
Information gap indicator	Information sufficient to score PI

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	90
Condition number (if relevant)	-

### 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			
	Guide post	There are <b>some</b> decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are <b>established</b> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	<b>Yes</b>	<b>Yes</b>	
Rationale				
<p>The decision-making process is well established. The PO represents all mussel farmers operating in the Dutch Delta and Wadden Sea (including the rope growers from the VZHK). The PO elaborates the annual fishing plan (visplan) and presents it to the Government. The PO also organises several internal meetings per year where all issues are discussed; this includes also the annual review of the fishing plan.</p> <p>Visserij Initiatief Zeeland (VIZ) is a platform to discuss all fishery matters in Zeeland and involves all stakeholders (industry, scientists, NGOs, civil servants). The VIZ applies a bottom-up approach, with the agenda of the meetings set by the participants. Similarly, the Mussel Transition Agreement provides the basis for regular consultation with the NGOs in the Wadden Sea.</p> <p>Based on scientific advice and in close exchange with the PO, VZHK and VIZ (including a representative from the Shellfish Import Association) decisions are taken by the competent authority (Province, or Ministry). All measures and strategies clearly aim at achieving the long-term objectives fixed in the European and national legislation. <b>SG60 and SG80 are met.</b></p>				
b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to <b>serious issues</b> identified in relevant research, monitoring, evaluation and consultation, in a	Decision-making processes respond to <b>serious and other important issues</b> identified in relevant research, monitoring, evaluation and consultation,	Decision-making processes respond to <b>all issues</b> identified in relevant research, monitoring, evaluation and consultation,

		transparent, timely and adaptive manner and take some account of the wider implications of decisions.	in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>The decision-making process can react in a timely manner on serious and other important issues. The relevant legislations (Agreement for the transition of the mussel sector and its implementation plan, Policy Decision on Mussel Fishery, Natura 2000 management plans) provide for long-term measures restricting the fishery (closed season, closed areas, size of culture plots, number of culture plots, locations of SMCs etc.). The research-cooperation between the PO and WMR (see projects listed in section 6.4.1) stands for target-oriented research, with a current focus on increased rentability. Research is also done on ad hoc basis (e.g. in case of sudden high mortality). The monitoring of the fishery is mainly done via a Black-box system. The PO and LNV have access to the data and closely monitor the fishermen's activities.</p> <p>The mussel translocations are likewise monitored, in accordance with the SIMP (see section 6.4.2), and the status of a licence is dependent on the outcome of the SASIs and Big Bag monitoring (if potentially invasive species – problem species – are found, the licence is either revoked, or not given).</p> <p>There however no evidence that the decision-making process responds <b>to all</b> issues identified. <b>SG60 and SG80 are met, SG100 is not met.</b></p>				
c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		<b>Yes</b>	
Rationale				
<p>Both, the CFP and Code of Conduct stipulate the application of a precautionary approach. The Netherlands have transposed this in the national fisheries legislation (Fisheries Law). The decision-making process is based on the best information available supplied by the Blackbox system, by regular monitoring and research (like the stock assessments carried out by WMR), and during licence procedures. Decision-making (whether it is on licensing of mussel imports, SMCs, bottom culture or rope grown culture) is based on a risk-based monitoring protocol and appropriate assessments. The team considered that this constituted a precautionary approach and use</p>				



of the best available information. There are measures in place aimed at reducing the pressure on the stock and the environment (e.g. the Mussel Transition agreement). <b>SG80 is met.</b>				
d	Accountability and transparency of management system and decision-making process			
	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	<b>Information on the fishery's performance and management action is available on request</b> , 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 <b>provides comprehensive information on the fishery's performance and management actions</b> and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>Information on fishery performance and management action is made available on the Government's website (Informatiebulletin Regelgeving Visserij) and the organisations' websites, and explanations are provided for any actions or lack of action. The Authorities base their decisions on latest scientific advice and any other information available and maintain an exchange with the PO, NGOs and other stakeholders. Stakeholders are proactively informed of licence applications and appropriate assessments, as well as the outcome of the licence decision, as part of the consultation process. In relation to the monitoring of imports, the mussel companies are required to complete customs declarations for each shipment. They are not required to report imports directly to the Food and Consumer Product Safety Authority, but they must keep records, which can then be audited by the enforcement body at any time – i.e. they are available on request to the relevant authorities, and from there to other stakeholders. Licences and other legal decisions (e.g. ref court case summary) explain why actions were taken or not taken: both the licenses and court reports contain explanatory notes justifying the decision making (see for Nature Licenses in the Wadden Sea: <a href="https://puc.overheid.nl/natuurvergunningen/themas/pagina/9664/-/gd/v/0/">https://puc.overheid.nl/natuurvergunningen/themas/pagina/9664/-/gd/v/0/</a>, a recent court case relating to SMCs in the Wadden Sea: <a href="https://www.raadvanstate.nl/@108396/201602719-1-a3/">https://www.raadvanstate.nl/@108396/201602719-1-a3/</a>). These rationales are also used in policy documents (e.g. Policy for SMCs 2021-2026 (Ministry LNV, 2020d)). Therefore, <b>SG60 and SG80 are met.</b></p> <p>There is, however, no formal reporting to all stakeholders that provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings. Hence <b>SG100 is not met.</b></p>				
e	Approach to disputes			

	Guide post	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?	Yes	Yes	Yes
Rationale				
The management system or fishery acts proactively to avoid disputes (see also PI 3.1.2). The PO's fishing plan and accompanying byelaws and Rules for the Settlement of Violations guarantees that infringements are dealt with immediately and strictly. The cooperation between Ministry, Province, PO, VZHK, Shellfish Import Association, NGOs and other stakeholders is fruitful and transparent. <b>SG60, SG80 and SG100 are met.</b>				
References				
PO 2006 a and b ; Vereniging Zeeuwse Hangcultuurkwekers, 2015; Fisheries Law 1963 (Visserijwet 1963): <a href="http://wetten.overheid.nl/BWBR0002416/2015-01-01">http://wetten.overheid.nl/BWBR0002416/2015-01-01</a> ; <a href="https://www.hangcultuurmosselen.nl/">https://www.hangcultuurmosselen.nl/</a> ; <a href="https://www.pomossel.nl/">https://www.pomossel.nl/</a> Informatiebulletin Regelgeving Visserij: <a href="https://www.rijksoverheid.nl/documenten/brochures/2019/12/30/informatiebulletin-visserij-december-2019">https://www.rijksoverheid.nl/documenten/brochures/2019/12/30/informatiebulletin-visserij-december-2019</a> ; <a href="https://www.rvo.nl/onderwerpen/agrarisch-ondernemen/visserij-en-aquacultuur/informatiebulletin-visserij#:~:text=Het%20informatiebulletin%20visserij%20is%20een,voor%20u%20als%20visser%20betekent.">https://www.rvo.nl/onderwerpen/agrarisch-ondernemen/visserij-en-aquacultuur/informatiebulletin-visserij#:~:text=Het%20informatiebulletin%20visserij%20is%20een,voor%20u%20als%20visser%20betekent.</a>				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		>80		
Information gap indicator		Information sufficient to score PI		
Overall Performance Indicator scores added from Client and Peer Review Draft Report				

Overall Performance Indicator score	<b>85</b>
Condition number (if relevant)	-

### 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			
	Guide post	Monitoring, control and surveillance <b>mechanisms</b> exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance <b>system</b> has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A <b>comprehensive</b> 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?	Yes	Yes	<b>UoA 1-2-4: Yes</b>  <b>UoA 3: No</b>  <b>UoA 5: No</b>
Rationale				
<p><b>UoA 1-2-4 (bottom dredge, SMCs, and bottom culture)</b> - A comprehensive monitoring, control and surveillance system has been implemented in the fishery. All vessels are equipped with the AIS-system and the mussel vessels are obliged to install a Blackbox system that records the movement of all authorised vessels in the zone (VMS is not obligatory for coastal shellfish fisheries) and stores the data for 10 years. This allows the Authorities to establish a picture of the fishery's activities. The data are used for the enforcement of management measures. <b>SG60, SG80 and SG100 are met.</b></p> <p><b>UoA 3 (rope culture)</b> – though in most cases the vessels used by the members of the VZHK are equipped with both AIS and black box, the controls carried out by the PO on the black box does not see to the rope culture plots. Also, it is allowed for these fishers to use smaller vessels to inspect the mussels, and carry out work on the systems. Monitoring and control are carried out by the Dutch Food and Consumer Product Safety Authority (NVWA), and in some cases by regional authorities (Rijksuitvoeringsdienst – RUD Zeeland), but this cannot be considered to be comprehensive. <b>SG60 and SG80 are met, but SG100 is not met.</b></p>				

<b>UoA 5 (mussel translocation)</b> – Monitoring and control of the mussel translocation takes place through the registration forms and customs declarations for each shipment, which need to be submitted to the Mussel Auction, and are checked by the NWVA. However, controls are reported to be random and are not regularly carried out. Hence there exists a system, but this cannot be considered to be comprehensive. <b>SG60 and SG80 are met, but SG100 is not.</b>				
b	Sanctions			
	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, <b>are consistently applied</b> and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and <b>demonstrably</b> provide effective deterrence.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>UoA 1-2-4: Yes</b>  <b>UoA 3: No</b>  <b>UoA 5: No</b>
Rationale				
<p><b>UoA 1-2-4 (bottom dredge, SMCs, and bottom culture)</b> - Sanctions to deal with non-compliance exist in the Dutch Visserijwet, the Nature Conversation Law, and in the PO fishing plan and are applied consistently. In order to avoid double punishment, the Government usually waives a sanction if a fisherman is already sanctioned by the PO. The black box system works as a real deterrent because it records all movements for 10 years. At the year 4 surveillance audit, the control agency confirmed once again that though small infringements may occur (e.g. a few farmers got impatient with the slow progress on the culture plot optimisation, and will try to use the new intended plots, resulting in more culture ground being used than licensed), the control agencies remain in close contact with the PO to find a solution to this. The PO has sanctioned a few farmers through the internal commission that deals with enforcement of PO rules (COMBO: Commissie Beoordeling Overtredingen), and the control authorities also follow-up on the suspicion that mussels are grown on unlicensed ground. If they find this to be the case, the farmer will get fined and directed to remove the mussels within 14 days.</p> <p>Another recurring issue is farmers undertaking work outside the licenced hours. This mainly consists of farmers continuing work on the plots after sunset. This has led to one formal warning, but usually is dealt with through informal directions from the authorities to the farmers. However, despite the small infringements listed above, the mussel fishery is considered well organised and complies well with the rules (Nico Laros, Min. LNV., Pers. Comm. 2<sup>nd</sup> February 2021). The vessels always have their Automatic Identification System (AIS) switched on and make mention of their activities to the authorities when required.</p> <p>Experience shows that the system provides effective deterrence and has demonstrated its dissuasive effect. Hence <b>SG60, SG80 and 100 are met.</b></p>				

<b>UoA 3 (rope culture) and UoA 5 (mussel translocation)</b> –sanctions to deal with non-compliance exist in the Dutch Visserijwet, the Nature Conversation Law and are consistently applied, but due to the issues with controls as outlined under Sla, it cannot be said that these <b>demonstrably</b> provide effective deterrence. <b>SG60 and SG 80 are met, but SG100 is not met.</b>				
c	Compliance			
	Guide post	Fishers are <b>generally thought</b> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	<b>Some evidence exists</b> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a <b>high degree of confidence</b> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				
<p>There is a high degree of confidence that fishermen comply with the management system and provide important information. As mentioned above, during the surveillance audits it was reported by the competent authorities that there have been only very few (if any) infringements per year (for all UoAs). At the year 4 surveillance audit (see also Sib), the control agency confirmed once again that though small infringements may occur, the mussel fishery is considered well organised and complies well with the rules (Nico Laros, Min. LNV., Pers. Comm. 2<sup>nd</sup> February 2021). The vessels always have their Automatic Identification System (AIS) switched on and make mention of their activities to the authorities when required.</p> <p>The incentives for non-compliance are also low to non-existent, as the costs for licences are high, and losing a licence means losing all fishing opportunities. Especially with regards to the mussel translocation, the main constraint is that infringements would risk putting the entire system into question – the Ministry and the Province could at any time choose not to licence further imports if it considered that the mussel companies were not in compliance with the requirements.</p> <p>Furthermore, the PO represents the fishermen to speak with the Government, and lines of communication are short. The annual fishing plan is presented to the Ministry of LNV, which has also access to the black box data. Information on research pertaining to the management of the fishery is also made available. <b>SG60, SG80 and SG100 are met.</b></p>				
d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	

	Met?		Yes	
Rationale				
There is no evidence of systematic non-compliance, no major infringements have been reported for years (see also the surveillance reports Sieben, 2018-2019; Seip, 2020; and Sieben et al, 2017, Sieben et al, 2018, Sieben et al, 2019 and Seip et al, 2020). <b>SG80 is clearly met.</b>				
References				
Sieben, 2018-2019, Seip, 2020 and Sieben et al, 2017, Sieben et al, 2018, Sieben et al, 2019 and Seip et al, 2020				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range			>80	
Information gap indicator			Information sufficient to score PI	
Overall Performance Indicator scores added from Client and Peer Review Draft Report				
Overall Performance Indicator score UoA 1-2-4			100	
Overall Performance Indicator score UoA 3			80	
Overall Performance Indicator score UoA 5			80	
Condition number (if relevant)			-	

### PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives		
		There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate <b>some</b> parts of the fishery-specific management system.	There are mechanisms in place to evaluate <b>key</b> parts of the fishery-specific management system.	There are mechanisms in place to evaluate <b>all</b> parts of the fishery-specific management system.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>From the PO, a research plan is available (see projects mentioned in section 6.4.1). In addition, the PO has signed an agreement with WMR in order to carry out ad hoc research if necessary. The VZHK currently is in discussions with the HZ for additional research on the rope cultures, though at the time of the site visit, no research plan was available. However, research on fisheries and environmental aspects is also part of the Natura 2000 Management Plans for the Wadden Sea, Voordelta, Oosterschelde and Lake Grevelingen, and the accompanying licences. The Natura 2000 Management Plans cover the period from 2015-2021 (VD) or 2016 to 2022 (other areas) and stipulate regular evaluation in order to find out whether and to what extent the measures contribute to achieving the conservation objectives.</p> <p>Furthermore, the Policy paper from 1993 (Vissen naar evenwicht) has been evaluated in 2002 before the new Policy Decision (Ruimte voor een zilte oogst), the basis for the government's policy on mussel fishery and culture in the Wadden Sea and the Oosterschelde, has been formulated in 2004. The current policy document covers the period from 2005 to 2020. This document will be evaluated at the end of the term before a new policy is prepared, though at the time of writing it is not clear if this is currently underway. The Transition Agreement and its Implementation Plan are subject to regular reviews by the undersigned parties, being the Ministry, the POs and some NGOs. There are mechanisms in place to evaluate key parts of the fishery-specific management system, thus <b>SG60 and SG80 are met</b>, but a comprehensive approach to review all parts of the fishery-specific management system does not exist for any of the UoAs. Hence <b>SG100 is not met</b>.</p>				
b	Internal and/or external review			



	Guide post	The fishery-specific management system is subject to <b>occasional internal</b> review.	The fishery-specific management system is subject to <b>regular internal</b> and <b>occasional external</b> review.	The fishery-specific management system is subject to <b>regular internal and external</b> review.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				
<p>As discussed under Sla, the fishery-specific management system is subject to regular review, though this is mainly to be considered internal review by the parties involved. e.g. the Transition Agreement and its Implementation Plan are subject to regular reviews by the undersigned parties.</p> <p>Research results are available to interested parties and disseminated to stakeholders in a timely fashion, through updates stakeholders receive in e.g. the VIZ or in relation to the Transition Agreement. Stakeholders also receive updates on monitoring results from the Natura 2000 management plans through the review process of these plans. Therefore, the management system is subject to an ongoing external scrutiny by stakeholders and NGOs engaged in the protection of the Natura 2000 areas. Key parts of the management are also reviewed by external research institutes (e.g. Sovon, with a focus on birds, or Royal Netherlands Institute for Sea Research and Wageningen Marine Research) or external consultants (e.g. the SMC policy has been reviewed externally in 2019) at the request of the government.</p> <p>The SIMP is reviewed regularly in relation to new policies and licence requirements and updated where needed by Gimaris, which technically is an external consultant, though hired by the industry. The Dutch invasive species policies are reviewed by a wider audience however, which constitutes an occasional external review (<a href="http://invasieve-exoten.nl/">http://invasieve-exoten.nl/</a>).</p> <p>Based on the above it can be said that the fishery-specific management system is subject to regular internal and occasional external review. <b>SG60 and SG80 are met</b>. However, this cannot be considered to be a <u>regular</u> external review. Hence <b>SG100 is not met</b>.</p>				
References				
<a href="http://invasieve-exoten.nl/">http://invasieve-exoten.nl/</a>				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report				
Draft scoring range		>80		
Information gap indicator		Information sufficient to score PI		
Overall Performance Indicator scores added from Client and Peer Review Draft Report				

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	-

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## 8 Appendices

### 8.1 Assessment information

#### 8.1.1 Previous assessments

The Netherlands blue shell mussel fishery and Netherlands suspended culture mussel fishery were previously assessed together at the last re-assessment in 2016. The fisheries were originally certified by SGS in July 2011. The certification process has subsequently been undertaken by MacAlister Elliott & Partners Ltd (MEP), which changed to ME Certification Ltd (MEC), and is now known as Control Union UK (CU UK, known before as CU Pesca).

The fishery entered a combined re-assessment on the 10<sup>th</sup> September 2015 and the certificate was awarded on 27 Oct 2016. The fishery was recertified with no conditions or recommendations, and no conditions or recommendations were raised during the annual surveillances (year 1-3).

The Mussel translocation into the Oosterschelde was first certified on the 27<sup>th</sup> January 2016 by ME Certification (MEC, now Control Union UK – CU UK). The initial assessment team consisted of Dr Jo Gascoigne (Team Leader, Principle 1), Chrissie Sieben (Principle 2) and Ulf Löwenberg (Principle 2, Principle 3). The fishery was certified with no conditions or recommendations, and no conditions or recommendations were raised during the annual surveillances (year 1-4).

#### 8.1.2 Small Scale fisheries

**Table 18. Small scale fishery- summary**

UoA	Percentage of vessels with length <15 m	Percentage of fishing activity completed with 12 nautical miles of shore
UoA 1	0%	100
UoA 2	0%	100
UoA 3	5%	100
UoA 4	0%	100
UoA 5	N/a	100

### 8.2 Evaluation processes and techniques

#### 8.2.1 Site visits

The reassessment site visit was carried out on-site in tandem with the surveillance audit. The site visit was held on the 3<sup>rd</sup> December 2020, at the Dutch Mussel Auction in Yerseke. The individuals met during the site visit and their roles in the fishery are listed in Table 19.

Following the site visit, a video call was held on 8<sup>th</sup> December 2020 with CWN and Natuurmonumenten, in light of the stakeholder comments provided, and with Nico Laros from the Ministry of LNV (Wadden Unit) on 2<sup>nd</sup> February 2021 to discuss control and enforcement in the mussel fishery.

**Table 19. List of attendees at the site visit meetings.**

Name	Position	Type of consultation
<b>Cora Seip-Markensteijn</b>	CU UK	On-site 3 <sup>rd</sup> December 2020, remote 8 <sup>th</sup> December 2020
<b>Chrissie Sieben</b>	CU UK	Remote, 3 <sup>rd</sup> December 2020 and 8 <sup>th</sup> December 2020
<b>Paula Huissen</b>	PO Mosselcultuur	On-site, 3 <sup>rd</sup> December 2020
<b>Addy Risseeuw</b>	PO Mosselcultuur	On-site, 3 <sup>rd</sup> December 2020, remote 8 <sup>th</sup> December 2020
<b>Nico van Zantvoort</b>	Dutch Mussel Auction	On-site, 3 <sup>rd</sup> December 2020
<b>Peter van de Boomgaard</b>	Dutch Mussel Auction	On-site, 3 <sup>rd</sup> December 2020
<b>Joyce van Wijk</b>	MSC NL (observer)	Remote, 3 <sup>rd</sup> December 2020
<b>Henrice Jansen</b>	Wageningen Marine Research (WMR)	Remote, 3 <sup>rd</sup> December 2020
<b>Karin Troost</b>	Wageningen Marine Research (WMR)	Remote, 3 <sup>rd</sup> December 2020
<b>Mascha Dedert</b>	Zeeuwse Milieufederatie (Zmf)	Remote, 3 <sup>rd</sup> December 2020
<b>Eeke Haanstra</b>	Coalitie Wadden Natuurlijk (CWN)	Remote, 8 <sup>th</sup> December 2020
<b>Roef Mulder</b>	Vogelbescherming/Natuurmonumenten	Remote, 8 <sup>th</sup> December 2020
<b>Frans van Zijderveld</b>	Natuurmonumenten	Remote, 8 <sup>th</sup> December 2020
<b>Nico Laros</b>	Ministerie LNV, Waddenunit	Remote, 2 <sup>nd</sup> February 2021

### 8.2.2 Stakeholder participation

The information obtained during the site visit has been incorporated throughout the main report; however key points are summarised below:

- PO Mossel, VZHK, Import Association: Information about traceability from harvest to 1<sup>st</sup> point of sale, details on fishing operations, gear use.
- Dutch Mussel Auction: Information about traceability from harvest to 1<sup>st</sup> point of sale, and on by-catch information from the cultch.
- Wageningen Marine Research: Information on stock surveys, carrying capacity and other data collection regarding mussels (PRODUS, KOMPRO), information on potential by-catch (cultch)
- Environmental NGOs (Natuurmonumenten, CWN, Zmf): contribution to 'RBF workshop' (see section 8.2.3 below) and discussion of stakeholder comments (see also section 8.4).
- Ministry LNV: Information about the management of the fishery (regulations, enforcement, infringements).

Information was provided through emails, during the site visit calls and again through email exchanges afterwards.

### 8.2.3 Evaluation Techniques

**a) Media announcements:** CU UK selected the MSC as main media outlet. The MSC press release targeted a wide range of stakeholders within the sustainable seafood industry, ensuring that key stakeholders were notified of this fishery's announcement.

Aside from the general communication to stakeholders about the assessment, the team also reached out to a few stakeholders directly, to ensure their participation during the site visit. This was done by team member Cora Seip-Markensteijn in Dutch.

**b) Methodology for information gathering:** Review of data and documentation, interview of stakeholders.

**c) Scoring process:** Scoring was agreed by the team via skype and 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	FAIL	65	85
More than half	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 16

#### **f) Use of the RBF**

The use of the RBF was announced at the same time as the announcement of the initial assessment and site visit.

During the site visit, a separate call to conduct the RBF workshop was held. Participants to the RBF workshop are listed in Table 19. However, during the call, stakeholders present at the site visit agreed that no RBF on 'main' species was required (see also PI 2.2.1), as bycatch could be identified and quantified for all relevant UoAs (2-3-4). Therefore, the Default Assessment Tree has been used to score the secondary species outcome.

### **8.3 Peer Review Reports**

## Peer Reviewer A – General Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	<p>Yes, this is a well researched and well managed fishery, many parts of which has been certified for a considerable period, and hence there is a lot of information, and it is therefore no surprise to find relatively little to comment on. Occasionally one needs to refer back to previous certification reports (which in one case simply referenced back to even earlier ones) but all the key information required is present in this report, and generally well presented and easy to follow.</p> <p>Although I have said yes I am not 100% clear on the justification for no harmonisation discussion, at least in respect of 2.4.2 (evidence that VMEs are being protected by all MSC UoAs at SG80) in the Wadden Sea.</p> <p>Obviously I would expect the relevant P2 sections may need to be carefully checked at first annual audit since the imminent anticipated, but not granted) multi-year license (dependent upon the appropriate assessment determining in essence that sufficient mussels remain for bird feeding) had not been granted at the time of the assessment. Should this not have been granted this has implications for the optimisation of mussel plots and hence the general progress of the mussel transition agreement. At this stage I agree entirely with the assessment progressing on the basis of information available.</p>	<p>Mussel beds are specifically targeted by the UoA and there is no overlap with other MSC fisheries in this regard. The only other Dutch shellfish fishery in the MSC programme is the OHV Dutch Waddenzee and Oosterschelde Hand Raked cockle fishery which does not overlap with this habitat type (and harmonisation would not be required anyway as it was assessed against the previous standard version (1.3)).</p> <p>Yes, all this information is checked on an annual basis (should this fishery become recertified). This includes any new licenses and associated appropriate assessments.</p>



Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.2, 7.18.1 and sub-clauses]	NA	None raised	Thank you, no comment 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]		Note: Include this row for assessments completed against FCR v1.3 and v2.0, but not for FCP v2.1/v2.2 (in which the client action plan is only prepared at the same time as the peer review). Delete this text from the cell for FCR v1.3/v2.0 reviews or delete the whole row if FCP v2.1/v2.2.	N/A
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	Yes	Yes environmental issues specifically relevant to relaying and rope grown culture, are clearly discussed and considered. So is translocation which is arguably an intrinsic part of some of these activities.	Thank you, no comment required.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.	NA	The report is very comprehensive and well written, easy to follow and understand, with few errors. Nevertheless one or two are highlighted below.	Thank you, no comment required.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed	NA	On Page 9 (section 1.2, first paragraph) the reader is referred to previous certification reports for background information (Gascoigne et al 2016a and b) but the hyperlinks provided seem to refer back to ME's own server requiring login status - these should either be removed or should refer to the documents on the MSC website.	Ok, thank you, we have now amended that hyperlink.

below, including the codes in Columns A-C.			
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.	NA	There are formatting issues (unwanted paragraph return) in each location where "Table 10" is cross referenced	Ok, thank you, we have now amended that.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.	NA	In section 6.6.1 "The Regional government of Zeeland Province also have policies dedicated to shellfish fisheries, one of which is the import policy discussed in section" (missing cross reference at end of sentence)	Ok, thank you, we have now added that cross-reference.

#### Peer Reviewer A – PI Comment

UoA gear	PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
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UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.1.1	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any meaningful impact on stocks	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.1.2	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any meaningful impact on stocks	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots	1.1.3	Yes	Yes	NA	This PI correctly not scored as none of these four UoAs have any potential impact on stocks or genetics	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	1.1.3	Yes	Yes	NA	I agree that SG100 is not met due to a lack of certainty, based on the recent recognition of more gallo alleles in certain habitats than previously recognised.	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.2.1	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any meaningful impact on stocks	Thank you, no comment required.	NA (No response needed)

UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.2.2	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any meaningful impact on stocks	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.2.3	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any meaningful impact on stocks	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.2.4	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any meaningful impact on stocks	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.2.5	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any hatchery activity	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; import from elsewhere in Europe; ongrowing on ropes and on culture plots	1.2.6	NA (PI not scored)	NA (PI not scored)	NA	This PI correctly not scored as none of the UoAs have any hatchery activity	Thank you, no comment required.	NA (No response needed)

UoAs 1-4 Seed collection by SMC & dredging; on-growing on ropes and on culture plots	2.1.1	Yes	Yes	NA	This PI correctly scored at 100 due to lack of primary species.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.1.1	NA (PI not scored)	NA (PI not scored)	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; on-growing on ropes and on culture plots	2.1.2	Yes	Yes	NA	This PI correctly scored at 100 due to lack of primary species.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.1.2	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; on-growing on ropes and on culture plots	2.1.3	Yes	Yes	NA	This PI correctly scored at 100 due to lack of primary species.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.1.3	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; on-growing on ropes and on culture plots	2.2.1	Yes	Yes	NA	This PI correctly capped at 80 due to lack of secondary main, and no RBF carried out on minor secondary species..	Thank you, no comment required.	NA (No response needed)

UoA 5 Translocation from elsewhere in NW Europe	2.2.1	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots	2.2.2	Yes	Yes	NA	I agree with the score and reasoning.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.2.2	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots	2.2.3	Yes	Yes	NA	I agree with the score and reasoning. Although there is clearly more information for some parts of the fishery than others (e.g. no inventory of species for SMCs in the Waddenzee) the assumptions made, and hence scores, are reasonable.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.2.3	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)

UoAs 1-4 Seed collection by SMC & dredging; on-growing on ropes and on culture plots	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	With respect to eider feeding, there is a lot of information presented on both the mussel transition agreement and the VKA-scheme, and clearly a huge amount of effort by the management is going into this. I suspect the scoring is correct but a slightly clearer summary may be required (or potentially a rescore). The transition agreement is clearly behind original expectations (but has been renegotiated and only recently became mandatory). It is also stated that it's progress is dependent on it being economically viable for the fishery, whilst evidence of it possibly not being economically viable is also presented (statement that alternative plots are often less productive than those previously used); there is of course also evidence that it may only result in very limited additions of long term stable natural mussel beds. Overall I can accept that this does not lead to a score of less than 80 if the VKA agreement ensures every year that there is sufficient food remaining for the eider population to be well fed	The mussel transition agreement is only a part of the overall strategy to mitigate impacts on eider ducks. The quality of SMC seed production sites has indeed been an issue for the implementation of the previous transition agreement, and for this reason a larger 760 Ha have been made available to the SMC installations which enables flexibility in site selection to maintain site quality and therefore overall productivity of the SMC sector. The VKA scheme is an integral part of this overall strategy in that it ensures that, given the generally better quality of mussels on culture plots and the fact that eiders also forage on those plots, there are no significant effects from the mussel seed fishery + culture + removal (Vissen, Kweken, Afvoer in Dutch - VKA) on the species overall. In this context, the management system has to ensure that the amount of available mussels for food in the coming winter would not be less than in a situation where there would be no fishing. Therefore, the 'surplus' needed changes	Accepted (no score change, change to rationale)
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					and in good condition. However, the rationale only states that the VKA-scheme ensures there is a surplus, but not how much; it is not clear to me that that surplus is enough to ensure plenty of food for eiders and other mussel consumers. This should be clarified and, if necessary, rescored.	each year as it is determined on the basis of seed banks that are open to the seed fishery. We have made this clearer by adding the VKA model calculation table to the figure. The scoring has not changed.	
UoAs 1-4 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	I believe that eiders feeding on mussel plots or suspended culture is an issue in many mussel operations, including in the DWZ, and that in the past suspended rope farmers have been given licenses to shoot them in Sweden for example, (they no longer do, but still may use nets or deliberate disturbance by boats - see the Scanfjord Rope Grown Mussels MSC assessment). Is this an issue in these fisheries? - there is no mention of it.	No, this has never been mentioned by either the fishery client or stakeholders. General disturbance is mitigated by prohibiting any fishing activities within 500m from breeding or foraging birds. The majority of SMCs and suspended culture installations are located beyond these limits, and for those that are not, any risks are reviewed through appropriate assessments that are carried out as part of any SMC or suspended culture licence application. This has already been stated in the	Not accepted (no change)



						rationale. No changes to scoring were made.	
UoA 5 Translocation from elsewhere in NW Europe	2.3.1	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; on-growing on ropes and on culture plots	2.3.2	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	NA	<p>See above for 2.3.1 with respect to sufficiency of the VKA-scheme.</p> <p>Additionally one strand of the strategy appears to be that all of the intertidal is also closed to the mussel fishery. However there is no mention of whether this helps significantly (are there significant resources of intertidal mussels or are these very minor?). It would help if this was clarified.</p>	<p>Please see our response above.</p> <p>We have added clarification to the text. All of the intertidal zone is also closed to the mussel fishery: the Dutch Wadden Sea lost virtually all (~4000 ha) its intertidal mussel beds around 1990 due to overfishing in combination with storms and recruitment failure. Re-establishment is now occurring, albeit slowly, as factors outside the fishery's control – such as the spread of Pacific oysters – influence mussel resettlement (Christianen et al., 2017). The scoring has not changed.</p>	Accepted (no score change, change to rationale)
UoA 5 Translocation from elsewhere in NW Europe	2.3.2	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)

UoAs 1-4 Seed collection by SMC & dredging; on-growing on ropes and on culture plots	2.3.3	No (scoring implications unknown)	No (change to rationale expected, not to scoring)	NA	See above for 2.3.1 with respect to sufficiency of the VKA-scheme. As there are multiple scoring elements (birds; harbour porpoise; seals) I would have thought there might be potential for a higher score than 80 as the amount and quality of information available for harbour porpoise and seals is very high.	Please see our response above.  Indirect impacts (through disturbance and reduced food availability) are difficult to measure with a high degree of certainty. Although the information available is sufficient for SG80 to be met, the team maintains that there is no high degree of certainty (95% confidence). The scoring has not changed.	Not accepted (no change)
UoA 5 Translocation from elsewhere in NW Europe	2.3.3	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoA 1 Seed collection by SMC	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 2 Seed collection by dredging; on-growing on ropes	2.4.1	Yes	Yes	NA	It may in future be worth enquiring of the relevant Dutch Authority (LNV?) whether the transient seed beds are considered as biogenic features of the sand banks, or only the more long lived mussel beds with adult mussels. However, this is not an important point as	There is no confusion about this. Unstable, transient beds are not considered to make any significant contribution to the maintenance of the N2000 habitat. This is explained in Section 6.4.6. and in the rationale.	NA (No response needed)

					I agree with the scoring and rationale.		
UoA 3 Ongrowing on ropes	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 4 Ongrowing on culture plots	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.4.1	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoA 1 Seed collection by SMC	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 2 Seed collection by dredging; ongrowing on ropes	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 3 Ongrowing on ropes	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)

UoA 4 Ongrowing on culture plots	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.4.2	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoA 1 Seed collection by SMC	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 2 Seed collection by dredging; ongrowing on ropes	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 3 Ongrowing on ropes	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 4 Ongrowing on culture plots	2.4.1	Yes	Yes	NA	I agree with the rationale and scoring.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.4.3	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1,3 Seed collection by SMC; ongrowing on ropes	2.5.1	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)

UoAs 2,4 Seed collection dredging; ongrowing on culture plots	2.5.1	Yes	Yes	NA	I agree with the scoring and largely with the rationale. As a small point, the rationale states that the effect of the fishery is "essentially to move organisms (mussels and associated fauna) around, on a local level,..... rather than to affect overall biomass and species composition in any significant way ". Since the fishery collects both seed mussels with low prospect of surviving to adulthood and spat that would otherwise have relatively little likelihood of settling, and then relays them in areas where they have a better chance of surviving to marketable size - and sometimes with control of predators by their removal prior to relaying - I would have thought there was a realistic chance of it creating a significantly enhanced overall mussel biomass (and hence biodiversity).	We have added clarification in that no significant, negative, impacts are expected.	Accepted (no score change, change to rationale)
UoA 5 Translocation from elsewhere in NW Europe	2.5.1	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)

UoAs 1-4 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots	2.5.2	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.5.2	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoAs 1-4 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots	2.5.3	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.5.3	Yes	Yes	NA	Not scored; reasoning for this is correct.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	2.6.1	No (non-material score reduction expected)	No (non-material score reduction expected)	NA	It is unclear how the team have scored this at 100, since oyster drills appear to have arrived recently and it is in theory possible this has occurred due to the translocation activities, although it could also have been by other means - no information is presented on how the introduction occurred. Note also that in much of the report the oyster drill in the Oosterschelde is referred to as	We have added more clarification to the rationale, distinguishing more clearly between the two oyster drill species. Both introductions happened before the implementation of the import monitoring protocol and before the first initial assessment of the fishery. The Atlantic oyster drill is still considered a problem species (this was confirmed by A. Gittenberger) as it is present	Not accepted (no change)

					<p>the Japanese Oyster Drill <i>Ocenebra inornata</i> (sic; correct spelling <i>inornata</i>) but in this PI discussion only the Atlantic oyster drill <i>Urosapinx cinerea</i> is mentioned, this should be clarified (which? or both?). I appreciate that this particular species (whichever it is, to be clarified) is no longer relevant in the sense that it is no longer a species of concern in this regard (being already present), but it was previously. Therefore in the absence of any certainty that it's/their arrival was not due to introduction, there can not be sufficient confidence in the outcome to justify a score of 100; this also has implications for management strategy and information PIs, see below.</p>	<p>in only very localised areas in the Oosterschelde and its spread can therefore still be limited - if detected during SASIs or big bag sampling, mitigation measures would be required. In contrast, the Japanese oyster drill has become established in many areas within Europe following its likely introduction with oyster imports and is therefore no longer considered a problem species. Because these introductions predate the activities we are assessing now, and because effective management measures are now in place, we have maintained our scoring at SG100.</p>	
UoA 5 Translocation from elsewhere in NW Europe	2.6.2	No (non-material score reduction expected)	No (non-material score reduction expected)	NA	<p>See above comment for 2.6.1 regarding lack of information about how oyster drills arrived; I am not convinced that SI (a) should score 100 for this reason. no additional comments.</p>	Please see 2.6.1 for our response.	Not accepted (no change)

UoA 5 Translocation from elsewhere in NW Europe	2.6.3	No (scoring implications unknown)	No (scoring implications unknown)	NA	See above for 2.6.1 regarding lack of explanation /information about how oyster drills arrived; further information is required if available; No additional comments.	Please see 2.6.1 for our response.	Not accepted (no change)
UoAs 1-5 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots; translocation from elsewhere in NW Europe	3.1.1	Yes	Yes	NA	I agree with the scoring and rationale	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots; translocation from elsewhere in NW Europe	3.1.2	Yes	Yes	NA	I agree with the scoring and rationale	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots; translocation from elsewhere in NW Europe	3.1.3	Yes	Yes	NA	I agree with the scoring and rationale	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots; translocation from elsewhere in NW Europe	3.2.1	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)



UoAs 1-5 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots; translocation from elsewhere in NW Europe	3.2.2	Yes	Yes	NA	I agree with the scoring and rationale although in SI(d) the explanation "Licences and other legal decisions (e.g. ref court case summary) explain why actions were taken or not taken" could be made more clear.	Ok. Thank you, we've provided an example to make the rationale clearer	Accepted (no score change, change to rationale)
UoAs 1,2&4 Seed collection by SMC & dredging; ongrowing on culture plots	3.2.3	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)
UoA 3 Ongrowing on ropes	3.2.3	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)
UoA 5 Translocation from elsewhere in NW Europe	3.2.3	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)
UoAs 1-5 Seed collection by SMC & dredging; ongrowing on ropes and on culture plots; translocation from elsewhere in NW Europe	3.2.4	Yes	Yes	NA	I agree with the scoring and rationale.	Thank you, no comment required.	NA (No response needed)

## 8.4 Stakeholder Input

Upon the publication of the ACDR, a formal submission was received from Coalitie Wadden Natuurlijk (CWN). The submission and team response are shown below.

### 8.4.1 CWN submission

The Coalitie Wadden Natuurlijk (CWN) is a partnership of seven eNGOs in the Dutch Wadden Sea. The parties represented in the Coalition are: Waddenvereniging, Vogelbescherming Nederland, Natuurmonumenten, Landschap Noord Holland, It Fryske Gea, het Groninger Landschap en Stichting WAD. The below comments were received on the 19<sup>th</sup> November 2020, following publication of the Announcement Comment Draft Report (ACDR).

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
2.2.1 - Secondary species outcome	Fishery has a negative effect on associated fish densities	The abundance and biodiversity of fauna living within a biogenic reef of bivalves such as mussels, increase with complexity and area, and promotes fish growth and diversity (Carbines et al. 2004; Norling and Kautsky 2007, 2008). Especially smaller fish species such as common goby, rock goby and butterfish, but also larger fish like flatfishes use mussel beds as habitat for either direct foraging, breeding or as a nursery area (Jones and Clare 1977). The overall effects of increased complexity due to the presence of older mussel bed can thus be relatively substantial for fish (Kristensen et al. 2015). A loss of (complex) structure, due to mussel seed fisheries will consequently result in a loss of these associated species. Smaal et al. (2013) demonstrated that typical fish species, that are associated with mussel beds (such as butterfish, eelpout, lesser and greater pipefish, common sea snail, bull-rout, goby and fivebeard rockling) showed a decline in numbers directly after mussel seed fisheries.	Carbines, G., Jiang, W., Beentjes, M.P. (2004). The impact of oyster dredging on the growth of blue cod, <i>Parapercis colias</i> , in Foveaux Strait, New Zealand. – Aquatic Conservation: Marine and Freshwater Ecosystems 14: 491–504. Norling, P. & Nils Kautsky (2007). Structural and functional effects of <i>Mytilus edulis</i> on diversity of associated species and ecosystem functioning. Marine Ecology Progress Series 351: 163-175 Norling, P. & Nils Kautsky (2008). Patches of the mussel <i>Mytilus</i> sp. are islands of high biodiversity in subtidal sediment habitats in the Baltic Sea. Aquatic Biology 4: 75-87 Jones, D., Clare, J. (1977). Annual and long-term fluctuations in the abundance of fish species inhabiting an intertidal mussel bed in Morecambe Bay, Lancashire. – Zoological Journal of the Linnean Society 60: 117–172. Smaal, A., Craeymeersch, J., Drent, J., Jansen, J., Glorius, S., Van Stralen, M. (2013) Effecten van mosselzaadvisserij op sublitorale natuurwaarden in de westelijke Waddenzee: samenvattend eindrapport. IMARES. Rapport C006/13 PR1	Scoring implications unknown	Not accepted (no score change)
<b>CAB response to stakeholder input</b>		The Secondary species component of the standard only looks at species that are included in the catch. Macrofauna like fish are not caught in this fishery, due to the low fishing speed and dedicated mussel dredge. An analysis of 2020 auction data carried out by the Dutch Mussel Auction shows that on average, the ‘tarra’ (cultch) component amounted to 17.2% of the total weight of mussel batches brought to auction; this includes empty shells, stones, as well as other invertebrates. Amongst the latter, 1.13% of the total amounted to barnacles ( <i>Balanidae</i> spp.) and 0.1% to slipper limpets ( <i>Crepidula fornicata</i> ). On that basis, no ‘main’ secondary species were identified. An effect such as described on associated benthic animals would come under PI 2.4.1 (and further): habitat outcome, where the impact of the UoA on habitat structure and function (i.e. in relation to associated species) is scored. Serious or irreversible harm to “structure or function” for the habitat component means the reduction in habitat structure, biological diversity, abundance, and function such that the habitat would be unable to recover to at least 80% of its unimpacted structure, biological diversity and function within 5-20 years, if fishing were to cease entirely			

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		(MSC FS V2.01 Table SA8). The current available information, such as Troost et al (2019) and PRODUS (Smaal et al, 2013) do not show these long-term effects of the mussel fishery on habitats. This is further detailed under PI 2.4.			
2.2.1 - Secondary species outcome	Fishery has a negative effect on associated macrofauna densities	Research has shown that on short-term the mussel seed fishery has a negative effect on the total density, number of organisms and species richness of associated benthic animals (excluding mussels). Also the species diversity of larger benthic animals was lower on places where mussel densities were low (Smaal et al. 2013; van Stralen et al. 2013). Recovery of associated macrofauna was only seen after not disturbing the area for <1 to 1.5 years. Due to short nature of the monitoring system, statements on long-term effects of mussel seed fisheries could not be made by research (o.a. Troost et al. 2018). Since mussel seed fishing effort is repeated every year, the fishery withholds the associated benthic animals to recover. The current fishing practise has an inevitable effect on both short-term and long-term.	Van Stralen, M., Craeymeersch, J., Drent, J., Glorius, S., Jansen, J. & A. Smaal (2013). Het mosselbestand op de PRODUS-vakken en de effecten van de visserij daarop: Effecten van mosselzaadvisserij op sublitorale natuurwaarden in de westelijke Waddenzee. Marinx. Smaal, A., Craeymeersch, J., Drent, J., Jansen, J., Glorius, S., Van Stralen, M. (2013) Effecten van mosselzaadvisserij op sublitorale natuurwaarden in de westelijke Waddenzee: samenvattend eindrapport. IMARES. Rapport C006/13 PR1 Troost, K., van Stralen, M., Craeymeersch, J., van den Ende, D. & M. van Asch (2018). Ontwikkeling van bodemdieren in voor mosselzaad- en garnalenvisserij gesloten gebieden in de westelijke Waddenzee. Evaluatie na drie jaar monitoring. Wageningen Marine Research, Wageningen UR (University & Research centre), Wageningen Marine Research rapport C013/18.	Scoring implication s unknown	Not accepted (no score change)
<b>CAB response to stakeholder input</b>		As already explained above, the secondary species outcome of the standard only looks at species that are included in the catch. As detailed, there are no 'main' Secondary species in this assessment. Effects on associated benthic animals would come under the habitat component (2.4).			
2.3.1 - ETP species outcome	The goals of the transition-agreement (Mossel Convenant 2008) have	Eider duck populations in the Dutch Wadden Sea (both breeding and non-breeding) have declined in recent years (Blew et al., 2017) and are below their Natura 2000 objectives (de Vlas et al., 2014). It is acknowledged that a lack of shellfish beds, both subtidal and intertidal, is likely to have contributed to the decline (Reduced Reassessment Report 2020 page 63). The mussel fishery	<a href="https://rijkwaddenzee.nl/wp-content/uploads/2019/07/Jaarverslag-Mosseltransitie-2018.pdf">https://rijkwaddenzee.nl/wp-content/uploads/2019/07/Jaarverslag-Mosseltransitie-2018.pdf</a>	Score reduction expected to 60-80, condition raised	Not accepted (no change)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
	not been met. By the end of 2020 a small portion of the fishery made the transition to sustainable off-bottom techniques instead of the agreed upon 100% transition by 2020. The PCR report shows on page 24 a detailed figure of the transition steps (PvU), which clearly indicates that the fishery nowadays has not even reached its goals of the year 2010. Progress of transition is	is identified as a potential (or past) source of impact for this species and the management of the mussel fishery (transition agreement) forms the core of the action set out to try and increase both breeding and non-breeding populations (PCR 2016 page 29). The implementation of this agreement is one of the key actions identified under Natura 2000 to restore Dutch eider duck populations (de Vlas et al., 2014). On the basis of compliment of this agreement and the Natura 2000 action plan the CAB rewarded (closure of 40% of the area by 2018 and 100% in 2020) the fishery a SG of 80 on PI 2.3.1 in 2016 (PCR 2016 page 75). Since the industry has not been able to proceed any closure after the MSC certification year of 2016, we believe that the mussel fishing industry still poses a risk of serious harm to the Eider duck populations and hinders the recovery of this species. Therefore, we argue for a rescore reduction and the PI 2.3.1. to fail or at least a condition should be raised for this PI.			

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
	more than 10 years behind target. Consequently , the majority of the blue mussel fishing effort still poses a serious risk to the Eider duck population.				
<b>CAB response to stakeholder input</b>		<p>The decline of the eider duck populations has indeed been recognised (SOVON, 2020) and this is made clear in the assessment report. However, the cause of the decline is opaque and not solely the result of the mussel fishery; other factors are in play such as the spread of the Japanese oyster (which is not a suitable food source for eiders), climate change, pollution and reduced nutrient input. The Transition Agreement, and accompanying closures of fishing areas, is one important part of the effort to reduce the impact of the fishery on the eider ducks. The initial aim was that this transition would be achieved by 2020; however, there is an acknowledgement that the transition has to be based on trial and error, with step-wise implementation and monitoring of results and that this target may therefore be adjusted on the basis of research results, evaluation, and experience (Rijkswaterstaat, 2015). The transition was initiated in 2009, with an annual closure of 20% of spring mussel beds to the seed fishery, which was subsequently increased to 40% in 2013. An evaluation of the agreement in 2013 revealed that the 2020 target was not achievable; the stepwise increase in spring mussel bed closures therefore continues. As outlined under PI 2.3.1c, a new agreement was reached in December 2020 between the Coalitie Wadden Natuurlijk, the PO Mosselcultuur and the Ministerie van Landbouw, Natuur en Voedselkwaliteit (LNV): from Spring 2021, 36% of the Dutch Wadden Sea will already have been closed to the bottom seed fishery. This will be gradually increased to 50% in 2022 and 65% in 2026. The intent is to achieve a 100% closure by 2029, but only if this is economically viable for the mussel sector. In addition to this agreement, measures are in place for the bottom culture as well, based on the concept that the combination of fishing, cultivation and the eventual removal of mussels does not lead to fewer mussels in the Wadden Sea and affect overall food availability for reliant bird species such as eider ducks. The implementation of this VKA-scheme is part of the Nature-licence for the fishery. Using the results of the PRODUS study, the model was adjusted in 2014 and improved, and replaced the more general rule that that 85% of the mussel spat fished during the spring fishery (or the biomass equivalent) needs to remain on the mussel plots in the Wadden Sea for up to 1 year and thus cannot be moved to the Oosterschelde during winter. As shown in PI 2.3.2c, there has been a surplus of mussels remaining in the Wadden Sea. On this basis, the team does not agree that the fishery poses a risk of</p>			

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		serious harm to the population. There has been no rescoring. The rationale has, however, been amended the reflect the latest developments regarding the Transition Agreement and VKA model.			
2.3.2 - ETP species management	The goals of the transition-agreement (Mossel Convenant 2008) have not been met. By the end of 2020 only a small portion of the fishery made the transition to sustainable off-bottom techniques instead of the agreed upon 100% transition by 2020. The PCR report shows on page 24 a detailed figure of the transition steps (PvU),	The PCR (2016) already stated that (under PI 2.3.2) : ‘ Whilst there is evidence that the Transition Agreement is being implemented successfully (annual surveys of MZI production since 2011 show increases in production, with 28% of the area closed so far, to reach 40% in 2018 - see Section 2.3.1.2 and Programma ‘Naar een Rijke Waddenzee’, 2014), the team noted that the process of replacing seed mussel dredging by MZIs is behind the initial 2008 schedule. There is therefore no clear evidence that the strategy is being implemented successfully.’ (page 79) Since 2016 the amount of closed area has not been increased at all. All the other measures mentioned under PI 2.3.2 (Reduced Reassessment report 2020) are not executed by the fishery itself and therefore cannot be categorized as precautionary management strategies in place by the UoA. The only management in place by the UoA on ETP species management is in the form of the Transition Agreement. Currently only 28 percent of the transition has been realized and (no more than) 7.7% is underway. The mussel fishing sector fails to further invest in off-bottom techniques and closing areas. For this reason, we conclude that there is no evidence that the management strategy is being implemented by the industry. We advocate for a score reduction of this PI.	<a href="https://rijkwaddenzee.nl/wp-content/uploads/2019/07/Jaarverslag-Mosseltransitie-2018.pdf">https://rijkwaddenzee.nl/wp-content/uploads/2019/07/Jaarverslag-Mosseltransitie-2018.pdf</a>	Score reduction expected to 60-80, condition raised	Not accepted (no change)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
	<p>which clearly indicates that the fishery nowadays has not even reached its goals of the year 2010. Progress of transition is more than 10 years behind target. Consequently , the majority of the blue mussel fishing effort still poses a serious risk to the Eider duck population.</p>				
<b>CAB response to stakeholder input</b>		<p>The implementation of the Mussel Agreement, though an important part of the management strategy, is not the only element of the strategy to ensure that the UoA does not hinder recovery of ETP species. The VKA-system as described above is also an important part of the management of impacts on ETP species (in this case, specifically eider ducks, though other shellfish eating birds might also benefit), as is the Nature licence, which is based on an assessment to ensure that the activity has no significant negative impact on the Natura-designated species (e.g. seals and porpoise, as well as birds). As we have explained in our – now revised – scoring rationale, a management strategy is clearly in place, which means that scoring issue a SG80 is met. Please note that UoA management can be part of a wider management framework from which the UoA benefits (such as N2000). As to whether the ‘strategy is being implemented by the industry’ (scoring issue d), the ongoing area closures and newly established Transition Agreement, together with the evidence of implementation of the VKA model</p>			



Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		(see rationale for scoring issue c) all provide some evidence that the strategy is being implemented successfully. I.e. SG80 is met. The team agrees, however, that because of the delays in implementation of the initial Transition Agreement, clear evidence is lacking and SG100 is not met.			
2.4.1 - Habitats outcome	Negative effect of mussel collection by mussel dredge on protected habitat type H1110 (Sandbanks which are slightly covered by sea water all the time) within EU Habitats Directive (EC, 1992) and associated Bird and Habitat directive species.	<p>Reports show a status decline for this habitat type from moderately unfavorable (status report N2000 areas 1994, 2004, 2007, 2013) to very unfavorable (status report 2019) and the conservation target has not yet been achieved. Furthermore the Dutch habitats report directed to the EU stated that for the habitat type H1110 the threat and pressure called “Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats” is of high importance for the status of habitat type H1110 (factsheet, Dutch Habitats report august 2019).</p> <p>The main habitat in the Wadden Sea and Delta areas used by the mussel fishery is subtidal sand and mud. This area includes the vulnerable habitat type H1110. Since the PCR 2016 (p.16) reported that the main present weakness of this fishery is amongst others the uncertainty about the impacts of the mussel seed fishery upon the natural (bottom) habitat and the habitats status report of 2019 states that fisheries are a high pressure and threat for the habitat type status. Although not studied in relation to mussel seed fisheries, several studies demonstrate that ongoing bottom fisheries (e.g. bottom trawling) can result in a shift in benthic community composition (a.o. Tillin et al. 2006). Long living species, filter feeders and sessile species are more vulnerable to bottom fisheries and decline with increasing fishing frequency, while</p>	<p><a href="https://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/art17/envxuhrwa/NL_habitats_reports-20190819-.xml&amp;conv=589&amp;source=remote#1110">https://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/art17/envxuhrwa/NL_habitats_reports-20190819-.xml&amp;conv=589&amp;source=remote#1110</a></p> <p>Attachment 1 &amp; 2</p> <p>Tillin, H. M., J. G. Hiddink, S. Jennings &amp; M. J. Kaiser (2006). Chronic bottom trawling alters the functional composition of benthic invertebrate communities on a sea-basin scale. <i>Marine Ecology Progress Series</i> 318: 31-45</p> <p>Rijnsdorp, A.D., Bolam, S.G., Garcia, C., Hiddink, J.G., Hintzen, N.T., van Denderen, P.D., van Kooten, T., 2018. Estimating sensitivity of seabed habitats to disturbance by bottom trawling based on the longevity of benthic fauna. <i>Ecological applications</i> 28, 1302-1312.</p> <p>Rippen, A., E. van der Zee, N. Fieten, J. Latour &amp; E. Wymenga (2020). Review effecten natuurlijke bodemdynamiek en menselijke bodemberoering in de sublitorale Waddenzee. A&amp;W-rapport 19-304.</p> <p>Altenburg &amp; Wymenga ecologisch onderzoek, Feanwâlden</p>	Score reduction expected to 60-80, condition raised	Not accepted (no change)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		opportunistic species show an increase (Tillin et al. 2006; Rijnsdorp et al. 2018). Although mussel fisheries are less destructive than bottom trawling (Rippen et al. 2020), ongoing frequent mussel seed fisheries might prevent the community from recovery into its original state, especially in the stable areas, or at least prevent habitat improvement on the longer run in these areas. Therefore we argue for a score reduction.			
<b>CAB response to stakeholder input</b>		<p>Firstly, the mussel seed fishery specifically targets mussel beds at their various stages of development which are described in the N2000 profile for H1110 (N2000, 2014) and which have been described in this report. During the autumn seed fishery, the unstable beds (with spat less than 1 year old) are targeted following identification in the autumn surveys. During the spring seed fishery, the more stable beds are targeted. The habitat impact assessment was therefore carried out on that basis. In this context, mussel beds as biogenic structures were considered a characteristic of the structure and function of N2000 habitats H1110, H1140 and H1160, noting that only H1110 and H1160 are relevant to the seed fishery. The ACDR scoring was revised following site visit stakeholder meetings, with naturally occurring mussel beds in the Wadden Sea and Oosterschelde now considered as VMEs under 2.4. It is important to note here that their consideration as VMEs is not straightforward: owing to their relatively short longevity – see van Smaal et al. (2013) – and the fact that they are specifically targeted by the fishery, mussel beds would usually be considered as a commonly encountered habitat. However, acknowledging the dedicated protection measures in place – including through the Mussel Transition Agreement – as well as their structural and functional significance as biogenic reefs, the team agreed to consider them as VMEs on a precautionary basis. This is a decision specific to this fishery. The N2000 status report for 1110 provides a very high-level overview of trends, pressures and threats. It needs to be acknowledged that mussel beds are only a component of this habitat type, and mussel fisheries one of many identified pressures and threats which include a range of other fishery types including bottom trawl, recreational use, oil and gas extraction, marine pollution etc. None of the evidence presented here establishes a clear causal link between the mussel fishery and H1110 status. In contrast, there has been dedicated research into the short-term effects of the mussel seed fishery on development of stable mussel beds by van Smaal et al. (2013) under the PRODUS study. The salient points are included in the new rationale, but overall, the team concludes that there is evidence that the seed fishery is highly unlikely to reduce structure and function of subtidal mussel beds to a point where there would be serious or irreversible harm in the context of the MSC Standard.</p>			
2.5.1 - Ecosystem outcome	Effect of mussel culture on	Adding dense populations of suspended filterfeeders, including the associated physical structure to a system can have direct and indirect consequences for the ecosystem. A qualitative network modelling study by	Forget, N.L., Duplisea, D.E., Sardenne, F., McKindsey, C.W. (2020). Using qualitative network models to assess the influence of mussel culture	Scoring implication s unknown	Accepted (no score change - additional

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
	the ecosystem	Forget et al. (2020) researched the consequences of mussel culture on zooplankton communities and other filterfeeders. The results showed that the presence of suspended mussel culture negatively affected primary producers (phytoplankton), zooplankton and deposit-feeders by means of competition. Furthermore it had a positive effect on predators and scavengers in low-energy environments by means of providing a food source. The response of the community strongly depended on hydrodynamic conditions, while nutrient availability had a minor impact. These results imply that the expected stimulation of primary production caused by the presence of mussel culture, is insufficient to compensate for grazing pressure. Also zooplankton was reduced by reduction in their food source (phytoplankton) and direct consumption by the cultured mussels. The results highlight the relevance of carrying capacity studies.	on ecosystem dynamics. Ecological Modelling, 430: 109070.		evidence presented)
<b>CAB response to stakeholder input</b>		The potential effects of shellfish culture on the Wadden Sea and Oosterschelde ecosystems has been acknowledged, including in our report, and dedicated monitoring of carrying capacity is in place. Indicators for carrying capacity are regularly monitored by Wageningen Marine Research who determine trends based on the average meat yield per year in harvested mussels and the annual growth of cockles as determined from stock assessments. The Hogeschool Zeeland (HZ) has conducted measurements of chlorophyll-a as a measure of algal concentrations along several points in the Oosterschelde associated with shellfish culture (both oysters and mussels) for several years. None of these indices have so far pointed to any trend (including a reduction) in carrying capacity. A more comprehensive study on this topic was recently carried out by Jansen et al. (2019) based on 1990-2016 data for the Wadden Sea and Oosterschelde. The current data shows no indications of overgrazing, or that either the productivity of the areas or the available food for filter feeders have been negatively impacted (Jansen et al., 2019). All this provides evidence that these UoAs are highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.			
2.6.1. Translocation outcome		For the aquaculture in the Netherlands (including mussel culture) many relocations take place. Together with the transport of the cultured species itself, other	Wijsman, J. W. M. en A. C. Smaal (2006). Risk analysis of mussels transfer. Wageningen Imares, Rapport nummer: C044/06	Scoring implication s unknown	Not accepted

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		<p>organisms may also be moved. This can lead to undesirable effects, for example when this leads to the (further) spread of invasive alien species.</p> <p>The import of shellfish species to the Netherlands from various areas already takes place for several decennia. For the Dutch mussel and oyster culture, shellfish are transported from Ireland, Germany and Denmark (Wijsman &amp; Smaal 2006). Wijsman &amp; Smaal (2006) studied the role of mussel import from the Irish and Celtic Sea to the Eastern Scheldt on the introduction risk of alien species for the environment. The risk depends on several factors including the amount of mussels being transported, species composition that come with the transport and environmental factors. The chance of introduction depends on the species caught with the mussel fishery, the survival during transport, the habitat requirements and the environmental conditions in the Netherlands. The results of the study showed that out of the 22 species of the Irish / Celtic Sea that are not present in the Eastern Scheldt, about 14 have a chance to survive transport. Regarding the effect, several species could pose a real risk, though development of a risk management program was recommended. Hence, there is a risk of introducing invasive species which could do irreversible harm to the ecosystem, we as stakeholders believe that an PI score of 100 on this topic is only applicable when the risk is zero. We argue for score reduction of this PI.</p>			(no change)
<b>CAB response to stakeholder input</b>		<p>The risks of mussel translocations have been recognised and national and regional legislation has been implemented since 2012: a Nature licence is needed, and this can only be obtained through the steps as described in section 6.4.2. The Shellfish Import Monitoring Protocol (SIMP) prescribes a three-yearly SASI (Shellfish-dependent species inventory), i.e. a species inventory of samples taken in situ at the source fishery, combined with a 'Big Bag' species inventory (BB). The SIMP also contains a contingency plan if 'undesirable' species are found in the</p>			

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		BB inventory. Since the initial assessment, none of the species identified in the SASIs and BBs have been considered to be problematic for the Oosterschelde; this has been documented in the surveillance reports for this fishery.			
3.1.1 - Legal and/or customary framework	The management system is not capable of delivering sustainable fisheries in accordance with MSC Principles 1 & 2	As mentioned before, the goals of the transition-agreement (Mossel Covenant 2008) have not been met. Therefore we believe that the majority of the blue mussel fishing effort is still performed in an unsustainable manner. Considering the former mentioned arguments under PI 2.3.1, 2.3.2, 2.4.2. we strongly doubt that the current management system is capable of delivering sustainable fisheries in accordance with MSC Principles 1 & 2. The management system needs to provide for a number of measures that reduce the pressure on the ecosystem (e.g. reduction of seed mussel fishery, closure of fishing area, etc.) and aim at a sustainable fishery. In our opinion, the main measures of the system have not been implemented in a the agreed upon way and we therefore conclude that the management system falls short. Thus we argue for a score reduction of PI 3.1.1.	<a href="https://rijkwaddenzee.nl/wp-content/uploads/2019/07/Jaarverslag-Mosseltransitie-2018.pdf">https://rijkwaddenzee.nl/wp-content/uploads/2019/07/Jaarverslag-Mosseltransitie-2018.pdf</a>	Score reduction expected to 60-80, condition raised	Not accepted (no change)
<b>CAB response to stakeholder input</b>		The management of the fishery consists of more than the mussel agreement, though it outlines an important fishery-specific management strategy. The Dutch Fishery Law (visserijwet) and accompanying legislation (e.g. Reglement zee- en kustvisserij) contain the larger legal framework, and contain stipulations that nature conservation could be a determining factor in setting Ministerial rules. The Fishing licence for the mussel fishery is tied to the Natura 2000-licence, which serves to guarantee that the mussel fishery does not have any significant negative effects on the Natura 2000-goals (both for habitat and protected species). Therefore, the management system for this fishery ensures that management outcomes are consistent with MSC Principles 1 and 2 (NB: Principle 1 is not scored for the UoAs dealing with the seed fishery and culture plots, so the focus of the assessment is on ensuring outcomes consistent with Principle 2).			
3.2.3 - Compliance and enforcement	Monitoring, control and surveillance mechanisms do not	The most important fishery's management measures (e.g. reduction of seed mussel fishery, closure of fishing area) have not been implemented in the way that was agreed upon. We believe it is highly remarkable that this mis compliance of the management system has no	Score reduction expected to 60-80, condition raised	80	Not accepted (no change)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
	ensure that the fishery’s management measures are complied with.	effect on the fishing industry or the MSC PI scores. Not complying with the agreement did not result in penalties or other consequences for the mussel fishery. For this reason we believe that the monitoring, control and surveillance mechanisms of the management plan is not working properly and this should be reevaluated. We plead for a strict control on the agreed upon transition-agreement which should be incorporated in the MSC assessment system and on top of that raising conditions for PI 3.2.3.			
CAB response to stakeholder input		It is our understanding that the mussel agreement up until December 2020 was a voluntary agreement between the Producer Organisation (PO), eNGOs and the Ministry of LNV, outlining preferred measures related to closure of areas for the fishery, and establishing a framework for further policy (e.g. with regards to the availability of areal for MZIs). The intentions as outlined in the Agreement are not set in law or regulations, until the proces around the Agreement makes way for the next step in the measures taken. As such, the intentions are not enforceable through a formal MCS system, and remain subject to discussions between the partners in the agreement. We believe that the measures that have been implemented (e.g. the closure of areas) and have become part of e.g. PO regulations and also Nature conservation licences, are enforced through e.g. black box monitoring and the control authorities, and adhered to. We therefore see no reason to rescore this issue, as there appears to be no lack of enforcement and control, nor of compliance with the applicable rules. It is worth noting that the new Agreement (December 2020) does contain wording on to deal with further delays in closures, including the appointing of a 3-person committee to advise on further steps and the ultimate step taking the Agreement partners to court.			
General comments					
VMEs Habitat types under EC Habitats Directive should be considered as VME  The reassessment report states on page 39 “Blue mussel beds in The Netherlands are not protected and were therefore not considered as VMEs”. We believe this is an incorrect interpretation of legislation. Mussel beds in various stages of development are characteristic of habit type H1110A and have important ecological functions within this subtype (profieldocument LNV). Due to this function of mussels within H1110 blue mussel beds are protected under the Habitat Directive. The improvement of area and structure of mussel beds is a specific target of the Wadden Sea Natura-2000 management plan and this is in			<a href="https://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/art17/envxuhrwa/NL_habitats_reports-20190819-.xml&amp;conv=589&amp;source=remote">https://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/art17/envxuhrwa/NL_habitats_reports-20190819-.xml&amp;conv=589&amp;source=remote</a>  <a href="https://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/art17/envxuhrwa/NL_habitats_reports-20190819-.xml&amp;conv=589&amp;source=remote#1110">https://cdr.eionet.europa.eu/Converters/run_conversion?file=nl/eu/art17/envxuhrwa/NL_habitats_reports-20190819-.xml&amp;conv=589&amp;source=remote#1110</a>  Attachment 1 & 2	N/a	Accepted (no score change - additional evidence presented)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		<p>conflict with marine shellfish harvesting. Some pages further in Reassessment document of 2020 (page 74) speaks of “ 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.” We firmly disagree with this conclusion mainly because national habitats status reports, directed to the EU, clearly point out that Marine fish and shellfish harvesting (professional &amp; recreational) cause physical loss and disturbance of the seafloor habitats and are ranked as high importance of impact and serious threats for H1110 (factsheet, Dutch Habitats report august 2019). The conservation goals (instandhoudingsdoelen) for H1110 have not been reached and future prospects of both parameters structure and function are both categorized as ‘bad’. As long as the conservation goals for the habitat type are not met and we have to be pessimistic about future prospects of the status of this habitat, we believe that all activities which cause harm should be restricted.</p> <p>Furthermore the reassessment report concludes in section 6.4.6 that the habitat type 1110 under the EC Habitat Directive is not considered as a VME in this assessment. The Wadden Sea has been designated by the International Maritime Organization as particularly sensitive sea area (<a href="https://www.waddenzee.nl/fileadmin/content/Dossiers/Overheid/pdf/PSSA-application.pdf">https://www.waddenzee.nl/fileadmin/content/Dossiers/Overheid/pdf/PSSA-application.pdf</a>). To the best of our knowledge, a PSSA is considered as a VME. Besides in our opinion all Natura 2000 areas within the marine realm, should be considered as VMEs because of their importance for local and worldwide biodiversity. Since the UoAs overlap with habitat type H1110 and fish within the VME Wadden Sea, all PIs dealing with VMEs should be reassessed and rescored.</p>	<p>profiel document LNV  <a href="https://www.natura2000.nl/sites/default/files/profielen/Habitattypen_profielen/Profiel_habitattypen_1110_2014.pdf">https://www.natura2000.nl/sites/default/files/profielen/Habitattypen_profielen/Profiel_habitattypen_1110_2014.pdf</a></p> <p><a href="https://www.waddenzee.nl/fileadmin/content/Dossiers/Overheid/pdf/PSSA-application.pdf">https://www.waddenzee.nl/fileadmin/content/Dossiers/Overheid/pdf/PSSA-application.pdf</a></p>		
<b>CAB response to stakeholder input</b>		Please see our responses in relation to the Habitats PIs. Wild mussel beds are now considered as VMEs and these PIs have been rescored.			
	Importance of mussel beds in fighting climate change	Accelerating sea level rise (as a consequence of global climate change) may have major consequences for the Wadden sea. When the relative sea level rise rises above net sedimentation, large-scale drowning will occur. Large areas of ecologically important mud flats and salt marshes will be lost. The drowning is also accompanied by risks for coastal	<p>Borsje, B.W., B.K. van Wesenbeeck, F. Dekker, P. Paalvast, T.J. Bouma, M.M. van Katwijk, M.B. de Vries (2011). How ecological engineering can serve in coastal protection. Ecological Engineering doi:10.1016/j.ecoleng.2010.11.027</p> <p>Fey, F., A. Rippen, N. Dankers &amp; C. Smit (2012). Growing with sea level rise - Deltaprogram</p>	N/a	Not accepted (no change)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		<p>protection. It is uncertain to what extent sedimentation can compensate the relative sea level rise (Schuttenhelm 2017).</p> <p>Mussel beds are ecosystem engineering species and that have the ability to modify the local physical environment by their structure and/or activity (Borsje et al. 2011). Mussels are important bio-stabilizers, by capturing small particles from the water column (both food particles and fine sediment) and producing biodeposits (faeces and pseudofaeces) in and around the mussel bed (Fey et al. 2011). In this way the sediment composition underneath the mussel bed is changed, and by the structure of the mussel bed and the mucus layer surrounding silt particles, the fine sediment will be kept in place. Through the rough mussel bed surface and reduced wave action above the bed, also other fine grained material is trapped and passively settles down to the bed.</p> <p>By the ability of trapping and capturing, mussel beds can accumulate large amounts of sediment (biodeposition), which are 40-times the natural sedimentation rate (Widdows et al. 1998). Due to this the sediment gets elevated: vertical growth occurs. As a result the mussel beds form conspicuous structures that can influence tidal flow and wave action and, in doing so, modify patterns of sediment deposition, consolidation, and stabilization. In this way, ecosystem engineering species can be used in coastal protection in attenuating waves (in foreland protection minimizing forces on dikes) and growing with sea level rise (Borsje et al. 2011; Morris et al. 2019). In this way mussel beds provide flood protection in Wadden Sea and function as a natural coastal defence system. Hence, mussel beds are of high importance in our current and future fight against climate change and sea level rise. The destructive practise of mussel dredging impairs this important mussel function. We believe that this long-term advantage of healthy mussel beds for our future flood protection should be incorporated with the correct appreciation into your fishery assessment.</p>	<p>Wadden Progress Report inventory mussel beds 2011: Cluster 3 Sediment. IMARES Wageningen UR Report number C025/12:</p> <p>Morris, R. &amp; Bilkovic, D.M., Boswell, M., Bushek, D. , Cebrian, J., Goff, J. , Kibler, K., La Peyre, M. McClenachan, G., Moody, J., Sacks, P., Shinn, J., Sparks, E., Temple, N., Walters, L., Webb, B. &amp; Swearer, S. (2019). The application of oyster reefs in shoreline protection: Are we over-engineering for an ecosystem engineer?. Journal of Applied Ecology. 56. 10.1111/1365-2664.13390.</p> <p>Schuttenhelm, R. (2017). De toekomst van de Waddenzee: een stijgende zeespiegel over een dalende bodem. Waddenvereniging rapport.</p> <p>Van Loon-Steensma, J.M. (2014). Salt marshes for flood protection. Long-term adaptation by combining functions in flood defence. Thesis Wageningen University.</p> <p>Widdows, J., M.D. Brinsley, P.N. Salkeld &amp; M. Elliott (1998). Use of annular flume to determine the influence of current velocity and bivalves on material flux at the sediment-water interface. Estuaries 21(4A): 552-559</p>		
<b>CAB response to stakeholder input</b>		<p>The impact of the seed fishery (the more problematic UoA in relation to this habitat type) on mussel bed structure, functioning and development has been assessed under the habitats component. Please see our rationale under 2.4.1 in particular. The impact assessment of the seed fishery on this habitat type is in keeping with MSC procedure. No additional considerations, e.g. with regard to climate change, are required. Although the response code says 'not accepted.', this does not mean the team disagrees with this statement. We believe there is evidence that the seed fishery is highly unlikely to reduce structure and function of subtidal mussel beds to a point where there would be serious or irreversible harm. By extension, we believe that the role of mussel beds in mitigating climate change should therefore also not</p>			



Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response code
		be negatively impacted by the seed fishery; however there is no requirement to explicitly consider this in the MSC Standard and this is therefore not done.			

To be completed at Public Certification Report

## 8.5 Surveillance

To be drafted from Client and Peer Review Draft Report

**Table 20. Fishery surveillance program**

Surveillance level	Year 1	Year 2	Year 3	Year 4
4	Off-site surveillance audit	On-site surveillance audit	Off-site surveillance audit	On-site surveillance audit & re-certification site visit

**Table 21. Timing of surveillance audit**

Year	Anniversary date of Certificate	Proposed date of surveillance audit	Rationale
1	October 2022	October 2022	N/A as it is proposed that the first surveillance is conducted on the certificate anniversary date.

**Table 22. Surveillance level rationale**

Year	Surveillance activity	Number of Auditors	Rationale
1	Off-site audit	1 auditor off-site	<p>The assessment team have determined that the surveillance level for this fishery can be reduced from the default of 6 down to level 4. (i.e. 2 on-site surveillance audits and 2 off-site surveillance audits) based on the following rationale:</p> <ul style="list-style-type: none"> <li>The default assessment tree for enhanced bivalves (with the only the genetics component of P1 scored for UoA 5) was used during this assessment</li> <li>There are no Conditions on Outcome PIs resulting from the reassessment</li> <li>All Principal Level Scores are above 80</li> </ul>

## 8.6 Harmonised fishery assessments

A review of other MSC overlapping fisheries was conducted. Though there are other mussel fisheries certified and in assessment in the Wadden Sea (Table 23), harmonisation was not needed, since Principle 1 was not scored for this fishery, nor appropriate due to differences between the fisheries in terms of e.g. regulatory requirements, differences in gears etc. The only other Dutch shellfish fishery in the MSC programme is the OHV Dutch Waddenzee and Oosterschelde Hand Raked cockle fishery, which does not overlap with this habitat type (and harmonisation would not be required anyway as it was assessed against the previous standard version (1.3)). The fisheries listed in Table 23 have been used for comparison, as they are the mussel fisheries closest to the one under re-assessment.

**Table 23. Wadden Sea mussel fisheries in the MSC programme which may overlap with this fishery.**

Fishery name	MSC Requirements assessed under	Overlapping element
Schleswig-Holstein mussel fishery	v2.0	Parts of P2 (same ecosystem, similar gear, same European legislation applicable but different fishery-specific regulations)
Lower Saxony Mussel Dredge and Mussel Culture Fishery	v1.3 (version 2.0 process)	Parts of P2 (same ecosystem, similar gear, same European legislation applicable but different fishery-specific regulations)

## 8.7 Objection Procedure

To be added at Public Certification Report stage