

**Marine Stewardship Council Full Re-Assessment
Final Report and Determination**

For The

Northern Ireland Bottom Grown Mussel Fishery

And The Linked

Ireland Bottom Grown Mussel Fishery

Facilitated By

Aquaculture Initiative EEIG

And The

Bord Iascaigh Mhara (BIM)

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Foreword

The MSC Fisheries Standard sets out requirements that a fishery must meet to enable it to claim that its fish come from a well-managed and sustainable source. The standard applies to wild-capture fisheries that meet the scope requirements. The MSC Fisheries Standard comprises three core principles:

Principle 1: Sustainable target fish stocks

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

Principle 2: Environmental impact of fishing

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

Principle 3: Effective management

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

A full description of the MSC Fisheries Certification Requirements and Processes followed during this re-assessment can be found in MSC Fisheries Certification Requirements and Guidance. This re-assessment uses the version of the MSC Standard outlined in the MSC Certification Requirements (CR) v1.3 published on January 14th 2013 but follows the processes outlined in the MSC Fisheries Certification Requirements (FCR) v2.0 re-released on 1st October, 2015, the definitive version of all documents are maintained on the MSC's website www.msc.org. Any discrepancy between copies, versions or translations shall be resolved by reference to the definitive English version.

Readers should verify that they are using the copy of the MSC CR/FCR (and other documents) that are relevant to this re-assessment. Updated documents, together with a master list of all available MSC documents, can be found on the MSC's website.

Glossary

AA	Appropriate Assessment
AFBI	Agri Food and Biosciences Unit
BG	Bottom Grown
BGMCF	Bottom Grown Mussel Consultative Forum
BGMSRG	Bottom Grown Mussel Sector Review Group
BIM	Bord Iascaigh Mhara – Irish Sea Fisheries Board
CAB	Conformity Assessment Body - Certifier
CAG	Catch and Grow
CBAIT	Cross Border Aquaculture Initiative
CLAMS	Coordinated Local Aquaculture Management Systems
C-Mar	Centre for Marine Resources and Mariculture
COC	Certificate of Compliance
CPUE	Catch per Unit Effort
DAERA	Department of Agriculture and Rural Development (formerly Department of Agriculture, Environment and Rural Affairs (DARD))
DAFM	Department of Agriculture Food and the Marine
DARD	Department of Agriculture and Rural Development
ECOPACT	Environmental Code of Practice for Aquaculture Companies and Traders
EEIG	European Economic Interest Grouping (formerly Cross Border Aquaculture Initiative (CBAIT))
EEZ	Exclusive Economic Zone
EFF	European Fisheries Fund
ESRI	Economic and Social Research Institute
ETP	Endangered, Threatened and Protected species
EU	European Union
FAM	MSC's Fisheries Assessment Methodology
FAO	United Nations Food and Agriculture Organisation
FCILC	Foyle, Carlingford and Irish Lights Commission
FTE	Full Time Equivalents
HCRs	Harvest Control Rules
ICES	International Council for the Exploration of the Seas
ICZM	Integrated Coastal Zone Management
IFA	Irish Farmers Association
IIG	Interim Implementation Group
IQM	Irish Quality Mussels
LA	Loughs Agency
MCS	Monitoring, Control and Surveillance
MSC	Marine Stewardship Council
NDP	National Development Plan
NI	Northern Ireland
NPWS	National Parks and Wildlife Service
P1	MSC Principle 1
P2	MSC Principle 2
P3	MSC Principle 3
PI	Performance Indicator
PI	MSC Performance Indicator
PO	Producer Organisation
R&D	Research and Development
RBF	Risk Based Framework
IE	Republic of Ireland

SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SFPA	Sea-Fisheries Protection Authority
SG	Scoring Guidepost
SMILE	Sustainable Mariculture in Northern Irish Lough Ecosystem
SPA	Special Protection Area
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAC	Total Allowable Catch
UISCE	Understanding Irish Shellfish Culture Environments
VMS	Vessel Monitoring System

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1. Executive Summary

This report sets out the details of the 1st MSC re-assessment of the Northern Ireland Bottom Grown Mussel Fishery against the MSC Principles and Criteria for Sustainable Fisheries. The report details the background, results and justification of the assessment of the fishery performed by SAI Global.

The full re-assessment process began on 14th September, 2017 when the re-assessment was officially announced on the MSC website.

SAI Global's assessment team included:

- Sam Dignan (Lead Assessor and expert on Principle 1, Traceability and RBF)
- Deirdre Hoare (Assessor and expert on Principle 2)
- Conor Donnelly (Assessor and expert on Principle 2)
- Fergal Guilfoyle (Assessor and expert on Principle 3)

Short biographies are provided in [Section 2.1](#).

The fishery under assessment is defined by the Unit of Assessment (UoA) and proposed Unit of Certification (UoC) as outlined in [3.1.1.3. Description of the UoA](#) and [3.1.1.4. Description of proposed UoC and other eligible fishers](#).

In accordance with FCR 7.8.3.3 and FCR 7.4.12.2 the client prepared and published a statement of their understanding and willingness for reasonable certificate sharing arrangements (see Appendix 3) and has informed other eligible fishers of the above to the extent practicable.

This re-assessment assessed the applicant fishery against the Certification Requirements outlined in MSC Certification Requirements (CR) v1.3 (14th January 2013), according to the current version of MSC procedures outlined in MSC Fishery Certification Requirements (FCR) v2.0 (1st October 2014), and implemented by SAI Global's accredited MSC Procedures (QP) using the MSC scheme documents outlined in Table 12.

Initial consultation meetings were held in late-November 2017; Table 13 details the dates, meeting locations and organisations that were consulted through direct meetings during the on-site assessment. Following the on-site meeting the Assessment Team evaluated the evidence and scored the fishery against the relevant Certification Requirements.

The Assessment Team have found the main strengths of this fishery to be the level of cooperation and co-management between agencies and across jurisdictions, the long times series of seed mussel surveys and the abundance of ecosystem information available for most on-growing areas while the main weaknesses were found to be the Client's continuing inability to convince stakeholders that the seed mussel beds exploited by the fishery are indeed ephemeral and the fact that Appropriate Assessments have not been completed for all current ongoing areas.

This re-assessment report has been externally reviewed through the MSC's Peer Review College and the Assessment Team have responded to any issues raised by the Peer Reviewers.

At this point of the re-assessment process the Assessment Team is recommending that, as the fishery achieved a score of 80 or higher on each of the three MSC Principles independently and did not score less than 80 against any Performance Indicator, continuing certification should be awarded. Score achieved in each Principle and for each Performance Indicator are shown in Table 18 and Table 19, respectively.

As the fishery scored at least 80 against all relevant PIs, it is not proposed that any binding conditions be attached to the continuing certification of this fishery. Note the Assessment Team have made two non-binding Recommendations the details of which can be seen in [6.4. Summary of Recommendations](#).

The report will now be available for a period of 30 days in which stakeholders are invited to comment on the on the factual contents of the report, either in relation to the specific sections of the report or specific scoring indicators.

2. Authorship and Peer Reviewers

2.1. Assessment Team

The assessment team was made up of:

- Sam Dignan (Assessment team lead and P1 assessor)
- Deirdre Hoare, (P2 Assessor)
- Conor Donnelly, (P2 Assessor)
- Fergal Guilfoyle, (P3 Assessor)

The Northern Ireland Bottom Grown Mussel Fishery was originally certified by SAI Global Assurance Services (latterly SAI Global) in July 2013 and all subsequent surveillance audits have all been conducted by SAI Global. This re-assessment of the fishery is also being undertaken by SAI Global.

There have been numerous changes to the assessment team since it was initially certified and none of the current team members were part of the original assessment team. However, Fergal Guilfoyle has been part of the team for the all four surveillance audits and Sam Dignan was part of the team for the 3rd surveillance audit and led the assessment team for the 4th surveillance audit.

When this re-assessment was originally announced on 14th September 2017, the assessment team was to be made up of Sam Dignan (as Team lead and P1 assessor), Deirdre Hoare (as P2 assessor) and Fergal Guilfoyle (as P3 assessor) but, having joined SAI Global in early-October, Conor Donnelly (as P2 assessor) was added as additional team member on 19th October 2017; this change to the assessment team was communicated to stakeholders at this time.

The skills and experience of the assessment team are summarised below.

Sam Dignan (Lead Assessor and Responsibilities on Principle 1)

Sam Dignan is a fisheries scientist who has previously worked with the Department of Environment, Food and Agriculture (DEFA), Isle of Man and Bangor University Fisheries and Conservation Science Group (Wales). He has a BSc in Biological and Chemical Sciences with Zoology from University College Cork and an MSc in Marine Environmental Protection from Bangor University. He has experience conducting stock assessments, from the survey design and implementation phases through to final analysis and report presentation; from 2013 to 2015 he was a member of the ICES working group on scallop stock assessment. He has been involved in providing scientific data to ensure fishery compliance with the Marine Stewardship Council's (MSC) certification framework and has participated in MSC surveillance audits from a client's perspective.

Sam has extensive experience interacting directly with fishers and their representative organisations as well as members of scientific and government institutions. He was previously an advisor to the Isle of Man Queen Scallop Management Board that manages the MSC certified Isle of Man queen scallop fishery. He has also worked on the spatial analysis of fishing activity, using Vessel Monitoring System (VMS) and logbook data, to spatially quantify fishing activity and fisheries-ecosystem interactions. Sam is an ISO approved lead auditor.

Deirdre Hoare (Assessor, Responsibilities in P2)

Deirdre Hoare is an independent fisheries consultant with more than 10 years of experience working in a wide range of projects associated with marine biodiversity and the sustainable use of living aquatic resources. Her principal area of expertise is in relation to stock assessment and ecosystem impacts of both artisanal and commercial fisheries. Her work currently involves evaluation and verification of fisheries management and sustainability against international standards. She also performs fish stock assessments, evaluates data and outlines the limitations.

Deirdre previously worked as a Fisheries Assessment Analyst and as a Scientific and Technical Officer for the Marine Institute in Ireland. This work involved fisheries research and stock assessment for ICES working groups. The work also involved coordination and management of a Fisher Self sampling program in the Irish Sea, with particular emphasis on spatial and temporal discard measurement tools. As well as having worked as a researcher, she completed many trips on commercial fishing vessels in the capacity of scientific observer in the NAFO area, North West Atlantic and Irish Coast. She has also experience on finfish and shellfish aquaculture that she gained working in Scotland. She also works as an assessor for SAI Global in FAO Responsible Fisheries Management and Marine Stewardship Council assessments in both Iceland, Alaska and Ireland.

Conor Donnelly (Assessor, Responsibilities in P2)

Conor is an MSC approved Fisheries Team Leader for SAI Global. He is an experienced marine ecologist and environmental manager with a background of over 17 years at the UK's statutory nature conservation body, Natural England, where he was Senior Marine Adviser responsible for marine delivery across the East Midlands, Norfolk and Suffolk. Conor has particular experience of shellfisheries and their management, Marine Protected Areas including their designation, conservation advice and monitoring, conservation legislation and policy and working with partners and stakeholders to deliver positive environmental outcomes.

Fergal Guilfoyle (Assessor, Responsibilities in Principle 3)

Fergal has a degree in Marine Biology from Trinity College Dublin, a Masters in Fisheries and Marine Science from Aberdeen University and a postgraduate Diploma in Environmental Management from the University of Ulster. Fergal is currently managing director of Treanbeg Shellfish Ltd, a small oyster farming business based in Mayo. Treanbeg Shellfish also trades as Treanbeg Marine Consulting which is a business focusing on Environmental Impact Assessment for finfish farms. Fergal is a member of the Chartered Institute of Ecology and Environmental Management, and he is an invited member of the National Inland Fisheries Forum (NIFF) which advises IFI and the minister in matters relating to inland fisheries resources in Ireland. Fergal has worked as a research scientist in Ireland for BIM and the Marine Institute. As an Aquaculture Development/Quality Officer in Co. Mayo, Fergal has gained a thorough understanding of all aspects of the aquaculture industry in Ireland. Since 2009 Fergal has been working extensively with the Aquaculture Industry as a shellfish producer and as a consultant working on EIA projects in the finfish sector.

2.2. Peer Reviewers

The Peer Review of this fishery was conducted through the MSC's Peer Review College and was conducted by two of the following (Note Peer Reviewers are referred to as Peer Reviewer A and Peer Reviewer B in this report:

- Andrew Hough
- Terry Holt
- Jim Andrews
- Martin Van Brakel

With respect to these Peer Reviewers, a summary of their experience and qualifications is included in the Final PR shortlist announcement available on the MSC website at the following address:

<https://fisheries.msc.org/en/fisheries/northern-ireland-bottom-grown-mussel/@@view>

Further details of their experience are available on request by email to the Peer Review College:

PeerReviewCollege@msc.org

3. Description of the Fishery

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

3.1.1. UoA and Proposed Unit of Certification (UoC)

3.1.1.1. Statement that fishery is within scope of MSC certification

The fishery is eligible for certification and able to be assessed within the scope of the MSC Principles and Criteria for Sustainable Fishing (MSC FCR v2.0 7.4):

- The target species is not an amphibian, a reptile, a bird, or a marine mammal;
- Fishing operations are not conducted using destructive fishing practices such as poisons or explosives;
- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- There are mechanism to resolve possible disputes;
- The fishery does not include an entity that has been successfully prosecuted for violations against forced labour laws;
- The client is willing to share the certificate with fishers not part of the client group;
- There are no catches of non-target stocks (Principle 2) that are inseparable or practicably inseparable (IPI) from the target stock (Principle 1);
- The fishery is not based on an introduced species, blue mussel being a native species of Ireland; and
- This re-assessment of Northern Ireland bottom grown mussel overlaps with the concurrent re-assessment of Ireland bottom grown mussel and the 2nd surveillance audit of North Menai Strait mussel.

Additional scope requirements for enhanced fisheries

The fisheries under assessment represent Catch and Grow (CAG) fisheries so any additional scope criteria that apply to Hatch and Catch (HAC) systems are not applicable. In addition to the general scope requirements outlined above, the fishery is within the scope criteria for enhanced fisheries namely:

A. Linkages to and maintenance of a wild stock

- i. At some point in the production process, the system relies upon the capture of fish from the wild environment.
- ii. The species are native to the geographic region of the fishery and the natural production areas from which the fishery's catch originates.
- 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.

B. Feeding and Husbandry

- i. The production system operates without substantial augmentation of food supply. In catch-and-grow (CAG) systems, feeding during the captive phase is only by natural means (e.g., filter feeding in mussels), or at a level and duration that provide only for the maintenance of condition (e.g., crustacean in holding tanks) rather than to achieve growth.
- ii. In CAG systems, production during the captive phase does not routinely require disease prevention involving chemicals or compounds with medicinal prophylactic properties.

C. Habitat and ecosystem impacts

- i. Any modifications to the habitat of the stock are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure and function.

3.1.1.2. Rationale for choosing the UoA

The MSC Guidance for the Fisheries Certification Requirements defines the Unit of Certification (UoC) and the Unit of Assessment (UoA) in G7.4.7 – G7.4.9. The UoC (i.e., the unit entitled to receive an MSC certification) is defined as follows:

“The target stock or stocks (=biologically distinct unit/s) combined with the fishing method/gear and practices (including vessel type/s) pursuing that stock and any fleets, groups of vessels, or individual vessels of other fishing operators.”

The UoA defines the full scope of what is being assessed and is therefore equal to or larger than the UoC. If it is larger, it means it will include other eligible fishers. Other eligible fishers are fishers who are not member of the client group and fish for the target species using the same fishing gear under the same management system. Accordingly, the UoA and UoC for the Northern Ireland bottom grown mussel fishery are defined as in Table 1 and Table 2.

3.1.1.3. Description of the UoA

Table 1. Unit of Assessment for the Northern Ireland bottom grown mussel fishery.

UoA									
Species	Blue mussel (<i>Mytilus edulis</i>)								
Geographical Area	All fishing activity takes place within FAO Major Fishing Area 27 Northeast Atlantic (ICES Areas VIa, VIIa, VIIg, VIIj and VIIb) and is split between seed and harvest locations. <table border="0" style="width: 100%; margin-top: 10px;"> <tr> <td style="width: 20%;">Seed location</td> <td>Coastal waters of Northern Ireland and the Republic of Ireland within their respective 12 nautical mile Territorial Seas.</td> </tr> <tr> <td>Harvest locations</td> <td>Permitted harvest areas in identified bays of the Republic of Ireland and Northern Ireland coastal waters including:</td> </tr> <tr> <td>Northern Ireland</td> <td>Belfast Lough Lough Foyle Carlingford Lough (NI portion)</td> </tr> <tr> <td>Republic of Ireland</td> <td>Lough Swilly Castlemaine (Cromane) Wexford harbour Lough Foyle Carlingford Lough (IE portion)</td> </tr> </table>	Seed location	Coastal waters of Northern Ireland and the Republic of Ireland within their respective 12 nautical mile Territorial Seas.	Harvest locations	Permitted harvest areas in identified bays of the Republic of Ireland and Northern Ireland coastal waters including:	Northern Ireland	Belfast Lough Lough Foyle Carlingford Lough (NI portion)	Republic of Ireland	Lough Swilly Castlemaine (Cromane) Wexford harbour Lough Foyle Carlingford Lough (IE portion)
Seed location	Coastal waters of Northern Ireland and the Republic of Ireland within their respective 12 nautical mile Territorial Seas.								
Harvest locations	Permitted harvest areas in identified bays of the Republic of Ireland and Northern Ireland coastal waters including:								
Northern Ireland	Belfast Lough Lough Foyle Carlingford Lough (NI portion)								
Republic of Ireland	Lough Swilly Castlemaine (Cromane) Wexford harbour Lough Foyle Carlingford Lough (IE portion)								
Stock	Blue mussels around the island of Ireland.								
Method of capture	Modified Dutch Bottom Dredge*								
Management system	<table border="0" style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 20%;">Northern Ireland</td> <td>Department of Agriculture, Environment and Rural Affairs (DAERA)</td> </tr> <tr> <td>Republic of Ireland</td> <td>Department of Agriculture Food and Marine (DAFM) and the Sea Fisheries Protection Agency (SFPA)</td> </tr> </table>	Northern Ireland	Department of Agriculture, Environment and Rural Affairs (DAERA)	Republic of Ireland	Department of Agriculture Food and Marine (DAFM) and the Sea Fisheries Protection Agency (SFPA)				
Northern Ireland	Department of Agriculture, Environment and Rural Affairs (DAERA)								
Republic of Ireland	Department of Agriculture Food and Marine (DAFM) and the Sea Fisheries Protection Agency (SFPA)								
Client Group and other eligible fishers	<p>The Aquaculture Initiative EEIG and Bord Iascaigh Mhara (BIM) representing all members of the bottom mussel industry on the island of Ireland.</p> <p>All members of the Bottom Grown Mussel Industry, eligible to fish in the relevant jurisdiction, will be eligible to access the certificate; however, only those entities that have contributed financially to the MSC process will be considered to be part of the client group for the purpose of Certification. The most up to date client group will be available on the MSC website this will be updated when any changes have occurred.</p> <p>There are currently no other eligible fishers. Potential other eligible fishers would be any fishers, eligible to fish in Republic of Ireland waters, not on the most up to date client group list.</p>								

* Hand raking was removed as an eligible gear following a Variation Request that was accepted on 04/05/2018.

There are other eligible fishers who are not members of the client group and who fish for the target species using the same fishing gear under the same management system(s). These other eligible fishers include all professional fishermen on the island of Ireland entitled to fish blue mussels with bottom dredges or by hand raking who are not part of the client group.

In accordance with FCR 7.8.3.3 and FCR 7.4.12.2 the client has prepared and published a statement of their understanding and willingness for reasonable certificate sharing arrangements (see Appendix 3) and has informed other eligible fishers of the above to the extent practicable.

3.1.1.4. Description of proposed UoC and other eligible fishers

Table 2. Proposed Unit of Certification for the Northern Ireland bottom grown mussel fishery.

UoC	
Species	Blue mussel (<i>Mytilus edulis</i>)
Geographical Area	<p>All fishing activity takes place within FAO Major Fishing Area 27 Northeast Atlantic (ICES Areas VIa, VIIa, VIIg, VIIj and VIIb) and is split between seed and harvest locations.</p> <p>Seed location Coastal waters of Northern Ireland and the Republic of Ireland within their respective 12 nautical mile Territorial Seas.</p> <p>Harvest locations Permitted harvest areas in identified bays of the Republic of Ireland and Northern Ireland coastal waters including:</p> <p>Northern Ireland Belfast Lough Lough Foyle Carlingford Lough (NI portion)</p> <p>Republic of Ireland Lough Swilly Castlemaine (Cromane) Wexford harbour Lough Foyle Carlingford Lough (IE portion)</p>
Stock	Blue mussels around the island of Ireland.
Method of capture	Modified Dutch Bottom Dredge*
Management system	<p>Northern Ireland Department of Agriculture, Environment and Rural Affairs (DAERA)</p> <p>Republic of Ireland Department of Agriculture Food and Marine (DAFM) and the Sea Fisheries Protection Agency (SFPA)</p>
Client Group	<p>The Aquaculture Initiative EEIG and Bord Iascaigh Mhara (BIM) representing all members of the bottom mussel industry on the island of Ireland.</p> <p>All members of the Bottom Grown Mussel Industry, eligible to fish in the relevant jurisdiction, will be eligible to access the certificate; however, only those entities that have contributed financially to the MSC process will be considered to be part of the client group for the purpose of Certification. The most up to date client group will be available on the MSC website and will be updated where any changes have occurred.</p>

* Hand raking was removed as an eligible gear following a Variation Request that was accepted on 04/05/2018.

3.1.2. Final UoC(s) (PCR ONLY)

The PCR shall describe:

- a. The UoC(s) at the time of certification.
- b. A rationale for any changes to the proposed UoC(s) in section 3.1(c).
- c. Description of final other eligible fishers at the time of certification.
(References: FCR 7.4.8-7.4.10)

3.1.3. Total Allowable Catch (TAC) and Catch Data

During the year 2016, the total net tonnages of seed fished in Irish and Northern Irish waters were 7,536 t and 1,961 t respectively. Table 3 details the Republic of Ireland and Northern Ireland catches of seed mussels and their subsequent re-laying locations in 2016. A total of 6,002t t of finished mussels (end product) were produced by members of the client group in 2016.

Table 3. Gross and net tonnages of mussel seed fished and re-laid by Irish and Northern Irish and boats in 2016 (Fished and re-laid rows relate to where seed was fished and re-laid).

Fished	NI		IE		IE		NI		NI		IE		Total	
	Re-laid		NI		IE		NI		Foyle		Foyle			
Vessel	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net	Gross	Net
Irish	683	579	5,526	4,511	1,645	1,310	104	73	280	208	1,095	855	9,333	7,536
Northern Irish	225	177	1,675	1,345	170	170	262	203	102	66	0	0	2,434	1,961
Total	908	756	7,201	5,856	1,815	1,480	366	275	382	274	1,095	855	11,767	9,496

Table 4. TAC and Catch Data.

TAC	Year	n/a	Amount	n/a
UoA share of TAC	Year	n/a	Amount	n/a
UoC share of total TAC	Year	n/a	Amount	n/a
Total green weight catch by UoC	Year (most recent)	2016	Amount	7,536 t (seed)
				6,002 t (end product)
	Year (second most recent)	2015	Amount	

In 2016/2017 the only other significant fishery for mussel seeds in the Irish Sea resulted in approx. 4,200 tonnes being taken from Morecambe Bay in the eastern Irish Sea. In the same season the MSC certified North Menai Strait mussel fishery resulted in 4,940 tonnes of finished mussels being produced.

3.1.4. Scope of Assessment in Relation to Enhanced Fisheries

The fisheries under assessment represent enhanced Catch and Grow (CAG) fisheries whereby individuals are caught in the wild and ongrown to the desired size. The MSC FCR contains additional requirements for enhanced CAG fisheries. The specific circumstances of the fisheries under assessment as they relate to these additional requires is outlined below. For a statement describing how the fishery meets the scope criteria for enhanced fisheries see [3.1.1.1. Statement that fishery is within scope of MSC certification](#).

A. Linkages to and maintenance of a wild stock

i. *At some point in the production process, the system relies upon the capture of fish from the wild environment. Such fish may be taken at any stage of the life cycle including eggs, larvae, juveniles or adults. The 'wild environment' in this context includes marine, freshwater and any other aquatic ecosystems.*

The fisheries under assessment rely on the capture of seed (juvenile) mussels from the wild.

ii. *The species are native to the geographic region of the fishery and the natural production areas from which the fishery's catch originates.*

The target species (blue mussels (*Mytilus edulis*)) is native to the coastal areas around the island of Ireland in which the fisheries under assessment take place including both the initial catches of seed mussels and their subsequent ongrowing to marketable size.

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.*

There are natural reproductive components of the blue mussel stocks around the island of Ireland that maintain themselves without having to be restocked every year.

B. Feeding and Husbandry

- i. *The production system operates without substantial augmentation of food supply. In catch-and-grow (CAG) systems, feeding during the captive phase is only by natural means (...).*

The Northern Ireland and Ireland bottom grown mussel fisheries operate without any augmentation of feed. Instead feeding during the captive phase is entirely by natural means (i.e. the natural filter feeding activity of mussels).

- ii. *In CAG systems, production during the captive phase does not routinely require disease prevention involving chemicals or compounds with medicinal prophylactic properties.*

The Northern Ireland and Ireland bottom grown mussel fisheries operate without the use of any disease prevention involving chemicals or compounds with medicinal prophylactic properties.

C. Habitat and ecosystem impacts

- i. *Any modifications to the habitat of the stock are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure and function.*

There is no use of habitat modifications in the Northern Ireland and Ireland bottom grown mussel fisheries.

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

Not Applicable. Neither the Northern Ireland nor the Ireland bottom grown mussel fishery are Introduced Species Based Fisheries (ISBFs).

3.2. Overview of the fishery

3.2.1. Population structure of mussel populations around the island of Ireland

Three species of mussel, all in the genus *Mytilus* at present in Europe: *Mytilus edulis* (blue mussel), *M. galloprovincialis* (Mediterranean mussel) and *M. trossulus* (Baltic mussel) (Gosling, 1992; Koehn, 1991; Beaumont et al., 2008). While there are no significant fishery or aquaculture activities involving *M. trossulus* there is extensive mariculture of *M. edulis* and *M. galloprovincialis* throughout their distribution (Beaumont et al., 2008). There remains debate about the true taxonomic status of these “species” because where they overlap they can hybridise and produce fertile hybrids (Beaumont et al., 2008).

Where they overlap identification of *M. edulis* and *M. galloprovincialis* (and any hybrids) based on shell shape is usually uncertain because of the extreme plasticity of shape exhibited by mussels under environmental variation (Beaumont et al., 2008) but numerous genetic studies have used various methods to distinguish between the two “species” (e.g. Gosling and Wilkins, 1981; Koehn, 1991; McDonald et al., 1991; Gosling, 1992; Inoue et al., 1995; Wood et al., 2003; Gosling et al., 2008; Fly et al., 2015).

The main conclusions from population genetic studies to date have indicated that whereas, *M. galloprovincialis* is genetically subdivided into a Mediterranean group and an Atlantic group, *M. edulis* is genetically homogeneous throughout its range (Quesada et al., 1995). The hybrid zone in turn is large, ranging from western France to the north of Scotland, and is spatially complex, containing a mixture of pure, hybrid and introgressed individuals (Gosling et al., 2008) (Figure 1).

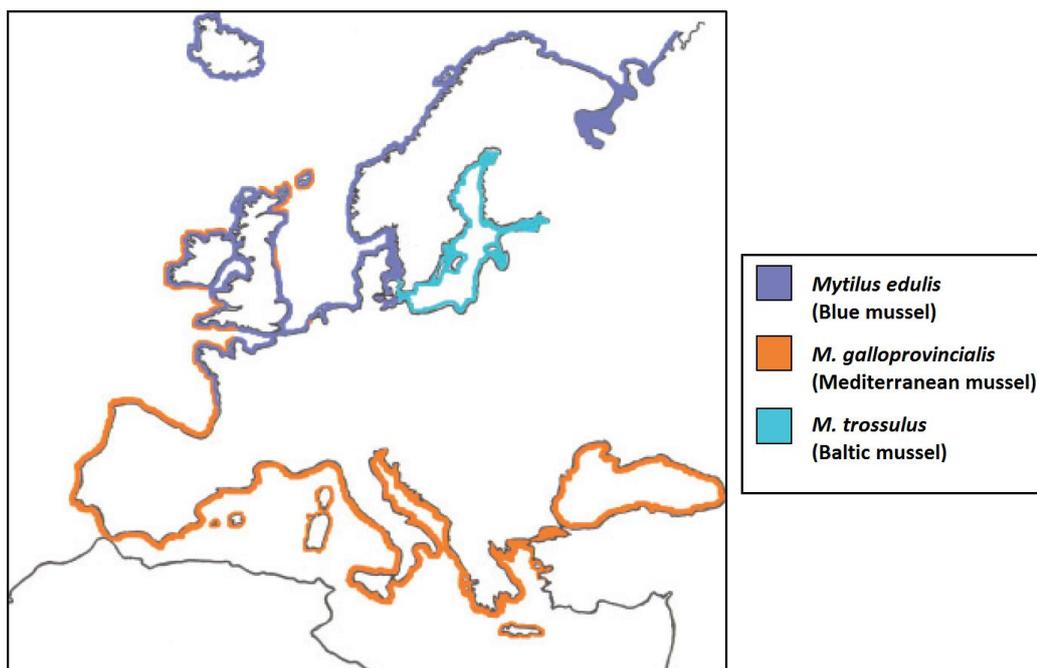


Figure 1. Approximate distributions of *M. edulis*, *M. galloprovincialis*, and *M. trossulus* in Europe (Source: modified from Gosling, 1992).

Studies have suggested that both the southward and northward extent of *M. edulis* and *M. galloprovincialis* respectively are determined by water temperature. Summer water temperatures are thought to determine the southern boundary of *M. edulis* with their being able to tolerate max. water temperatures of approx. 23°C (as opposed to approx. 30°C for *M. galloprovincialis*) while winter water temperatures determine the northward extent of *M. galloprovincialis* with their not being found in areas where winter water temperatures fall below approx. 9 – 10°C (Hilbish et al., 2012; Fly et al., 2015). As a consequence of generally rising water temperatures in the NW Atlantic it is thought that the spatial extent of *M. edulis* and *M. galloprovincialis* is shifting, and indeed will continue to shift, northwards (Fly et al., 2012; Fly et al., 2015).

Mussel culture in Europe relies on natural spatfall and employs three main methods of ongrowing spat to market size: bottom cultivation (as in this fishery), bouchot culture and suspended rope culture (Spencer *et al.*, 2002). With each of the three culture methods placing mussels into different environmental situations and predator exposure, it is possible that there may be genotype-specific differential mortality during culture (Beaumont *et al.*, 2008). Further evidence in support of this assertion is that partial ecological segregation is thought to account for most of the small-scale genetic patchiness within the hybrid zone (Gosling & Wilkins, 1981; Skibinski *et al.*, 1983, Bierne *et al.*, 2002; Hilbish *et al.*, 2003; Gosling *et al.*, 2008).

Therefore, while seed translocation has been identified as a potential driver of genetic changes in mussel populations, with the main drivers of the genetic structure of mussels in a particular area appearing to be linked to either ecosystem (water temperatures) or ecological (e.g. exposure, substrate type, sub/intertidal) factors, it seems likely these ecosystem and ecological factors may represent more powerful drivers of genetic change than the translocation of seed.

Studies have shown the south, west and northern coasts of the island of Ireland to form part of the hybrid zone with widespread distribution of both “pure” *M. edulis* and *M. galloprovincialis* as well as interspecific hybrids (Figure 1) (Gosling and Wilkins, 1981; Koehn, 1991; McDonald *et al.*, 1991; Gosling, 1992; Gosling *et al.*, 2008; Kijewski *et al.*, 2009; Matís, 2010; Fly *et al.*, 2015). Indeed Matís (2010) identified the presence of *M. trossulus* alleles in a small sample of rope mussels taken in Roaringwater Bay in the southwest of Ireland in 2008 as well as a new previously unknown allele that could not be attributed to either of the three species. Therefore the situation as regards the genetic structure of mussel populations is complex with at least three “species” as well as different hybrids being present.

On the other hand studies have shown *Mytilus* population in the Irish Sea to be composed exclusively of *M. edulis*; this may be due to average winter water temperatures in the Irish Sea falling below the perceived critical minimum for *M. galloprovincialis* (i.e. below 9°C), thermal front development at the northern and southern entrances to the Irish Sea in late spring, thereby preventing an influx of spring-spawned *Mytilus* larvae (Gosling *et al.*, 2008) or due to the lack of translocation of mussels from outside to inside the Irish Sea for culture activities.

To put the translocation activities involved in this fishery in context, mussels are either moved within the Irish Sea which has been shown to be populated solely by *M. edulis* or from outside of Cromane Harbour (or the Irish Sea) to within the harbour. Genetic analysis of seed mussels from Cromane have been shown to have a high frequency of *M. edulis* 87.5% with the remaining individual having alleles from *M. edulis* along with a previously unobserved allele that is neither *M. edulis*, *M. galloprovincialis*, nor *M. trossulus*. Unfortunately, in that study 12 of the 20 sample individuals had issues which prevented the genetics lab from being able to successfully genotype them (Matís, 2010).

In addition previous attempts at relaying rope mussel seed (which is known to contain high frequencies of *M. galloprovincialis* and hybrids) on the bottom for ongrowing have been unsuccessful with the re-laid individuals exhibiting high mortality. This is thought to be as result of high levels of *M. galloprovincialis* within the rope mussel seed which is ill-suited to bottom culture (BIM pers comms).

Therefore, given the areas fished, in terms of both location and of substrate and depth range (which are known to be “*Mytilus* areas”) and the method of culture employed (which is thought, given the anecdotal information available, to favour *M. edulis*) it is likely that the bottom grown mussel fishery involves exclusively (or almost exclusively *Mytilus edulis*); as a result all seed mussels fished and harvested are assumed to be *M. edulis*. In any case, the various *Mytilus* species and their hybrids ‘perform indistinguishable ecosystem roles meaning that there are no particular ecological concerns arising from changes between the various forms in a particular area.

3.2.2. Biology, ecology, and life history of blue mussels

The blue mussel (*Mytilus edulis*) a bivalve of the Family Mytilidea which is commercially exploited off the coast of Republic of Ireland, Northern Ireland, Iceland, Scotland, England, Wales, France and the Netherlands. *Mytilus edulis* is the only mussel cultured on the island of Ireland. The blue mussel is widely distributed and adapts itself to a wide variety of ecological situations.

Mussels are filter feeders, feeding on phytoplankton and suspended organic matter, thus feeding entirely on natural food present in the water column. This reliance on a natural food source, coupled with their general sessile nature, makes them ideal for cultivation.

3.2.2.1. Distribution

Mytilus edulis is found in coastal areas of the northern Atlantic Ocean, including North America, Europe, and the Northern Palearctic. They are found from the White Sea in Russia to southern France, throughout the British Isles, with large commercial beds in the Wash, Morecambe Bay, Conway Bay and southwest England, north Wales, and west Scotland. In the western Atlantic, *M. edulis* occupies the southern Canadian Maritime provinces to North Carolina. In Europe the distribution of *Mytilus edulis* overlaps with that of the closely related Mediterranean mussel (*Mytilus galloprovincialis*) and their taxonomic differentiation remains under debate; note there is widespread evidence of hybridisation between the two species.

Mussels can tolerate fluctuating salinities, desiccation, and temperature and oxygen concentration, characteristics that result in the ability to occupy a large variety of microhabitats. As a result they can be found from the intertidal zone down to depths of about 100m. As is the case with many other bivalve species, mussels anchor themselves to a secure substrate using byssus threads.

3.2.2.2. Mussel beds

Mussels tend to aggregate in patches called beds with the natural extent of these beds being determined by favourable local conditions, such as water temperature, food availability, substrate type, as well as spawning and settlement success. In the Irish Sea, recruitment (i.e. recruitment direct from larval stage) of blue mussel into mussel beds varies spatially; depending on the larval behaviour and the prevailing oceanographic conditions. Around the island of Ireland two types of beds have been described permanent beds and 'seed mussel' beds (Maguire et al., 2007); the characteristics of each type are outlined below:

- **Permanent mussel beds** – are characteristic of many areas, are usually intertidal and receive regular (or periodic) spat settlement. Permanent beds therefore contain mussels from a range of age classes.
- **Seed mussel beds** – generally occur in highly dynamic areas with mobile sediment and receive only periodic settlements of spat. As a result of the highly dynamic nature of areas in which they occur and the vulnerability of juveniles to predation, seed mussel beds do not generally persist beyond a few months post formation or until the following winter. Due to the way in which they are frequently lost to winter storms (through dispersal, erosion or smothering) or predators, seed mussel beds are often referred to as being ephemeral (i.e. lasting for a very short time).

Subtidal blue mussel beds have a medium sensitivity to abrasive, penetrative and extractive pressures (Tillin and Mainwaring, 2016). The exploitation of each of the two types of mussel beds described above will have very different consequences for the overall mussel population. While permanent beds can be expected to be a source of larvae, seed mussel beds are not expected to produce larvae, or at least to a much lesser extent, since mussels mortality in these beds is very high before mussels reach reproductive maturity. It is thus preferable to exploit these seed beds, rather than permanent mussel beds where possible. The BIM survey dataset which covers over 30 years shows that while some beds exploited by the seed fishery may occasionally overwinter, no bed overwinters in every year, therefore they are classed as ephemeral beds.

Due to the preferable consequences of targeting ephemeral rather than permanent mussel beds the harvest strategy described throughout this assessment is based on targeting ephemeral mussel seed beds which due to their high natural mortality during the first year, can be considered surplus to Irish mussel stock productivity. The objective of the strategy is therefore to ‘collect’ mussel seed and relay in the less exposed, mussel lays to allow for on-growing and later harvesting. Productivity (i.e. the number of individuals surviving to a marketable size) is expected to be much greater in these on-growing areas as a consequence of reduced mortality due to both environmental phenomena and predation.

In addition since the harvest of mussel seed is considered surplus to mussel stock productivity, the total mussel seed allocated to the fishery is not associated with a quantity that ensures high productivity of the target populations (i.e. a target Spawning Stock Biomass (SSB)). Instead, it is based on the available seabed in the on-growing locations located around the coastline of the island of Ireland where bottom cultivation takes place.

Figure 2 below shows evidence of the fact that while seed mussel beds often occur in the same general area their exact location varies from year to year.

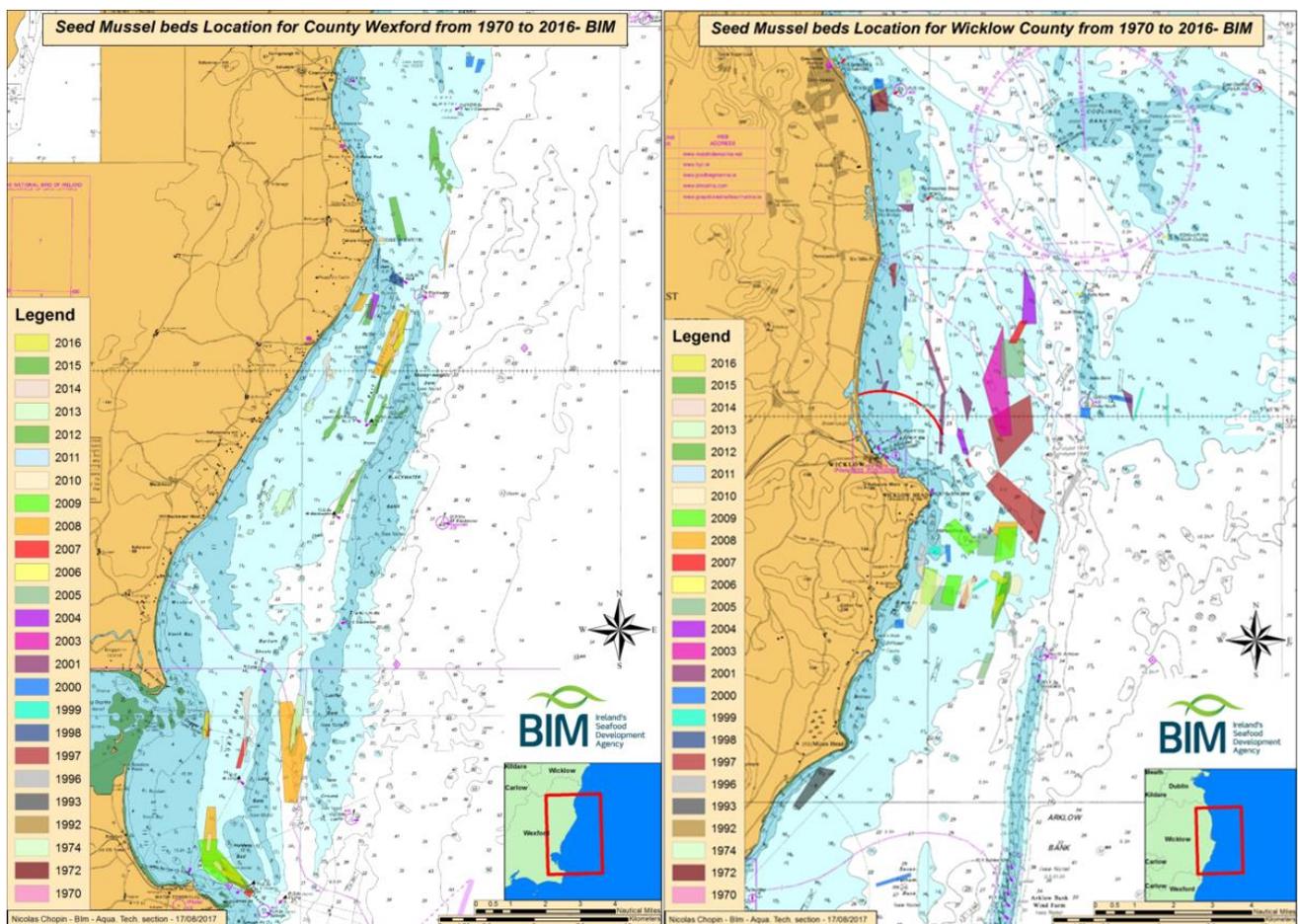


Figure 2. Locations of seed mussel beds off Counties Wexford (left) and Wicklow (right) in the southern Irish Sea (1970 – 2016) (Source: BIM).

3.2.2.3. Age and Growth

The life cycle can be divided into the free swimming larval phase and the largely sedentary juvenile and adult phase. The growth rate of mussels depends largely on the availability of food. Growth of mussels inhabiting mussel beds is lower than mussels growing in suspended systems due to food competition and limitations of transport rates of food to the bottom.

The lifespan of *Mytilus edulis* may vary considerably depending on location. Settling in more exposed coastal areas may make individuals significantly more vulnerable to predation while the quality and stability of the substrate also plays a role in the lifespan. Drifting larval and juvenile stages suffer the highest mortality rates. While mussels may live in excess of 20 years in the wild, in a mussel-culture setting as is the case here their rapid growth rate when in favourable conditions means they may be ready for harvesting in as little as 2 – 3 years depending on on-growing location.

3.2.2.4. Natural Mortality

Blue mussels are most often found in large mussel beds, where they are somewhat protected from predation by virtue of their numbers. Their shell also acts as a protective layer, though some predator species are able to crush the shell. Known predators of blue mussels include flounders (*Pleuronectiformes*), sandpipers (*Scolopacidae*), gulls (*Larus*), crows (*Corvus*), dogwhelks (*Nucella lapillus*) and starfishes (particularly the common starfish (*Asterias rubens*)). The presence of large numbers of starfish on a seed mussel bed may prompt the early opening of a fishery on that bed so as to prevent the seed mussel resource being lost.

3.2.2.5. Feeding Habits

Blue mussels are suspension filter feeders collecting anything in the water column that is small enough to ingest. Their diet consists of phytoplankton, dinoflagellates, small diatoms, zoospores, flagellates, other protozoans, various unicellular algae, and detritus filtered from the surrounding water. Thus even in a mussel culture setting mussels feed entirely on food naturally present in the water column which makes them ideal for cultivation.

3.2.2.6. Reproduction and early life history

The blue mussel is diecious, though rare instances of hermaphroditism have been reported. Mussels generally produce gametes and are ready to spawn by the time they are one year old. During spawning eggs and sperm are released to the water column and fertilisation occurs externally. After fertilization occurs, the fertilised zygotes undergo several metamorphoses before settlement. Mussels settle after the sixth larval stage. The planktonic life of *Mytilus edulis* varies from 2 – 4 weeks depending on temperature, food supply and availability of suitable settlement substratum. A generalized blue mussel life cycle is presented in Figure 3 below.

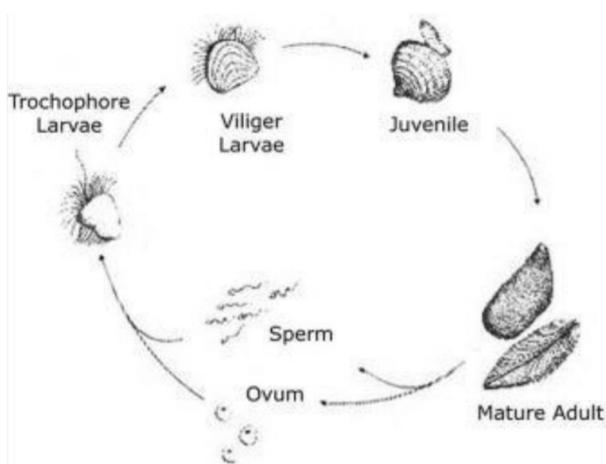


Figure 3. Generalized life cycle of the blue mussels.

Generally the potential spawning season vary according to location, depending on water temperature, currents, and other environmental factors. In most populations, resting gonads begin to develop from October to November, with gametogenesis occurring throughout winter so that gonads are mature in early spring. A partial spawning in spring is followed by rapid gametogenesis, with gonads maturing by early summer, resulting in a less intensive secondary spawning in late August or September. On the east coast of the Island of Ireland two spawning seasons can be identified, May-June and September-early December.

3.2.3. Fishery location

The fishery is comprised of two parts; a seed mussel fishery (during which seed mussels are fished from ephemeral beds and re-laid for ongrowing in specifically licensed areas) and the harvesting of market sized mussels from on-growing areas. In the past the activities covered by this certificate could potentially take place across two jurisdictions namely those of Northern Ireland and the Republic of Ireland but due to recent legal developments the activities covered by this certificate currently take place solely within Northern Irish waters. At present only catches of seed mussels, caught by members of the client group using modified Dutch dredges, within Northern Irish waters (i.e. the area shaded green in Figure 4) and ongrown in designated bays of the Northern Ireland (i.e. the areas shaded red in Figure 4) are included in the Unit of Certification (UoC).

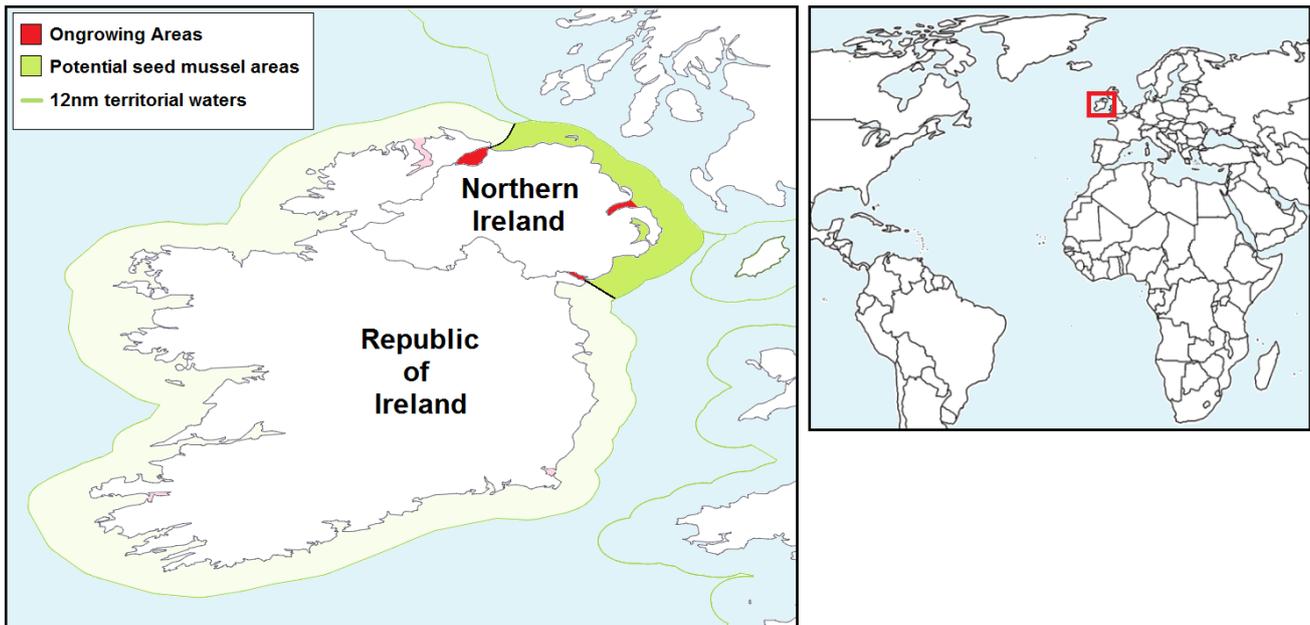


Figure 4. Potential seed mussel and ongrowing areas within coastal waters of Northern Ireland (Areas in which NI vessels may currently fish for seed mussels are shaded in bright green).

3.2.4. Fishing gears and methods

While seed fishing may use a variety of dredge types, including smaller more lightweight ‘hand dredges’, by far the most common is the modified Dutch design. Mussel vessels on the island of Ireland most commonly use between 2 and 4 dredges with a ‘mouth’ width of 2 – 4 m although dredges with a ‘mouth’ width of 2 – 2.5 m predominate which are towed behind the vessel on a steel cable (warp).

Mussel dredges have a flat bar at their leading edge where they interact with the seabed that is designed to skim the surface of the substrate without digging into it. This bar in effect ‘peels’ the overlying seed mussel ‘mat’ away from the underlying substrate and in doing so removes the mussel seed which is caught in a bag which follows the bar. The bottom part of the bag is made up of either a chain link matrix or a nylon mesh while the upper part of the bag is made of nylon mesh. Where a chain link matrix is used on the lower part of the bag it is common practice for a rubber mat or rope dollies (bits of chafed ropes) to be attached to the belly of the dredge to minimise disturbance of the substrate. In addition operators commonly use steel bars across the mouth of the dredge to prevent large rocks or other non-target material from entering the dredge.

3.2.5. History of the fishery

A blue mussel seed fishery developed in the late 1960’s by the Irish fleet. In its initial phase the bottom grown mussel industry on the island of Ireland developed using imported second-hand Dutch mussel dredgers to fish for mussel seed, primarily in the Irish Sea. In the late 1990’s new production grounds were allocated and heavy investment led to the arrival of the dynamic bottom mussel culture industry.

Historically the bottom grown mussel sector has been dependent on the supply of seed mussels harvested from wild subtidal stocks principally in the southern Irish Sea and at Skullmartin off Co. Down (Northern Ireland). There have also been sporadic spat falls in and around the growing areas in Lough Swilly, the Foyle, Carlingford and Cromane. Seed settlements have also been reported off the Co. Down coast at the Feathers and at Donaghadee Sound. Total quantities fished are variable and recently subject to a resource allocation system set by the respective government departments in Northern Ireland and Ireland.

Seed collection normally takes place in mid to late summer/autumn. Harvesting of finished mussel for market from the licensed/leased beds may take place throughout the year. The most frequent locations for seed collection includes off the Ards Peninsula (Northern Ireland) and off Wicklow Head (East of India Bank) (Co. Wicklow, Ireland) and from Wicklow Head to Mizen Head and South of Cahore Point (Wexford).

3.2.6. Economic and market information

Bottom mussels are sold in fresh (live) and prepared forms (fresh, frozen vacuum packed mussel in sauce) and more advanced ready meals (half shell with toppings) and as frozen meats into the wholesale, retail and food service markets. Products are largely exported to Europe (France, Benelux (Belgium, the Netherlands, and Luxembourg), the UK, Germany and others) and US (prepared frozen mussels in sauce). The main competition for Irish mussels comes from France and Holland and that the demand for Irish mussels has suffered in recent years in the face of abundant Dutch supply.

According to the BIM Annual Aquaculture Survey 2018¹ production of mussels from the bottom cultured sector in IE in 2017 totalled 7,800 tonnes with a value of approx. €9 million. In 2017 IE bottom grown mussels sector grew 53% in terms of value and 22% in volume when compared to 2016. Production in IE peaked in 2003 at 39,289 tonnes but subsequent poor recruitment to the seed mussel beds led to a significant decline (Figure 5).

Production has increased in recent years and with better recruitment of seed production will likely to increase in the next few years as this seed is ongrown to market size.

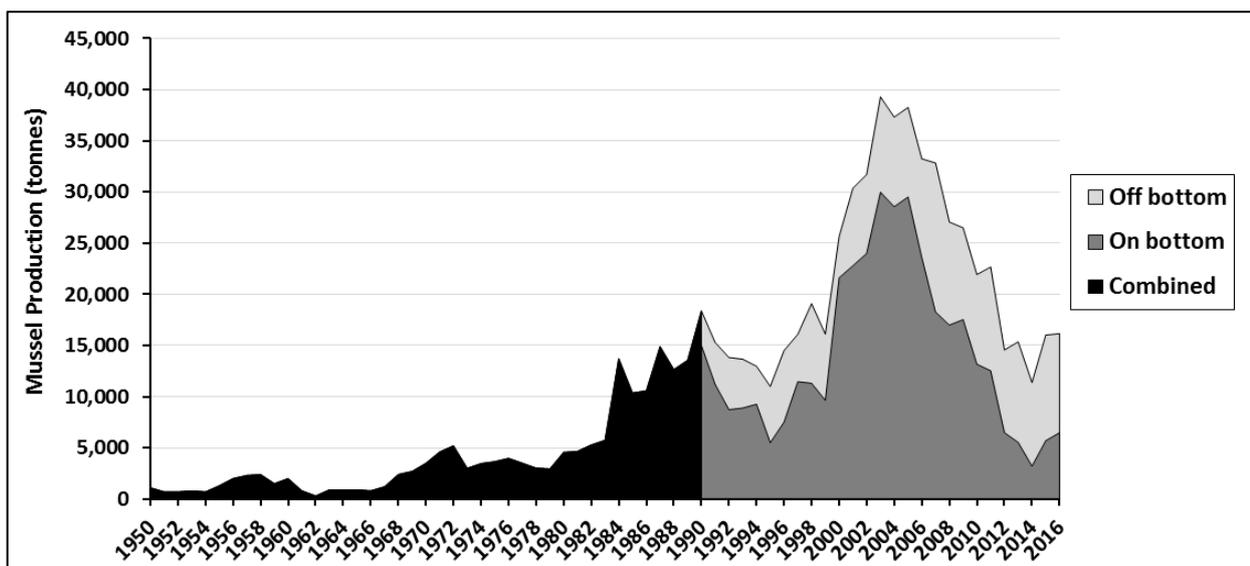


Figure 5. Annual production of bottom grown mussel in Ireland (1950 – 2016) with landings split between on and off bottom cultivation after 1990 (Source: FAO and Eurostat).

¹<http://www.bim.ie/media/bim/content/publications/corporate-other-publications/7097-BIM-Business-of-Seafood-2017.pdf>

In NI mussels production accounts for 85% of aquaculture output and in 2011 produced 7,613 tonnes worth in excess of UK£ 5.5 million; more recent statistics for Northern Ireland production are not available as Northern Ireland statistics are generally reported in combination with overall United Kingdom statistics.

3.2.7. Legal/administrative status of the fishery

The regulatory framework for the BG mussel sector includes; the Common Fisheries Policy and associated EU legislation; the Fisheries Amendment Act 1997 (IE legislation) and the Sea Fisheries & Maritime Jurisdiction Act 2006 as amended (IE legislation); the Fisheries Act (Northern Ireland) 1966, as amended (NI legislation) Sea Fisheries Act 1968 and the Sea Fish (Conservation) Act 1967, as amended (UK legislation) and the Foyle and Carlingford Fisheries Order 2007.

Regulation of this sector has required connectivity between IE and NI regimes – licences for large areas of seabed for extensive mussel re-laying have been granted in both IE and NI and the seed mussel fishery is managed as a shared resource between the jurisdictions.

The IE Department of Agriculture, Food and Marine (DAFM) is the main fisheries management body in the Republic of Ireland. In addition DAFM provide corporate governance for the Marine Institute, the Sea Fisheries Protection Agency (see below) and BIM (the Irish State agency with responsibility for developing the Irish Sea Fishing and Aquaculture industries, established under the Sea Fisheries Act 1952).

In NI the Department of Agriculture, Environment and Rural Affairs (DAERA) is the main fisheries management body. In addition DAERA provide corporate governance for AFBI and the Sea Fisheries Inspectorate.

Dredging of mussel seed by Irish registered vessels and reseeded of the seed for the purposes of on-growing within the exclusive fishery limits of Ireland may take place only on issue of a licence under the Mussel Seed (Conservation of Stocks) Order 1987, (S.I. No. 118 of 1987) as amended by the Mussel Seed (Conservation and Rational Exploitation) Order 2003 (S.I. No. 241 of 2003). Such licences are issued by DAFM.

In Northern Ireland, dredging and movement of seed mussels is controlled by means of a licence granted by DARD under the Sea Fish Conservation Act 1967. In Northern Ireland under the Molluscan Shellfish (Control of Deposit) Order (Northern Ireland) (SR 1972 No 9) mussel seed imported from outside Northern Ireland waters can only be reseeded under the authority of a permit granted by DARD.

3.3. Principle One: Target Species Background

The target species in this fishery is the blue mussel (*Mytilus edulis*); another mussel species, *Mytilus galloprovincialis*, as well as hybrids of the two species have been isolated on the west coast of Ireland. To date neither *M. galloprovincialis* or *M. edulis*:*M. galloprovincialis* have been observed in the Irish Sea where the primary seed harvesting and cultivation sites are located and *M. galloprovincialis* is not thought to be suitable for bottom cultivation. In any case as *M. galloprovincialis* is present around the Irish coast the potential for the movement of *M. galloprovincialis* into sites in which it was previously not present, must be considered.

In this assessment Principle 1 covers seed harvesting only. As vessels can potentially harvest seed in either jurisdiction (albeit Northern Irish vessels cannot currently fish in Republic of Ireland waters) before relaying the seed onto cultivation sites in their respective jurisdiction, the assessment of Principle 1 essentially considers the Northern Ireland and Ireland fisheries as a single entity.

3.3.1. Stock status and Monitoring

It is extremely difficult to provide an assessment of seed mussel stock status based on annual surveys, because seed mussel settlement is so temporally and spatially variable. In addition seed mussels are harvested from ephemeral beds where they are expected to experience extremely high or even total natural mortality. These ephemeral beds therefore likely contribute minimally, if at all, to the reproductive capacity of the wider mussel stock around the island of Ireland. On the other hand adult mussels (i.e. those that contribute to the reproductive capacity of the stock) are ubiquitous in coastal waters around the island of Ireland. Given the fact that they do not generally form surveyable beds any attempt to quantify their biomass would be extremely difficult and in any case of little use for the purposes of management.

Mussel stock biomass is therefore not assessed quantitatively and as such, without estimates of stock biomass and exploitation rates, target and limit reference points have not been identified. On that basis, the assessment team used the risk-based framework to evaluate the impacts of the seed fishery on the stock status of mussels around the island of Ireland. In brief the susceptibility of the mussel stock to the fishing activity is estimated to be minimal because:

- When compared to the distribution of the mussel stock around the island of Ireland the spatial scale of seed mussel harvesting activity is extremely limited.
- Seed mussel extraction only takes place from beds that are considered to be ephemeral.
- The practice of re-laying of seed and allowing it to mature into more reproductively-active and fecund adults has the potential to actually enhance recruitment to the wider stock; effectively in transferring seed mussels inshore to conditions more favourable to survival and growth the natural mortality of that component of the mussel stock is reduced.

While an assessment of the mussels stock in the true “stock assessment” sense is not carried out, seed mussel surveys are conducted to provide fishery managers and industry with the potential location of seed mussel beds and an estimate of the volume of available seed in each identified bed.

3.3.2. Harvest Strategy, Harvest Control Rules and Tools

Implicit within the management objectives for the seed mussel fishery is that the seed mussel beds are essentially ephemeral and so harvesting of seed mussel is considered highly unlikely to have any consequence for mussel population size; this is reflected in the harvest strategy. The strategy is therefore to manage the seed mussel fishery, and not to manage the Irish Sea mussel stock, and so conventional stock assessments with target and limit reference points are not appropriate in this fishery. Historically, mussel seed harvests have been of variable sizes and some years show much lower seed catches. Seed catches in 2017 (6,409 t) represented a decrease on the levels observed in the previous three years of 9,496 t, 9,334 t and 10,036 t in 2016, 2015 and 2014 respectively and are more in line with 2012 levels (7,003 t); note the 2011 seed fishery was much lower at 2,262 t.

The harvest strategy must ensure that susceptibility of the stock is maintained at or below acceptable levels given the productivity of the species. At present there are numerous rules in place to control the harvest of seed mussels including:

- Specific authorisation to fish for seed mussel must be held
- Authorisation comes into operation on specific date and states on which tides fishing is permitted
- Curfews (e.g. fishing prohibited between 18:00hrs and 06:00hrs in IE)
- Owner and/or master must complete an accurate EU logsheet and spat sheets
- Fully operational black box Vessel Monitoring System (VMS)
- Hold of the vessel to be marked in 0.5m segments
- Requirement to supply seed fishing information for seed fished in IE waters via text message (SMS) to a stock tracking database.

For the 2016 and 2017 season, arrangements for the management of the mussel fishery were formalised in: “Seed Mussel Fishery IE and NI - Schedule of Arrangements”; this was done in order to clearly define; 1) whether in a given season it was appropriate that a seed fishery take place, and; 2) if so when during the season a particular seed resource should be fished in order to achieve the greatest return.

At present the management arrangements constituting the harvest control rules for the mussel fishery are as follows:

- In early spring the BGMCF discuss and propose suitable tides (<7.1 m) for fishing mussel seed during the year. The proposed tides may then be approved by the Minister in IE and the Department in NI. If approved, suitable tides are set out in the mussel seed licenses/authorisations of both jurisdictions.
- In spring/summer BIM and AFBI conduct mussel seed surveys in their respective jurisdictions. Industry members may, with the appropriate permissions, conduct their own surveys and are obligated to report any “finds”. Seed mussel survey reports are published on the BIM and AFBI websites as they become available. In IE DAFM has set a minimum quantity of 1,500t that must be identified as being exploitable in the Irish Sea before it recommends the opening of a fishery. If surveys identify at least 1,500 t of exploitable mussel seed in the Irish Sea, BGMCF members, taking into account the results of the seed mussel surveys make a recommendation to the Ministers proposing dates for mussel seed fishing to take place.
- In IE the Minister considers the recommendation from the BGMCF, BIM’s survey results and other relevant information from other stakeholder entities such as the Marine Institute or the SFPA. Other relevant information might include, but is not limited to, disease control, invasive species, biotoxins or control and enforcement issues and/or interactions with protected areas. In NI, the BGMCF’s recommendations are considered by DAERA.
- In IE, if the Minister decides that a mussel seed fishery should take place, his/her decision is given legal effect by means of a statutory instrument in which the fishing of mussel seed is typically allowed for a defined period. In NI, DAERA may permit fishing for mussel seed in specific areas for a defined period.

The harvest control rules for the fishery also include a force-majeure provision that allows for the BGMCF to recommend to the Ministers on a case-by-case basis the fishing of an individual mussel seed bed outside of a regular fishing period in situations where the mussel seed is suitable for commercial fishing and confirmed to be under predation from starfish. Such predation presents a management challenge for the seed mussel fishery, where a balance must be achieved between allowing seed to grow and harden (in order to maximise survival in transport) and protecting the seed stock from predators.

Following a review of the available literature and discussions with survey officers, management arrangements have been formalised and include the following trigger points when starfish are detected in a seed mussel bed:

- At a level of 10 starfish m⁻² the BGMCF should immediately consult with industry members and scientific advisors as to the course of action that should be pursued for the bed.
- At a levels of 20 starfish m⁻² force majeure should immediately be implemented and the bed opened on the earliest available tide.

The fisheries open on the specified time and date and are fished by the appropriately licenced vessels. The fisheries remain open until;

- 1) fishers have reached their allocation;
- 2) the date of closure is reached, or;
- 3) the fishery is closed early.

A fishery might be closed early for a variety of reasons. In NI rules are in place to close the fishery when either the seed mussel to waste ratio in catches reaches 50:50 or quantities of benthic substrata begin to be observed. In IE economic factors are the primary driver of the point at which the fishing ceases. However, industry members can and do recommend the closure of the fishery if it is their view that the resource is exhausted and further fishing would cause unnecessary damage to benthic ecosystems. As an example the 2016 fishery in IE waters was closed early following a request from industry.

Annual seed allocations are based on the size of the cultivation site available for ongrowing seed mussel. While originally allocations were capped based on a reference formula of 40 t per ha over a three year growing cycle, in 2017 this formula was revised to 30 t/ha as an added level of precaution. As a result allocations increased in some areas while decreasing in others (Table 5).

Table 5. Total 2016 and 2017 mussel allocations.

Ongrowing Area	2016 allocation	2017 allocation	Change	
Castlemaine	5,550	5,150	7.2%	↓
Wexford	8,145	9,259	13.7%	↑
Carlingford	6,121	7,556	23.4%	↑
Belfast	6,969	6,049	13.2%	↓
Foyle	12,915	11,355	12.1%	↓
Swilly	250	950	280.0%	↑
Larne	185	185	0.0%	↔
Total	40,135	40,504	0.9%	↑

As a consequence of resource allocations being based on the notional carrying capacity of the cultivation site and not on the annual available biomass of seed mussel, the total seed mussel resource allocation is often much higher than the available seed, and therefore the total resource allocation has to date not been reached.

3.4. Principle Two: Ecosystem Background

The MSC CR v1.3 categorizes Principle 2 considerations into five components; which are considered to cover the range of potential ecosystem elements that may be impacted by a fishery; 1) Retained species, 2) Bycatch species, 3) ETP species, 4) Habitats and 5) Ecosystem.

Under each of the five P2 components there are three Performance Indicators (PIs):

- An 'Outcome' PI that considers the status of the impact or the risk that the fishery poses to that component.
- A 'Management Strategy' PI that considers the basis, reliability and implementation of the management strategy for the component.
- An 'Information' PI that considers the nature, extent, quality and reliability of the monitoring and information that is relevant to developing and implementing the management strategy and measuring the outcomes of the strategy.

Each of these five components and the elements considered within are discussed in detail in the following sections.

3.4.1. Analysis of non-target species

Assessment Teams are required to categorize non-target species into either the Retained species, Bycatch species or ETP species components. Note each P2 species may only be considered within one of the Retained species, Bycatch species or ETP species components. Therefore, if the bycatch species meets the definition of an ETP species is must be scored under the ETP section of the assessment tree.

Within the Retained and Bycatch species components, Assessment Teams are further required to determine and justify which species are considered 'main' and which are not for scoring outcome PIs against SGs 60 and 80; there is no "main" qualifier for SG100 and all species must be considered at the SG100 level. Main' allows consideration of the catch size, value (for retained species) or vulnerability of species caught. A species that comprises less than 5% of the total catch by weight may normally be considered to be a minor species (i.e., not 'main') in the catch, unless it is of particular vulnerability or if the total catch of the fishery is large, in which case even 5% may be a considerable catch.

In order to categorize bycatch species the Assessment Team examined data from logbook data and bycatch sampling. Besides mussels none of the species caught during mussel seed harvesting or cultivation are retained and sold for commercial gain. During the seed collection process mussel seed and other species caught are not separated but retained in bulk for translocation to the on-growing sites for relaying. Similarly during relaying of mussels other species caught alongside the mussels will be relayed together with the mussels. During the final harvest other species caught together with the target species, will be discarded.

All non-target species identified to the species level were considered and evaluated in order to determine under which category they should be assessed. Following the evaluation each individual species was placed into one of six categories; 1) Main Retained, 2) Minor Retained, 3) Main Bycatch, 4) Minor Bycatch, 5) Negligible Bycatch and 6) ETP species. Where:

Main Retained	Retained and $\geq 5\%$ of the total catch by weight (or $\geq 2\%$ of the total catch by weight for species considered to be particularly vulnerable).
Minor Retained	Retained and $< 5\%$ of the total catch by weight (or $< 2\%$ of the total catch by weight for species considered to be particularly vulnerable).
Main Bycatch	Not Retained and $\geq 5\%$ of the total catch by weight (or $\geq 2\%$ of the total catch by weight for species considered to be particularly vulnerable).
Minor Bycatch	Not Retained and $< 5\%$ of the total catch by weight (or $< 2\%$ of the total catch by weight for species considered to be particularly vulnerable).
Negligible Bycatch	Not Retained and $< 0.1\%$ of the total catch by weight.
ETP species	Endangered, Threatened and Protected species (see 3.4.4)

The results of the evaluation for each species are presented in Table 6 below and each category is discussed in detail in the following sections. Note that non-target catch that was not identified to species level was considered to be Negligible Bycatch as it could not be further identified. Additionally, encrusting organisms such as barnacles, anemones, seaweeds etc. are generally weighed along with the substrate they were attached to so for those organisms the figures presented below very likely represent an overestimation. Due to their role in increasing the structural complexity of the seabed, these organisms are considered under habitat PIs (PI 2.4.1, PI 2.4.2 and PI 2.4.3).

Table 6. Bycatch species from bycatch sampling programme conducted in 2016 and 2017

Species	Latin name	Vulnerable?	ETP?	Av. % cont. to tot.	Main/Minor/Negligible
Blue mussel	<i>Mytilus edulis</i>	No	No	50 – 99%	Target
Green crab	<i>Carcinus maenas</i>	No	No	<5%	Minor Bycatch
Spider crab	<i>Maja brachydactyla</i>	No	No	<5%	Minor Bycatch
Velvet crab	<i>Necora puber</i>	No	No	<0.1%	Negligible Bycatch
Porcelain crab	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Hermit crab	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Brown crab	<i>Cancer pagurus</i>	No	No	<0.1%	Negligible Bycatch
Squat lobster	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Dog whelk	<i>Buccinum undatum</i>	No	No	<0.1%	Negligible Bycatch
Common Star Fish	<i>Asterias rubens</i>	No	No	<0.1%	Negligible Bycatch
Sun star	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Brittle star	<i>Ophiuroidea spp.</i>	No	No	<0.1%	Negligible Bycatch
Shrimp	<i>Crangon crangon</i>	No	No	<0.1%	Negligible Bycatch
Worms	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Snails	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Anemone	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Urchin	<i>Echinoidea spp.</i>	No	No	<0.1%	Negligible Bycatch
Butterfish	<i>Stromateidae spp.</i>	No	No	<0.1%	Negligible Bycatch
Scorpion Fish	<i>Scorpaenidae spp.</i>	No	No	<0.1%	Negligible Bycatch
Goby	<i>Gobiidae spp.</i>	No	No	<0.1%	Negligible Bycatch
Juvenile Fish	<i>Not identified to species level</i>	No	No	<0.1%	Negligible Bycatch
Nudibranch	<i>Nudibranchia spp.</i>	No	No	<0.1%	Negligible Bycatch
Flounder	<i>Platichthys flesus</i>	No	No	<0.1%	Negligible Bycatch
Red whelk	<i>Neptunea antiqua</i>	No	No	<0.1%	Negligible Bycatch
Cockle	<i>Cardiidae spp.</i>	No	No	<0.1%	Negligible Bycatch
White gastropods	<i>Philine</i>	No	No	<0.1%	Negligible Bycatch
Scallop	<i>Pectinidae spp.</i>	No	No	<0.1%	Negligible Bycatch
Periwinkle	<i>Littorina littorea</i>	No	No	<0.1%	Negligible Bycatch
Sea squirt	<i>Ascidacea spp.</i>	No	No	<0.1%	Negligible Bycatch
Stones/shells/waste		No	No	<0.1%	Habitats
Mixed seaweed	<i>Not identified to species level</i>	No	No	<0.1%	Habitats

Bycatch sampling programme

During the autumn and winter of 2016 and 2017 samples were taken from the main seed areas of the Irish Sea by BIM personnel and the harvest areas were sampled by industry members with the assistance of BIM regional staff. The following parameters are recorded: width of the dredge, speed of tow, length of tow, weight of mussel and weight of bycatch. Accurate recording of the bed size as part of the seed surveys allowed bycatch to be assessed as a component of a typical commercial harvest of seed.

Spider crabs were found to be the main bycatch species on the seed beds in the BIM 2016 and 2017 surveys but this species was not found in catches in the commercial fishery. Spider crabs have been previously documented in the vicinity of seed beds in the southern Irish Sea (MI & BIM, 2014; BIM, 2016) and are known to predate on mussel beds.

In Northern Ireland bycatch data were collected during the 2016 seed mussel fisheries at Feathers and Burial Island. The catches of 11 vessels were examined to determine the bycatch composition among other factors such as waste composition. A number of samples were taken for size/weight for FHI inspections records plus a sample was submitted to AFBI for genetic studies. All the data obtained were sent to BIM and SFPA.

3.4.2. Retained species

Retained species are species that are retained by the fishery (usually because they are commercially valuable or because they are required to be retained by management rules). No species other than mussels are retained by the fishery; therefore, there are no Main and/or Minor Retained species.

3.4.2.1. Main Retained species

There are no Main Retained species.

3.4.2.2. Minor Retained species

There are no Minor Retained species.

3.4.3. Bycatch species

Bycatch species are species that have been taken incidentally and are not retained. This may be a variety of reasons including their having no commercial value or their retention being specifically prohibited.

The incidental capture of other species during seed mussel dredging may have an impact on the population dynamics and sustainability of by-catch species, particularly if they themselves are subject to a fishery. Reports by fishermen and governmental agencies in the IE and NI indicate that bycatch levels are very low and have been estimated to be below 1%. These minor by-catch species in seed mussel dredging are the invertebrate predators such as – starfish, crabs and common whelks and small fish such as Dab and Plaice.

The results of bycatch sampling programme carried out by BIM and DEARA found the predominant organisms identified as bycatch in the fishery were green crab, spider crab, starfish and worms; other species were identified but in low percentages. As expected the majority of bycatch is made up of either fouling organisms or organisms that predate on mussels.

Bycatch data in the harvest areas reflect the experiences of industry members who, during the initial assessment of the Bottom Grown Mussel fishery, highlighted starfish as the predominant bycatch species in Belfast, weed and sea squirts at high levels in Carlingford and green crab and starfish posing the threat to mussel stocks in Castlemaine and Wexford.

3.4.3.1. Main Bycatch species

Main Bycatch species are species that are not retained and that represent $\geq 5\%$ of the total catch by weight on average (or $\geq 2\%$ of the total catch by weight for species considered to be particularly vulnerable). Analysis of bycatch data did not show any species exceeding the threshold for consideration as a Main Bycatch species. As a consequence there are no Main Bycatch species.

3.4.4. Minor Bycatch species

Minor Bycatch species are species that are not retained and that represent <5% of the total catch by weight (or <2% of the total catch by weight for species considered to be particularly vulnerable). Only two species, green crab (*Carcinus maenas*) in the harvest areas and spider crab (*Maja brachydactyla*) in the seed mussel areas, met the definition of Minor Bycatch species for the purpose of this assessment.

Spider crabs were found to be the major bycatch species on the seed beds in the 2016 survey. Spider crabs have been previously documented in the vicinity of seed beds in the southern Irish Sea (MI & BIM, 2014) and are known to predate on mussel beds. Spider crabs were identified in high numbers in Rosslare during the bycatch surveys. However, during the site visit and the interviews with the crew of the seed surveys and the industry, the assessment team was provided with information about the reasons behind the higher than expected % of this species. The numbers were driven by just in one sample while spider crab numbers in the rest of the samples was much lower. In addition a prevalence of spider crabs was not observed during the actual seed mussel fishery which took place approx. one month following the survey. As such spider crab bycatch is not thought to be a particular concern in the fishery; however continuing monitoring is necessary to determine if there is any increase in the level of risk due to changes in the spatial distribution of spider crabs.

3.4.4.1. Negligible Bycatch Species/Components of Bycatch

Negligible Bycatch species are species that are not retained and that represent <0.1% of the total catch by weight (so for every 1000 kg of catch they represent on average less than 1 kg). Additionally any component of the bycatch that was not identified to species level was considered to be Negligible Bycatch as it could not be further identified.

A complete list of species/components of the bycatch that were treated as Negligible Bycatch is presented in Table 6 above. Negligible species are not considered further in this Assessment.

3.4.5. ETP species

ETP species are Endangered, Threatened or Protected Species.

Assessment teams are required to consider Endangered, Threatened or Protected (ETP) species as species that are recognised by national ETP legislation and/or species listed in Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered.

Species on non-binding lists (e.g. the IUCN Red List), or those recognised at intergovernmental level (e.g. FAO International Plans of Action) are not recognised as ETP species for the purpose of an MSC assessment against MSC CR v1.3 and should be assessed under Retained or Bycatch Species components.

The list of potential ETP species (i.e. those listed that might potentially come into contact with the bottom grown mussel fishery) is presented in Table 7 below.

Table 7. ETP species in the area of operation of the Bottom Grown Mussel fishery that are recognized by national ETP legislation and/or listed in binding international agreements.

Group	Species	Latin	Listed ²	ETP Status
Reef	Sabellaria reefs	<i>Sabellaria alveolata/spinulosa</i>	OPSAR	Threatened
Reef	Modiolus reefs	<i>Modiolus modiolus</i>	OSPAR	Threatened
Mammal	Otter	<i>Lutra lutra</i>	EUHD, WA	Protected
Fish	Brook lamprey	<i>Lampetra planeri</i>	EUHD	Protected
	River lamprey	<i>Lampetra fluviatilis</i>	EUHD	Protected
	Salmon	<i>Salmo salar</i>	EUHD, OSPAR	Protected
	Sea lamprey	<i>Petromyzon marinus</i>	EUHD, OSPAR	Protected
Shellfish	Freshwater pearl mussel	<i>Margaritifera margaritifera</i>	EUHD, WA	Protected
Birds	Bar-tailed Godwit	<i>Limosa lapponica</i>	EUBD, AEWA	Protected
	Bewick's Swan	<i>Cygnus columbianus</i>	EUBD, AEWA	Protected
	Black-headed Gull	<i>Larus ridibundus</i>	AEWA	Protected
	Black-tailed Godwit	<i>Limosa limosa</i>	EUBD, AEWA	Protected
	Chough	<i>Pyrrhocorax pyrrhocorax</i>	EUBD, Bird Amber	Threatened
	Common Gull	<i>Larus canus</i>	AEWA, Bird Amber	Threatened
	Common Scoter	<i>Melanitta nigra</i>	EUBD, Bird Red, AEWA	Threatened
	Common Tern	<i>Sterna hirundo</i>	EUBD, Bird Amb., AEWA	Threatened
	Coot	<i>Fulica atra</i>	EUBD, Bird Amb., AEWA	Threatened
	Cormorant	<i>Phalacrocorax carbo</i>	Bird Amb., AEWA	Threatened
	Curlew	<i>Numenius arquata</i>	EUBD, Bird Red, AEWA	Threatened
	Dunlin	<i>Calidris alpina</i>	EUBD, Bird Amb.	Protected
	Eider	<i>Somateria mollissima</i>	EUBD, Bird Amb., AEWA	Threatened
	Golden Plover	<i>Pluvialis apricaria</i>	EUBD, Bird Red, AEWA	Threatened
	Goldeneye	<i>Bucephala clangula</i>	EUBD, Bird Amb., AEWA	Threatened
	Great Crested Grebe	<i>Podiceps cristatus</i>	Bird Amb., AEWA	Protected
	Greenland White-fronted Goose	<i>Anser albifrons flavirostris</i>	EUBD, Bird Amb., AEWA	Threatened
	Greenshank	<i>Tringa nebularia</i>	Bird Amb., AEWA	Protected

² OSPAR Convention for the protection of the marine environment of the North-east Atlantic [1992]

AEWA Agreement on the Conservation of African-Eurasian Migratory Waterbirds [1999]

EUBD EU Birds Directive [Council Directive 79/409/EEC]

EUHD EU Habitats Directive [Council Directive 92/43/EEC]

WA Wildlife Act, 1976 & Wildlife (Amendment) Act, 2000

Group	Species	Latin	Listed ²	ETP Status
	Grey Heron	<i>Ardea cinerea</i>	AEWA	Protected
	Grey Plover	<i>Pluvialis squatarola</i>	Bird Amb., AEWA	Protected
	Greylag Goose	<i>Anser anser</i>	EUBD, Bird Amb., AEWA	Threatened
	Hen Harrier	<i>Circus cyaneus</i>	EUBD, Bird Amber	Protected
	Herring Gull	<i>Larus argentatus</i>	Bird Red, AEWA	Threatened
	Knot	<i>Calidris canutus</i>	Bird Red, AEWA	Threatened
	Lapwing	<i>Vanellus vanellus</i>	EUBD, Bird Red, AEWA	Threatened
	Lesser Black-backed Gull	<i>Larus fuscus</i>	Bird Amb., AEWA	Protected
	Little Grebe	<i>Tachybaptus ruficollis</i>	Bird Amb., AEWA	Protected
	Little Tern	<i>Sterna albifrons</i>	EUBD, Bird Amb., AEWA	Threatened
	Mallard	<i>Anas platyrhynchos</i>	EUBD, AEWA	Protected
	Oystercatcher	<i>Haematopus ostralegus</i>	Bird Amb., AEWA	Protected
	Pintail	<i>Anas acuta</i>	EUBD, Bird Red, AEWA	Threatened
	Red-breasted Merganser	<i>Mergus serrator</i>	EUBD, AEWA	Protected
	Redshank	<i>Tringa totanus</i>	Bird Red, AEWA	Threatened
	Red-throated Diver	<i>Gavia stellata</i>	EUBD, Bird Amb., AEWA	Threatened
	Ringed Plover	<i>Charadrius hiaticula</i>	Bird Amb., AEWA	Protected
	Sanderling	<i>Calidris alba</i>	Bird Red, AEWA	Threatened
	Sandwich Tern	<i>Sterna sandvicensis</i>	EUBD, Bird Amb., AEWA	Threatened
	Scaup	<i>Aythya marila</i>	EUBD, Bird Amb., AEWA	Threatened
	Shelduck	<i>Tadorna tadorna</i>	Bird Amb., AEWA	Protected
	Shoveler	<i>Anas clypeata</i>	EUBD, Bird Red, AEWA	Threatened
	Teal	<i>Anas crecca</i>	EUBD, Bird Amb., AEWA	Threatened
	Turnstone	<i>Arenaria interpres</i>	AEWA	Protected
	Whooper Swan	<i>Cygnus cygnus</i>	EUBD, Bird Amb., AEWA	Threatened
	Wigeon	<i>Anas penelope</i>	EUBD, Bird Amb., AEWA	Threatened

The EU Birds Directive provides for a network of sites in all Member States to protect birds at their breeding, feeding, roosting and wintering areas. It identifies species which are rare, in danger of extinction or vulnerable to changes in habitat and which need protection. In Ireland, there are 25 of these species regularly occurring including Bewicks and Whooper Swan, Greenland White-Fronted and Barnacle Geese, Corncrake, Golden Plover, Bar-Tailed Godwit, five species of tern, birds of prey including Hen Harrier, Peregrine, Merlin as well as the Nightjar, Kingfisher and Chough.

[The EU Birds Directive \(79/409/EEC\)](#) requires designation of SPAs for:

- Listed rare and vulnerable species such as those mentioned above.
- Regularly occurring migratory species, such as ducks, geese and waders.
- Wetlands, especially those of international importance, which attract large numbers of migratory birds each year. (Internationally important means that 1% of the population of a species uses the site, or more than 20,000 birds regularly use the site.)

The main mussel sites in both IE and NI all have several types of statutory designation. The majority of important mussel culture sites around the island lie in or close to protected areas of some kind, and the majority of licence applications and renewals are subject to a test of significance/screening and an Appropriate Assessment if required. The main sites in the IE have been designated as cSACs under Natura 2000, and are also Natural Heritage Areas (IE national designation).

The main mussel areas in NI are not designated as SAC's but are protected as SPA's under Natura 2000 for their importance for birds, areas are also designated as ASSI's (NI national designation). Several sites in IE and NI are also designated under the Ramsar Convention as wetlands of international importance; this is also

mainly due to their role in supporting resident or migratory bird populations. Activities such as bottom mussel culture require a test of significance/screening and an Appropriate Assessment if required for licensing in or adjacent to a protected area.

SPAs are sites that have been selected and notified for the conservation and protection of bird species listed on Annex I of the Birds Directive and regularly occurring migratory species, and their habitats, particularly wetlands. Annex I birds are those that require special conservation measures because they are rare, in danger of extinction, or vulnerable to habitat changes in the EU. IE supports populations of 33 Annex I bird species. The SPA network includes important seabird colonies, wintering waterfowl sites, and sites supporting rare species (e.g. the corncrake). It is important to note that Natura 2000 network is not static but varies. The Department is currently examining the requirements under the Birds Directive for additional designations or re-designations of SPAs. The possibility also exists that additional SACs may require to be designated.

In IE, the National Parks and Wildlife Service (NPWS) of the Department of Housing, Planning and Local Government is charged with the conservation of a range of habitats and species in Ireland under the Natura 2000 scheme. In addition Natural Heritage Areas (NHAs) form the basic designation for wildlife in Ireland. They are legally protected from the date that they are formally proposed under the Wildlife Amendment Act, 2000. Many of the designations overlap with SACs and SPAs.

Several sites are also designated under the Ramsar Convention as wetlands of international importance; this is also mainly due to their role in supporting resident or migratory bird populations.

In NI, The Northern Ireland Environment Agency (NIEA) is an Agency within the Department of Agriculture Environment and Rural Affairs which advises on, and implements, the Government's environmental policy and strategy in Northern Ireland. Areas of importance are formally designated under various pieces of national and international legislation and include; Areas of Special Scientific Interest (ASSIs), Natura 2000 sites (SACs and SPAs), Nature Reserves, Marine Nature Reserves, Ramsar sites, Areas of outstanding natural beauty and World Heritage sites.³

Mussel seed are sourced from subtidal beds that in general lie below the diving depth of most diving birds (below 20 metres). Bivalves, including mussels are a feature of the diet of birds within the bays where mussel cultivation is practised, in both jurisdictions. It could be argued that bird populations may benefit from the presence of bottom mussel culture. Cultivation does not tend to take place at shallow depths to allow any real opportunity to feed but, in certain locations such as Cromane, the practice of inter-tidal re-laying may provide for such circumstances. The only subtidal bivalve feeders in the above list that may benefit from the presence of bottom mussel culture are the diving ducks (Common Scoter, Eider).

The list of the Northern Ireland priority species under the UK Biodiversity Action Plan do not consider bottom mussel culture to be among the threats for any species. There are, however, several possible species for which bottom mussel cultivation may interact with; the Tube Worm *Sabellaria spinolusa*, the Horse Mussel, *Modiolus modiolus* within offshore seed collection sites and the Sea Pen *Virgularia mirabilis* and the Lagoon Cockle *Cerastoderma glaucum* at cultivation sites.⁴

The results of the bycatch sampling in 2016 in Irish waters have shown that no ETP species have been identified in the seed beds and harvest areas (Table 7).

³ http://www.doeni.gov.uk/niea/protected_areas_home.htm

⁴ MJ Kaiser, KR Clarke, H Hinz, MCV Austen, PJ Somerfield, I Karakakkis 2006 Global analysis of response and recovery of benthic biota to fishing Marine Ecology Progress Series 311.

3.4.6. Habitats

Habitats in this instance represents the habitats within which the fishery operates.

The main potential impact on habitats by this fishery occurs during dredging for seed and through the laying of mussel beds over the cultivation areas. The impact of towed fishing gear upon habitats is dependent on the type of substratum and the configuration of the fishing gear. Impacts are greater in stable habitats that are not exposed to natural disturbances from tidal currents and waves generated by storms. In contrast areas that experience high natural disturbance tend to harbour fauna that is adapted to physical disturbance and therefore these habitats tend to be less sensitive to fishing disturbance. The impact of different fishing gears largely depends on their configuration and the way they are operated.⁵

The vast majority of seed mussel is extracted from ephemeral beds that are found in high energy environments (i.e. areas characterised by strong tidal currents). Thus fishing intensity is directed within the exact area where the bed has been identified. Whilst the fishery will affect the seed mussel habitat and annual re-occurrence of seed in the vicinity will result in repeat fisheries due to the high energy environments they occur in, recovery time to a pre-mussel bed condition is considered to occur within several months and most likely modified naturally (e.g. by winter conditions). If not fished, sub-tidal mussel beds tend to recess naturally due to density dependant effects (i.e. food shortage due to too high seed density), washed out by winter storms or predation by starfish, urchins and crabs.

Where extensive fisheries occur, the depletion of wild seed stocks may have an effect on the trophic interaction within the system⁶. In the Northern Ireland Skullmartin mussel seed bed, a study covering two seed fishing seasons concluded that there appears to be no long term impact of dredging on the biodiversity of the bed⁷.

Mussel seed dredging⁸ involves the removal of mussels from the underlying substrate. Mussels are filter feeders; that is, they derive their nutrition by filtering naturally occurring particulate matter from the water. Mussels will then excrete undigested waste matter or digested faecal matter from their body cavity. This faecal matter (pseudofaeces) quickly accumulates and develops into a layer of mud (known as 'mussel mud'). To harvest the animals, the mussel dredge tows through this mussel mud and thus does not invade the original sea floor.

There is extensive information available regarding benthic habitats around the island of Ireland. The most complete and up-to-date record can be found online at <http://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/>, an excerpt from which is presented in Figure 6 below.

⁵ Hinz H, Murray LG, Malcolm FR, Kaiser, MJ 2012 The environmental impacts of three different queen scallop (*Aequipecten opercularis*) fishing gears. *Marine Environmental Research*. 73: 85–95

⁶ Kaiser, M., I. Laing, S. Utting, and G. M. Burnell, 1998. Environmental impact of bivalve mariculture. *Journal of Shellfish Research*. 17: 58-66

⁷ McMinn, C.L, 2007. Sustainable management of *Mytilus edulis* seed resources in Northern Ireland. PhD thesis.pp176.

⁸ Maguire, JA, T Knights, G Burnell, T Crowe, F O'Beirn, D McGrath, M Ferns, N McDonough, N McQuaid, B O'Connor, R Doyle, C Newell, R Seed, A Small, T O'Carroll, L Watson, J Dennis, and M O'Cinneide, 2007. 'Management Recommendations for the sustainable exploitation of mussel seed in the Irish Sea'. *Marine Environment and Health Series*. 3.1.

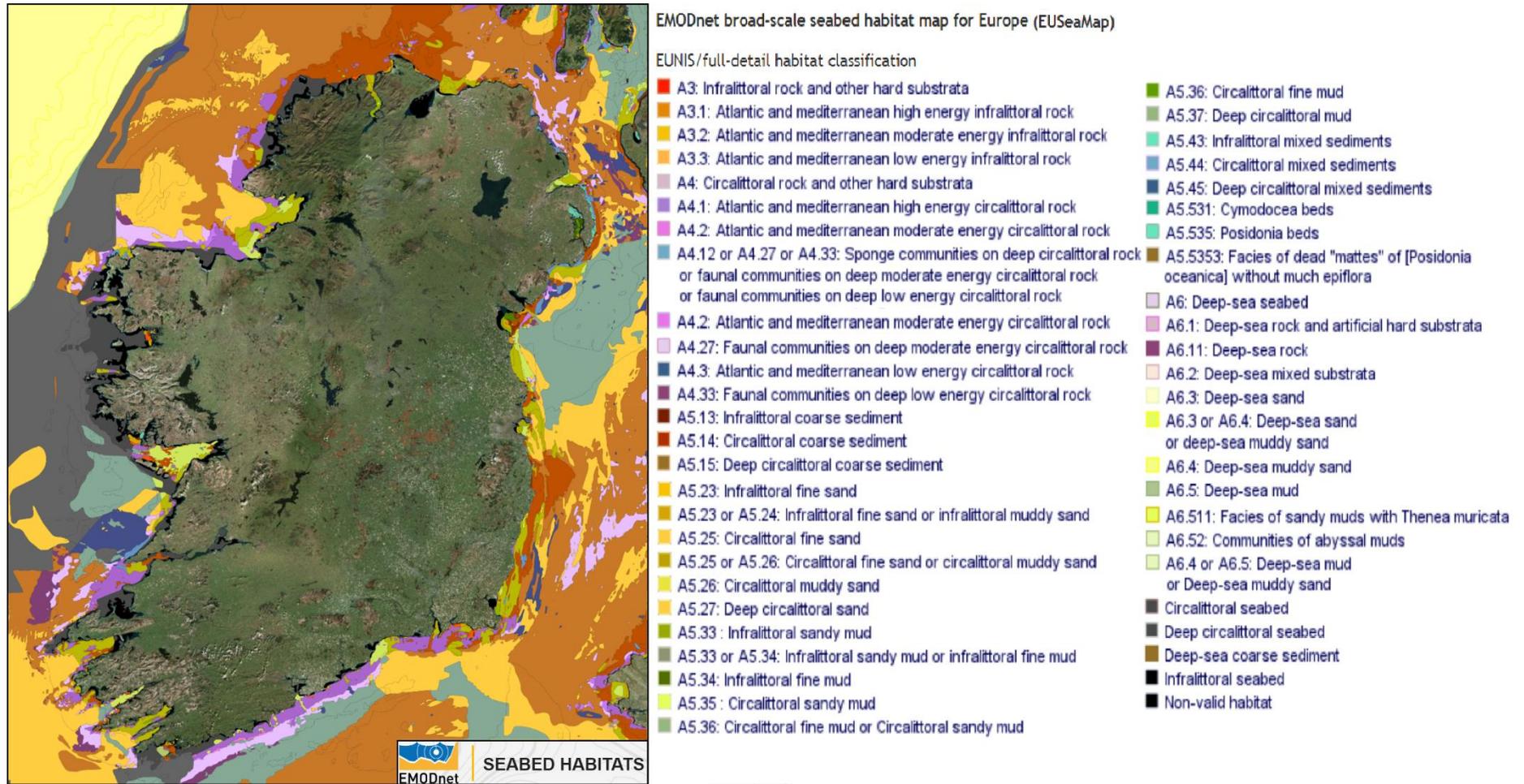


Figure 6. Habitats around the island of Ireland based on EUNIS habitat classifications (Source: <http://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/>).

Habitat Designations

In both IE and NI habitat features may be protected under European Natura 2000 legislation. Specifically, Special Areas of Conservation designations, SAC designations⁹ are based on broad habitat categorisations. Mussel seed and finished product dredging may affect the benthic habitat. Benthic habitat and community structure are assessed through site-specific management plans. Until a site has undergone a test of significance/screening and an Appropriate Assessment if required, fishing is closed for seed mussel in these areas. Some plans have been implemented, such as for Castlemaine¹⁰, and others will be available in the future via the Road Map to Compliance of Fisheries and Aquaculture Activities in Natura 2000 sites¹¹. Special Area of Protection, SPA designations are based on the presence of nationally or internationally important populations of particular bird species.

SACs are selected for the conservation and protection of habitats listed on Annex I and species (other than birds) listed on Annex II of the Habitats Directive, and their habitats. The habitats on Annex I require special conservation measures because they are under threat in the EU and because much of the global resource of the habitat occurs within the EU. A subset of these, Annex I priority habitats, are threatened with disappearance and, accordingly, merit special conservation measures. IE has examples of 59 Annex I habitat types and 16 of these are or may be priority types. Ireland supports 26 Annex II species: 6 mammals, 8 fish, 7 invertebrates, and 5 plants, these are species that are threatened in the EU and for which SACs must be designated. There are at present no priority species in Ireland¹². Other species are listed for protection measures on Annex IV and V, and some species (such as the otter) are included on more than one annex.

Within Northern Ireland, subtidal blue mussel beds are a component habitat of several potential Marine Conservation Zone habitats including sublittoral biogenic reefs, sublittoral muds and sublittoral sand¹³. There are 58 SACs, SCIs or cSACs in Northern Ireland¹⁴. In NI, SACs in terrestrial areas and marine areas out to 12 nautical miles are designated under the Conservation (Natural Habitats) Regulations 1994. Protection of the marine environment requires cross-government cooperation involving DAERA, DOE, EHS and also Defra on measures to protect the local marine environment and to deliver UK fisheries marine environmental policy. Examples of Annex I habitat types and Annex II species are listed together with those found elsewhere in the UK. There are at present no priority species in Northern Ireland. Again other species are listed for protection measures on Annex IV and V, and some species (such as the otter) are included on more than one annex.¹⁵

SACs and SPAs in Northern Ireland and Ireland are presented in Figure 7 below; note for clarity areas that fall outside the inshore waters of both Jurisdiction s (i.e. outside the UoA) are excluded for the sake of clarity. Areas may also be designated as Marine Conservation Zones (MCZs) and Marine Nature Reserves (MNRs). Extensive information is freely available online through various online map viewers:

- Northern Ireland: <https://apps.d.daera-ni.gov.uk/nedmapviewer/>
- Rest of UK: <http://jncc.defra.gov.uk/page-5201>
- Republic of Ireland: <http://atlas.marine.ie>

⁹ NPWS website www.npws.ie, DOE website <http://www.doeni.gov.uk/niea/index.htm>

¹⁰ Finalised Fisheries Natura Plan 2011 – 2016 available on <http://www.fishingnet.ie/>.

¹¹ A Road map to the management of Fisheries and Aquaculture Activities in Natura 2000 sites in Ireland, 2009.

¹² Format For A Prioritised Action Framework (PAF) For Natura 2000 For the EU Multiannual Financing Period 2014-2020 Ireland https://www.npws.ie/sites/default/files/publications/pdf/IE_PAF_draft_1.1_Jan2013.pdf

¹³ DOE (2014). Guidance on selection and designation of Marine Conservation Zones (MCZs) in the Northern Ireland Inshore Region"

¹⁴ http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_list.asp?Country=NI

¹⁵ <http://jncc.defra.gov.uk/page-1523>



Figure 7. SACs and SPAs around the island of Ireland. Note some sites may have more than one designation. Areas that occur entirely outside of the UoA have been excluded for clarity. The light gray area off the east coast of Northern Ireland is a candidate SAC (cSAC) (Source: <http://atlas.marine.ie> and <https://apps.d.daera-ni.gov.uk/nedmapviewer/>).

Sensitive Habitats in Irish Waters

Non-biogenic and biogenic reefs

Reefs may have a rocky substrate (non-biogenic reefs) or be constructed by animals (biogenic reefs)¹⁶. The shallowest reefs are intertidal, including honeycomb reefs made by the polychaete worm *Sabellaria alveolata* and reefs made by the mussel *Mytilus edulis*. Sublittoral biogenic reefs on the Island of Ireland include:

¹⁶ NPWS website www.npws.ie

Sabellaria Reefs

These are constructed by the polychaete worm *Sabellaria spinulosa*, except at Wicklow Head where the subtidal reef is recorded as being constructed by *S. alveolata*. The reefs are constructed of sand grains by the worm and form a substrate for many other species that would not normally be present in the area in the absence of the reefs. The reefs can be up to a metre in thickness.

While the reef-forming polychaete *S. alveolata* has been recorded off the Wicklow coast in the past, and Wicklow Reef SAC was designated inter alia for this feature, it appears that its occurrence within this site may be questionable. Current knowledge suggests that the highly dynamic nature of this area is unlikely to support a stable biogenic reef composed of *S. alveolata* for any length of time¹⁷.

Currently there are no designated Sabellaria Reefs in Northern Ireland. *S. spinulosa* reefs have been recorded from all European coasts except the Baltic Sea, Skagerrak and Kattegat. Not all of these aggregations could be described as “reefs”, for instance where the species may only form superficial crusts on mixed substrata.¹⁸

Bivalve Reefs

Modiolus modiolus reefs occur in two physical forms semi infaunal reefs and infaunal gravel embedded reefs community which can form wave like mounds up to 1 metre high. Reported that it could be quite extensive off the Ards peninsula with small areas also reported in Carlingford Lough and at Portrush (Erwin *et al.*, 1986 in Holt *et al.*, 1998)-these have not been substantiated as true biogenic reefs. On the southern tip of the Codling Bank off the Wicklow coast a gravel embedded type of modiolus bed was located in 1997 INTERREGG project. Beds of horse mussels *Modiolus modiolus* form extensive biogenic reefs within the central portion of Strangford Lough, which is outside the scope of this assessment.

¹⁷https://www.npws.ie/sites/default/files/publications/pdf/002274_Wicklow%20Reef%20SAC%20Marine%20Supporting%20Doc_V1.pdf

¹⁸ http://qsr2010.ospar.org/media/assessments/Species/p0010_supplements/CH10_04_Sabellaria_spinulosa.pdf

3.4.7. Ecosystems

Ecosystem in this instance represents the broader ecosystem elements such as trophic structure and function, community composition, and biodiversity.

To clarify the difference between the Ecosystem component and other components. In general:

- the Ecosystem component establishes the performance against which to assess the indirect impacts of fishing on the wider ecosystem;
- the Retained species, Bycatch species and Habitats components establish the performance against which to assess the direct impacts of fishing on those components of the ecosystem;
- the ETP component considers both indirect and direct impacts.

There are two potential impacts of this fishery that may interfere with the functioning of ecosystems. a) The removal of seed mussels from offshore ecosystems and b) the introduction of this seed to enclosed bay environments for cultivation. The mussel fishery on the island of Ireland exploits ephemeral beds in high energy environments and therefore the impact of the fishery on associated species and the functioning of offshore ecosystems is likely to be limited. In general sub-tidal mussel seed beds on the island of Ireland are located below 20 metres and therefore will have little to no impact on diving birds¹⁹.

The introduction of mussel seed into enclosed bay environments for cultivation may have positive and negative effects for the local ecosystem. Positive effects can be expected due to a surplus of food in the form of mussels for local bird populations or benthic invertebrates²⁰. Some benefits may also be evident in sub tidal mussel cultures with respect to diving birds. Negative effects may be expected due to the changes in habitat (changing soft sediment habitats into mussel beds see discussion on habitats above) and due to the overstocking of mussels in enclosed bay ecosystems limiting the carrying capacity of these bays for other species. In other words there may be a net loss of energy to other ecosystem components through the competition of mussels for phytoplankton. The effect of this phytoplankton depletion will vary hugely depending on nutrient inputs, flushing times, season and dependent biomass. This potentially large impact of mussel culture on the ecosystem could conflict with other important functions of the system, such as foraging and breeding success of certain birds or affect nursery and feeding areas for fish.

To address the questions over the carrying capacity of individual bays that could inform about sustainable stocking densities as well as any potential consequences to other ecosystem components NI and IE both commissioned modelling studies of carrying capacities (**SMILE and UISCE Projects**) taking into account local conditions at cultivation sites). The SMILE model has been maintained and developed as aquaculture production and ecosystem management tool. Fisheries Division of DAERA provides shellfish input and export data supplied by the industry. The input data is used to simulate shellfish harvest, density dependent impacts have been observed in the model and this information could help inform the producer of optimal stocking densities for their sites. Export data from the shellfish production areas is used to validate the model results.

A large dataset has been gathered in coastal areas in compliance with the European Union's **Water Framework Directive** (EC, 2000) which ranks areas under a range of Ecological carrying capacity indicators with five resulting status classes: high, good, moderate, poor and bad. Results from the WFD monitoring show that many estuaries and sea loughs suffer from eutrophication, in which excess nutrients entering waterways can trigger massive blooms of phytoplankton and other algae. Phytoplankton blooms reduce water clarity and

¹⁹ Maguire, JA, T Knights, G Burnell, T Crowe, F O'Beirn, D McGrath, M Ferns, N McDonough, N McQuaid, B O'Connor, R Doyle, C Newell, R Seed, A Small, T O'Carroll, L Watson, J Dennis, and M O'Conneide, 2007. 'Management Recommendations for the sustainable exploitation of mussel seed in the Irish Sea'. *Marine Environment and Health Series*. 3.1.

²⁰ Caldow RWG, Beadman HA, McGoroty S, Kaiser MJ, Gross-Custard JD, Mould K and Wilson A, 2003 Effects of intertidal mussel cultivation on bird assemblages. *Marine Ecology Progress Series* 259, 173-184.

deplete the water of oxygen as they die and decompose. Bivalves such as mussels can reduce excessive growth of phytoplankton and, at high density, can counteract symptoms of eutrophication, thereby improving local, water quality. Augmenting suspension-feeding bivalves through aquaculture has the potential to enhance suspension-feeding activity and controls in systems where natural populations have been depleted.

The **Birds and Habitats Directives** set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the Natura 2000 sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project including aquaculture licencing on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as “Appropriate assessments” in Ireland and as a “Test of Significance” in NI.

Currently due to the shortage of seed most bays are far from working anywhere near full capacity.

3.4.8. Translocation

The movement of mussel seed and the introduction of alien species into areas with significant mussel culture is an issue of serious ecological concern.

Relocation of seed mussels to the on-growing sites will change these habitats from areas dominated by soft sediments to mussel beds. The presence of these beds will also change local hydrodynamics over the on-growing site. Similarly, the feeding behaviour and excretion of pseudofaeces results in the formation of mussel-mud within the on-growing sites which will settle on top of the original seabed. These changes will cause a shift in benthic communities from natural soft sediment communities, towards species associated with mussel beds²¹. Faunistic changes related to the on-growing of mussels are similar to those expected if mussel beds would establish naturally. These changes will predominantly affect the licensed mussel on-growing areas; however effects beyond their boundaries are not anticipated.

A study of the effects of transplanting mussels on species richness has found that these effects are localized (0- 10m) and not detectable at larger distances (10- 100m). Mussels also create a secondary habitat composed of layers of mussel with accumulated sediment faeces, pseudofaeces and shell debris that supports a highly diverse associated community. In the event that the mussel fisheries would for any reason cease, the removal of mussels from cultivation sites is highly likely to result in the restoration of the previous benthic communities and sediment morphology. Soft sediments tend to recover relatively rapidly after disturbance events²² and a restoration to the previous state is expected within a year.

Crepidula fornicata

One potentially important threat to the bottom mussel industry comes from the slipper limpet *Crepidula fornicata*. *Crepidula* is already present in high densities along the south coast of England and round the west coast as far as south Wales. It has not been mapped in IE waters so far, but authorities (IE and NI) are very aware of the problem and are vigilant, as far as is possible. In practice, very little seed comes into the island of Ireland from *Crepidula* areas, since English and Welsh authorities generally only give permission to collect seed if the business in question has beds in England or Wales, and only a few businesses have beds in Wales and on the island of Ireland. Unfortunately, *Crepidula* can also be transported on ship hulls and via ballast water as well as by natural spread, so vigilance in managing shipments of shellfish cannot by itself eliminate the risk of introduction, but it may likely reduce it significantly.

²¹ Beadman HA, 2004. Ecological impact of mussel culture in the Menai Strait, North Wales, PhD thesis, University of Wales, Bangor.

²² Dornie, K. M., Kaiser, M. J. and Warwick, R. M. (2003), Recovery rates of benthic communities following physical disturbance. *Journal of Animal Ecology*, 72: 1043–1056. doi: 10.1046/j.1365-2656.2003.00775.

Didemnum

Didemnum is a colonial sea squirt forming extensive sheets overgrowing a variety of substrates and attached organisms and is known as an invasive species in Ireland. It has so far been found in Ireland in two marinas (in Malahide and Carlingford) suggesting that it was brought in on the hulls of yachts. It is of concern to bottom mussel culture in particular since it can cause extensive fouling.

Undaria pinnatifida

There is also concern about the macroalgal species *Undaria pinnatifida* which was introduced to Europe in imported oyster spat from East Asia, and secondarily on to the south coast of England on boat traffic from France. It seems likely that, as with *Didemnum*, recreational yachting is the most likely future route of introduction of the species into Ireland. The infected area largely coincides, or is contained within, the area infected by *Crepidula*; it may be worth preventing the import of mussel seed from this area (English Channel, northwest France) except under exceptional circumstances.

3.5. Principle Three: Management System Background

3.5.1. The Legislative Framework

Principle 3 of the Marine Stewardship Council standard states that:

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

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

The regulatory framework for the BG mussel sector includes; the Voisinage Agreement; the Common Fisheries Policy and associated EU legislation; the Fisheries Amendment Act 2003 (IE legislation) and the Sea Fisheries & Maritime Jurisdiction Act 2006 as amended (IE legislation); the Fisheries Act (Northern Ireland) 1966, as amended (NI legislation); Sea Fisheries Act 1968 and the Sea Fish (Conservation) Act 1967, as amended (UK legislation) and the Foyle and Carlingford Fisheries Order 2007. The management framework includes the following regulatory instruments:

- The Common Fisheries Policy and associated EU legislation;
- The Fisheries Amendment Act 2003 (IE legislation)
- The Fisheries Act (Northern Ireland) 1966

3.5.1.1. EU

The UK and the Republic of Ireland are Member States of the European Union, and their fisheries are subject to the principles and practices of the Common Fisheries Policy. The CFP was reformed in 2013 under the Irish Presidency of the EU.

This regulation sets out the strategic aims of the CFP and enabling the Council of Ministers, or in certain cases the Commission, to make more detailed Regulations. These include ones dealing with control requirements, fleet structure, technical conservation, marketing, funding and annual Total Allowable Catches (TAC) etc. Outside the CFP framework other EU legislation dealing with habitats and species protection is also relevant to fisheries management and to fishermen (e.g. Habitats and Birds Directives).

UK planned exit of the EU:

The UK is planning on leaving the European Union and has begun negotiations for this withdrawal. This withdrawal will include removing the UK from the EU Common Fishery Policy. Until the UK formally leaves, the CFP and all legislation which governs this fishery under re-assessment remain in force.

3.5.1.2. National

The IE Department of Agriculture, Food and Marine (DAFM) is the main fisheries management body in Ireland. They represent Irish fisheries interests within the EU and at the coastal states. DAFM is also responsible for dividing resource allocations among the Irish fleet, and monitoring uptake of resource allocation. In addition DAFM provide corporate governance for the Marine Institute, the Sea Fisheries Protection Agency and BIM (see below for descriptions).

Implementation of the CFP at a national level is carried out through the individual Member States. Member States' fisheries enforcement authorities co-operate in policing the fishery (e.g. satellite monitoring, landing recording etc.). National fisheries administrations are responsible for a range of management and regulatory duties, including management of fleet activity, management of national resource allocation, monitoring and control of all fisheries occurring within national jurisdiction, collection, collation and transmitting of key fishery data, and undertaking at least a base range of scientific monitoring and development work.

The NI Department of Agriculture, Environment and Rural Affairs (DAERA) is the main fisheries management body in Northern Ireland. They represent NI fisheries interests within the EU and at the coastal states. DAERA is also responsible for dividing resource allocations among the NI fleet, and monitoring uptake of resource allocation. In addition DAERA provides corporate governance for AFBI and the Sea Fisheries Inspectorate NI. The Fisheries Act (Northern Ireland) 1966, as amended (NI legislation); Sea Fisheries Act 1968 and the Sea Fish (Conservation) Act 1967, as amended (UK legislation), provide the basis for the regulatory framework in Northern Ireland.

All vessels involved in fishing and reseeded of mussels must satisfy the licensing and registration requirements of DAFM or DAERA as appropriate. The UK register includes Northern Ireland vessels. Historically UK registered dredgers with a proven Northern Ireland economic link were permitted to fish in Republic of Ireland waters under the Vosinage Agreement; however, this is no currently the case (see below).

Voisinage Agreement

The Voisinage Agreement is a reciprocal arrangement between IE and NI whereby vessels can fish within the 0 – 6 mile limits in either jurisdiction. This has been a traditional arrangement since the London Fisheries Convention of 1964. A legal case taken by a number of members of the Irish Fishing Industry (2016) found that this arrangement did not have sufficient basis in law. As a result Northern Irish vessels cannot currently fish in Republic of Ireland waters. The legal case had no implications for Republic of Ireland vessels as they are still currently permitted to fish in Northern Ireland waters under the original arrangement. A bill to make provision in law for Northern Irish vessels to fish in Republic of Ireland waters (i.e. to give the Vosinage Agreement sufficient basis in law) has been cleared by the Irish Government and is currently in committee stage (Feb 2018).

Legislation governing movement of shellfish

Dredging of mussel seed by Irish registered vessels and relaying of the seed for the purposes of on-growing within the exclusive fishery limits of the Republic of Ireland may take place only on issue of a licence under the Mussel Seed (Conservation of Stocks) Order 1987, (S.I. No. 118 of 1987) as amended by the Mussel Seed (Conservation and Rational Exploitation) Order 2003 (S.I. No. 241 of 2003). Such licences are issued by DAFM.

In Northern Ireland, dredging and movement of seed mussels is controlled by means of a licence granted by DAERA under the Sea Fish Conservation Act 1967. In Northern Ireland under the Molluscan Shellfish (Control of Deposit) Order (Northern Ireland) (SR 1972 No 9) mussel seed imported from outside Northern Irish waters can only be reseeded under the authority of a permit granted by DAERA.

Notification of intention to fish for mussel seed must be given to the relevant Department at least 24 hours in advance of commencement of fishing activity. Notification must include the name of the vessel, name of skipper/owner, contact telephone number, intended zone of operation and intended duration of operation. Compliance with inspection procedures and provision of logbook information will be included as licence conditions.

All movements of mussel stocks for on-growing/reseeding must comply with any national and EU fish health legislation currently in force and must be accompanied by the appropriate health certification.

3.5.2. Roles & Responsibilities

There are several relevant organisations and agencies which take an active role in the fishery under re-assessment. Their roles are explicitly defined and well understood, and the interaction between them works effectively.

3.5.2.1. Scientific Advice

Bord Iascaigh Mhara (BIM), Irish Sea Fisheries Board

BIM was established under the Sea Fisheries Act 1952 and is the Irish State agency with responsibility for developing the Irish sea fishing and aquaculture industries. A primary objective of BIM policy is to expand the volume, quality and value of output from these sectors, on a sustainable basis. BIM provide support to the industry through survey activities on seed mussel beds and in on-growing bays. BIM also have a role in training, financially supporting targeted activities (grant aid) and advising the competent authorities on fisheries.

Marine Institute, Ireland

The Marine Institute is Ireland's national agency established under the Marine Institute Act, 1991, "to undertake, to co-ordinate, to promote and to assist in marine research and development and to provide such services related to marine research and development, that in the opinion of the Institute will promote economic development and create employment and protect the environment."

Ireland has an established and comprehensive system of environmental and food safety monitoring for the aquaculture industry which meets EU and market demands. For example, Shellfish production areas are classified by the Sea Fisheries Protection Authority (SFPA) based on the monitoring results of shellfish for bacterial contamination and in accordance with the terms of EU regulations. The Marine Institute, as the National Reference Laboratory, operates a virus testing facility and can undertake virus testing either for surveillance purposes, or in response to outbreak investigations at the request of the SFPA or the Food Safety Authority of Ireland.

Agri-Food & Biosciences Institute (AFBI), Northern Ireland

The Agri-Food & Biosciences Institute (AFBI) was created on 1st April 2006 as an amalgamation of the Department of Agriculture and Rural Development (DARD, now DAERA) Science Service and the Agricultural Research Institute of Northern Ireland (ARINI). AFBI is a DAERA Non-Departmental Public Body (NDPB). AFBI carries out high technology research and development, statutory, analytical, and diagnostic testing functions for DARD and other Government departments, public bodies and commercial companies.

Food Standards Agency, Northern Ireland

The Food Standards Agency NI (FSA in NI) is responsible for carrying out monitoring of classified production areas for their microbiological status, the presence of phytoplankton in samples of water, marine biotoxins and chemical contaminants in samples of shellfish flesh. This monitoring programme is carried out in conjunction with the Loughs Agency, DAERA, district councils and the Public Health Laboratory at Belfast City Hospital.

3.5.2.2. Departments and Agencies

Republic of Ireland

Department of Agriculture, Food and the Marine (DAFM)

The Irish Government's Department of Agriculture, Food and the Marine (DAFM) is the main fisheries management body in IE. Their responsibilities are divided into the following sections:

Seafood Policy and Development

The Seafood Policy & Development Division is responsible for the strategic, economic and sustainable development of the seafood sector, as well as the broad regulation of it, within the framework of the Common Fisheries Policy, the Sea-fisheries and Maritime Jurisdiction Act 2006 and the Fisheries (Amendment) Act 2003.

The Division's overall goal is to implement national policies, negotiated within the Common Fisheries Policy, that support a long term sustainable seafood industry for Ireland, and to maximise the long term contribution of the seafood industry to the economies of coastal regions. With the key functions of the Division being to:

- Negotiate fisheries policy at EU level that supports a strong seafood sector in Ireland
- Promote development of the seafood sector
- Implement effective management of Ireland's fishing resources

The Aquaculture & Foreshore Management Division

The Aquaculture & Foreshore Management Division ensures the efficient and effective management of Aquaculture and Foreshore licensing in respect of Aquaculture and Sea Fishery related activities.

The Strategic Objectives of the Aquaculture & Foreshore Management Division are:

- to develop and manage an efficient and effective regulatory framework in respect of Aquaculture licensing and Foreshore licensing of Aquaculture and Sea Fishery related activities;
- to secure a fair financial return from the State's foreshore estate in the context of Aquaculture licensing and Foreshore licensing in respect of Aquaculture and Sea Fishery related activities;
- to progressively reduce arrears in the clearing of licence applications.

Marine Agencies & Programmes Division

The responsibilities of Marine Agencies & Programmes Division are very diverse but include;

- Inshore Fisheries Policy
- Seafood Development Policy
- Aquaculture Policy
- Seafood Safety, Fish Health, Fish Movement, Loughs Agency & Marine Tourism
- Integrated Maritime Policy
- Corporate governance of marine agencies

In relation to the bottom grown mussel sector the Division has responsibility for regulation of mussel seed fishing, as part of its inshore fisheries policy brief. Also relevant is its responsibility for policy for the development of the seafood sector generally and its role as Managing Authority for the Seafood Development Operational Programme, which provides financial support for development of the mussel farming industry, under the EMFF.

Department of, Housing Planning and Local Government, Ireland

This Department has jurisdiction for planning landwards from the mean high water mark (MHWM) and also for certain activities on the foreshore, such as marina development and seaweed harvesting. It is primarily responsible for securing and implementing environmental legislation, co-ordinating Irish policies on environmental matters and presenting these to the E.U.

The Department has responsibilities under National and European law for the protection, conservation, management and preservation of Ireland's natural heritage. In order to carry out this brief it oversees the National Parks and Wildlife Service (NPWS), which has responsibility for nature conservation and habitat protection under the 1976 Wildlife Act, the Habitats Directive (92/43/EEC) and the Birds Directive (85/337/EEC).

Aquaculture Licence Appeals Board (ALAB)

The Appeals procedure for aquaculture licensing is handled by the independent Aquaculture Licences Appeals Board, established on 17 June 1998 under Section 22 of the Fisheries (Amendment) Act, 1997. All Board members are engaged on a part-time basis. Customers, the public or environmental organisations aggrieved by a decision of the Minister for Agriculture, Food and the Marine on an aquaculture licence application, or by the revocation or amendment of an aquaculture licence, may make an appeal within one month of publication (in the case of a decision) or notification (in the case of revocation/amendment).

The Aquaculture Licensing Section of the Aquaculture & Foreshore Management Division co-ordinates processing and monitoring of licences for all shellfish, Marine finfish, Land based Fin Fish, Cultivation of aquatic plants e.g. seaweed. Aquaculture licence applications may be subject to environmental assessments under the Natural Habitats Regulations if located within or close to Natura 2000 conservation sites.

Food Safety Authority of Ireland (FSAI)

The Food Safety Authority of Ireland was established under the Food Safety Authority of Ireland Act, 1998. The Act was enacted in July 1998 and came into effect on 01 January 1999. The principal function of the Food Safety Authority of Ireland (FSAI) is to take all reasonable steps to ensure that food produced, distributed or marketed in the State meets the highest standards of food safety and hygiene reasonably available and to ensure that food complies with legal requirements, or where appropriate, with recognised codes of good practice.

The Authority is a statutory, independent and science-based body, dedicated to protecting public health and consumer interests in the area of food safety and hygiene. It comes under the aegis of the Minister for Health and Children and currently has a board of ten. It also has a 15 member Scientific Committee that assists and advises the Board. Therefore, decisions relating to food safety and hygiene take account of the latest and best scientific advice and information available.

FSAI has national responsibility for co-ordinating the enforcement of food safety legislation in Ireland. The FSAI is responsible for:

- Putting consumer interests first and foremost
- Providing advice to Ministers, regulators, the food industry and consumers on food safety issues
- Ensuring the co-ordinated and seamless delivery of food safety services to an agreed high standard by the various state agencies involved
- Ensuring that food complies with legal requirements, or where appropriate, with recognised codes of good practice
- Working with the food industry to gain their commitment in the production of safe food
- Setting food standards based on sound science and risk assessment
- Risk management in association with frontline agencies and the food sector, and communicating risks to consumers, public health professionals and the food industry.

Industry Representation

The Irish Farmers Association Aquaculture Section (IFA – Aquaculture, incorporating the Irish Shellfish Association (ISA)) is part of the Irish Farmers Association, the representative body for farmers in Ireland. The ISA has an Executive, a Board and represents a large proportion of the bottom mussel industry.

Northern Ireland

Department of Agriculture, Environment and Rural Affairs (DAERA)

DAERA is responsible for:

- Sea fisheries policy for the conservation and protection of sea fisheries including enforcement of EU and national legislation;
- Collection, validation and processing of sea fisheries landing data, and administration of the UK Fishing Vessels Restrictive Licensing Scheme;
- Aquaculture policy and the assessment and licensing of all marine and land based fish farms;
- Implementation of EU legislation on fish health and control of fish diseases, enforcing fish health legislative requirements, submitting fish samples to the Fish Disease Unit of DARD's Science Service, and providing advice to angling clubs and licensed fish farmers;
- Administration of all EU and national grants to the sea fishing and aquaculture industries.

The Fisheries Division is subject to the overall direction and control of the Minister responsible for DAERA. DAERA is responsible for the Foyle, Carlingford and Irish Lights Commission, the Northern Ireland Fishery Harbour Authority and the Sea Fish Industry Authority.

- Environment and Heritage Service (EHS)
- Natural Heritage
- Built Heritage
- Environmental Protection
- Environmental Policy Division (EPD)
- Planning Service

Department for Infrastructure (DOI)

The Department for Infrastructure has the aim to improve the quality of life for everyone in Northern Ireland by maintaining and enhancing a range of essential infrastructure services and by shaping the region's long-term strategic development. It is responsible for a wide range of services including ports policy, roads and water policy and providing and maintaining water and sewerage services.

The Water Appeals Commission (WAC)

The Water Appeals Commission (WAC) was established in 1973 and presently consists of the Chief Commissioner, Deputy Chief Commissioner and all other full-time Commissioners of the Planning Appeals Commission. Its proceedings are governed by The Water and Sewerage Services (NI) Order 1973 as amended, although there are no detailed procedural rules to be followed. The WAC currently has 7 functions under this legislation, 11 functions under the Water (NI) Order 1999 as amended, 4 functions under the Water and Sewerage Regulations (NI) 1973, 3 functions under the Drainage (NI) Order 1973, 3 functions under the Drainage (Environmental Impact Assessment) Regulations (NI) 2001, 11 functions under the Fisheries Act (NI) 1966, and 3 functions under other legislation.

3.5.2.3. All Island/Cross-border bodies

Loughs Agency

The Loughs Agency is an agency of the Foyle, Carlingford and Irish Lights Commission (FCILC), established as one of the cross-border bodies under the 1998 Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of Ireland. The Agency aims to provide sustainable social, economic and environmental benefits through the effective conservation, management, promotion and development of the fisheries and marine resources of the Foyle and Carlingford Areas. Under the Agreement, the Agency took over the fisheries protection functions of the Foyle Fisheries Commission and was given both an additional cross-border operational area in Carlingford and the additional functions of developing aquaculture and marine tourism. Importantly, for the development of this plan a key role of the Agency is the "Promotion of development of Lough Foyle and Carlingford Lough for commercial and recreational purposes in respect of marine, fishery and aquaculture matters".

The functions of the FCILC in relation to the Foyle and Carlingford Areas are exercised by the Loughs Agency of the FCILC, and are as follows:

- The promotion of development of Lough Foyle and Carlingford Lough for commercial and recreational purposes
- The conservation, protection, management and development of inland fisheries in the Foyle and Carlingford Areas
- Following the enactment of the relevant Irish and Northern Irish legislation, the development and licensing of aquaculture in the Foyle and Carlingford Areas
- The development of marine tourism in Lough Foyle and Carlingford Lough

The FCILC is legislated for by the North/South Co-operation (Implementation Bodies) (NI) Order 1999 and the British-Irish Agreement Act 1999. The FCILC has a Board of 12 members who, in exercising the functions of the Body, are required to act in accordance with any directions given by the North South Ministerial Council (NSMC), to which it also reports.

The Loughs Agency exercises the functions of the Foyle, Carlingford and Irish Lights Commission (FCILC) in relation to the Foyle and Carlingford Areas. These functions include the conservation, protection, management and development of the salmon and inland fisheries of the Foyle and Carlingford Areas, the development of marine tourism, and the promotion of development of Lough Foyle and Carlingford Lough for commercial and recreational purposes. Following the enactment of the necessary legislation, the functions will be extended to include the development and licensing of aquaculture in the Foyle and Carlingford Areas.

The Foyle, Carlingford and Irish Lights Commission (FCILC)

The Foyle, Carlingford and Irish Lights Commission (FCILC) is supported in its operation by DAERA, together with its counterparts in the Department of Communications, Climate Action and Environment (DCCAE) in the Republic of Ireland. The FCILC was established by the agreement between the Government of the United Kingdom and the Government of Ireland establishing North/South Implementation Bodies (1988).

Bottom Grown Mussel Consultative Forum (BGMCF)

The Rising Tide Review, initiated in Autumn 2006 and published in 2008 was carried out by a review group drawn from BIM, DARD (now DAERA), DAFF (now DAFM) and the Loughs Agency, under a Terms of Reference set by the ministers in the two jurisdictions and supported by a Secretariat provided by the Aquaculture Initiative. A major outcome of the review was the formation of the Bottom Grown Mussel Consultative Forum (BGMCF) in 2008.

The BGMCF has become a discussion forum for policy, industry/government consultation for informing ministerial decisions, a clearinghouse for information dissemination and a co-ordinating body to organise necessary industry collective actions. The BGMCF functions as a central point of contact between the industry and the regulators and for the co-ordination of collective activities. The Aquaculture Initiative continues to serve as secretariat to the forum.

Aquaculture Initiative (EEIG)

The Aquaculture Initiative (**EEIG**) is a dedicated support body, committed to playing a leading role in the development of a sustainable aquaculture industry throughout the target area of Northern Ireland and the six border counties of the Republic of Ireland. Established in 1999 by the Department of Agriculture and Rural Development (DARD), Bord Iascaigh Mhara (BIM), Northern Ireland Seafood (NIS) and the Department of Fisheries and Marine (DAFM), the initiative is funded through the Peace and Reconciliation Programme.

The Initiative team advise on financial, technical, strategic and environmental issues, in order to provide effective support to new and existing aquaculture ventures. The Initiative facilitates and promotes the implementation of strategic measures to enable aquaculture to become a competitive and self-sustaining industry.

3.5.3. Control and Enforcement

Sea Fisheries Protection Agency (SFPA)

The SFPA was established on 1st January 2007 and is responsible for all monitoring, control and surveillance (MCS) of fisheries, within the waters of the Republic of Ireland, in conjunction with the Irish Naval Service. As mussels are a non-resource allocation species (non-quota), fully grown mussels located outside licensed aquaculture sites may be fished for consumption by any licensed and registered fishing vessel with the appropriate shellfish gatherer's documentation granted by either the DAFM or the Food Standards Agency (FSA) - in Northern Ireland. However, if mussels are to be re-seeded or on-grown then any movements of stock must be in compliance with relevant National and EU fish health legislation.

The Sea-Fisheries Protection Consultative Committee

The Sea-Fisheries Protection Consultative Committee comprises 14 representatives from the Irish Marine Community. The members of the Committee were appointed under Section 48 of the Sea-Fisheries and Maritime Jurisdiction Act 2006. The committee acts to advise the SFPA and the minister of issues of concern for the seafood industry.

The Northern Ireland Sea Fisheries Inspectorate

The Sea Fisheries Inspectorate is responsible for the enforcement of European Union and national sea fisheries legislation under the Common Fisheries Policy within British sea fisheries limits (out to 200n miles or the medium line between neighbouring countries). The inspectorate co-ordinates surveillance using patrol vessels, aerial and satellite surveillance techniques. Sea Fisheries Officers are located in port offices, and carry out patrols at sea. The Sea Fisheries Inspectorate (DAERA) has contracted the Royal Navy to carry out enforcement at sea. The Northern Ireland Sea Fisheries Inspectorate operates a fishery protection vessel, working mostly inshore, together with a RIB. Sea Fisheries Inspectors and/or DAERA Investigation Branch are also designated enforcement officers under the Food and Environment Protection Act, 1985.

3.5.4. Management Decision Making

The Bottom Grown Mussel Consultation Forum (BGMCF) is responsible for advising on policy relating to the sector and acts as a clearinghouse for information dissemination and a coordinating body to organise necessary industry collective actions. Its main function is to be the central point of contact between industry and the regulators, advising on policy and coordinating the fishery actions such as:

- The coordination of annual seed mussels surveys
- Based on data provided by these seed surveys providing advice on fishing schedules
- The identification and prioritisation of research in the fishery
- Engaging with Fisheries interests
- Secretariat provides relevant data to regulatory authorities

It makes recommendations on:

- Opening dates of fisheries and duration of fishing;

Taking account of:

- Size and condition of seed.
- Suitability of bed;
- Infestation by predators; and
- Windows of opportunity for fishing

It is the responsibility of DAERA/DAFM and their agencies as appropriate, to issue the relevant licences/health certification and to formally notify applicants of decisions. If a situation arises that requires an immediate response from the forum following consultation between the DAERA and DAFM representatives, the forum may make a recommendation that will be recorded and detailed at the subsequent meeting of the BGMCF.

3.5.5. Management Objectives

3.5.5.1. Long-term Objectives

In IE the following objectives have been identified under the Food Harvest 2020, Foodwise 2025 and Harnessing our Ocean Wealth policies and the National Strategic Plan for Sustainable Aquaculture Development:

- Develop and implement a science-based management system for each species and each stage of production.
- Provide dynamic carrying capacity models for each major shellfish bay and pro-actively facilitate the rationalisation of shellfish production sites.
- Promote scale of production (including hatcheries) and processing.
- Strengthen capability and foster international collaboration on shellfish health.
- Improve efficiencies in production by application of technology.
- Improve environmental monitoring and food safety capability in support of the industry.

In NI the overall aim for fisheries management is a fisheries industry that is sustainable, profitable and supports strong local communities, managed effectively as an integral part of coherent policies for the marine environment. Principal objectives are:

- to promote sustainable fisheries consistent with a diverse and resilient marine environment;
- to ensure that fisheries management within the UK is seen as an example of best practice;
- to promote high levels of confidence in the catching sector that lead to long term investment in innovation and technology.

Environmental management of aquaculture (in the form as practised by the Client) is exerted at a number of different levels, including EU and national legislation, bay-level management and site or business specific environmental management.

EU Aquaculture Development Policy

The European Commission (EC) recognises the importance of aquaculture as a key component of the Common Fisheries Policy (CFP) and has developed Strategic Guidelines for the sustainable development of EU aquaculture (EU commission 2013 – 229). The EU Strategy aims to sustainably develop EU aquaculture through:

- Simplifying administrative procedures
- Securing sustainable development and growth of aquaculture through coordinated spatial planning
- Enhancing the competitiveness of EU aquaculture
- Promoting a level playing field for EU operators by exploiting their competitive advantages

Marine Strategy Framework Directive

The MSFD (EU Directive 2008/56/EC) is a strategy for marine environmental protection. MSFD will constitute the environmental pillar of the new EU Maritime Policy and requires Europe's Oceans to achieve "good ecological status". MSFD foresees the creation of "European Marine Regions" and "Sub-Regions" to act as "management units" for its implementation and obliges member states to co-operate on developing the marine strategies for their waters that lie within these regions. Measures to "achieve or maintain good environmental status" must be developed in order to achieve the 2020 targets. MSFD will embrace the ecosystem based approach to managing all human activities in the marine. It will enable a sustainable use of marine goods and services and promote adaptive management of the oceans. It will undergo a 6 year cycle of revision & review and will seek to ensure cooperation between Member States and regional conventions (e.g. OSPAR). The MSFD states that "The Common Fisheries Policy, including in the future reform, should take into account the environmental impacts of fishing and the objectives of this Directive".

Natura 2000 Conservation

Special Areas of Conservation (SACs) are designated by Member States to meet their obligations under the EC Habitats Directive. They are areas which have been identified as best representing the range and variety within the EU of habitats and (non-bird) species listed on Annexes I and II to the Directive.

The Natura 2000 network provides an ecological infrastructure for the protection of sites that are of particular importance for rare, endangered or vulnerable habitats and species within the EU. The Natura 2000 network in Ireland is made up of European Sites which include:

- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Candidate Special Areas of Conservation (cSAC)
- Proposed Special Protection Areas (pSPA).

SACs and SPAs are fully protected by law in Ireland from when the Minister gives notice of his intention to designate the sites. At present, all SACs are candidate SACs. Candidate and proposed sites are included as part of the Natura 2000 network and potential SPAs have the protection from the time when they are identified as meriting consideration for designation.

Water Framework Directive

The purpose of the Water Framework Directive (WFD) is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. It will ensure all aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands meet 'good status' by 2015. The Directive entered into force in December 2000. The WFD was transposed into law in Northern Ireland by the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003 (S.R. 544 of 2003) and in the Republic of Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. 722 of 2003) (as amended by S.I. 413 of 2005 and S.I. 219 of 2006).

3.5.5.2. Fishery Specific Objectives.

Research Objectives

Marine Institute

The Marine Institute is involved in various ongoing nationally and internationally funded aquaculture research projects. Key areas include biotoxin research, disease and parasite control, new species development, and coastal zone management. Research by the Marine Institute and specialist contractors is ongoing to support the appropriate assessments of culture areas in the Republic of Ireland.

AFBI

The mission of the Fisheries and Aquatic Ecosystems Branch is to carry out research and development, monitoring and technology transfer in support of the sustainable management of fisheries and aquatic resources in Northern Ireland. The branch delivers evidence-based science in marine and freshwater environments for a wide range of customers. One of the main objectives of AFBI is to provide the scientific data upon which stock assessments can be performed for marine fish and shellfish species through the ICES forum. These assessments contribute to the scientific advice underlying the formulation of fisheries policy.

BIM

BIM are involved in aquaculture research capacity/capabilities. Although primarily research funding and development agencies—e.g. providing grants towards the cost of feasibility studies and commercial trials on new species development, technology transfer and opening up of new locations for aquaculture. BIM is involved in aquaculture research with Irish and international partners.

BLUEFISH Project

Bluefish is an EU project funded under the Ireland:Wales programme. The project aims to develop knowledge and understanding of the marine resources of the Irish Sea and Celtic Seas by addressing knowledge gaps regarding the effects on and potential vulnerability of selected commercial fish and shellfish from predicted climate change. Through the transfer of knowledge, transnational expertise and best practice with respect to study and management of commercial fish, shellfish and aquaculture under a climate change context.

Irish Sea Portal Pilot

The aim of The Pilot is to test the feasibility of a larger project (The Irish Sea Portal (ISP)) which will provide a platform that can meet the requirement for knowledge flow in order to generate growth in fisheries and aquaculture. The Pilot will facilitate the formation of one cluster in order to test the principles of the ISP. This cluster will be focused on a study of juvenile shellfish larvae and seabed settlement. It will explore the siting of potential shellfish seed collection sites and the feasibility of seed collector deployment within the study area. This cluster will broaden understanding of shellfish larvae movement within the Irish Sea and its surrounds followed by larval settlement patterns where they are termed 'seed'.

SMILE PROJECT

The Loughs Agency oversaw the development of Carrying Capacity models for all 5 of the growing bays in Northern Ireland. The models were updated in a further project SMILE 2 and are continually run and upgraded. This work had the following objectives:

- To establish functional models at the loughs scale, describing key environmental variables and processes, aquaculture activities and their interactions;
- To evaluate sustainable carrying capacities for aquaculture in the different loughs, considering interactions between cultivated species, for normal and alternative cultivation practises;
- To examine the effects of overexploitation on key ecological variables;
- To examine bay-scale environmental effects of different culture strategies.

3.5.6. Management Measures

Regulation of the seed mussel fishery

A licence requirement is that vessels are fitted with a black box, which enables complete and continuous tracking, monitored by BIM, DAERA, DAFM and the Loughs Agency. This can be used to assess whether the vessel is, for example, surveying for seed, which is only permitted with approval from DAFM, DAERA or SFPA, or whether it is infringing closed areas. Areas can be closed at any time, if, for example, the seed is considered to be too small or too weak to be suitable for fishing. The seed fishery itself is only open to licensed vessels on neap tides during daylight hours. Vessels can of course only fish up to their seed allocation.

Regulation of seed movement

The movement of seed between jurisdictions (UK, NI and IE) requires a movement order, and inspection by a fisheries officer to ensure that listed diseases are not being inadvertently transferred.

Regulation of bottom mussel culture sites

In the IE, the licensing of areas for bottom mussel culture is carried out by DAFM, but the Department of Housing, Planning and Local Government is a statutory consultee in the process, and can request an appropriate assessment if the areas fall within, or adjacent to a protected area. In NI, mussel beds are licensed by DAERA under a similar system, and the Environment and Heritage Service can request an appropriate assessment.

Cross border management: Carlingford and Foyle

Lough Foyle and Carlingford Lough geographically straddle the borders of Northern Ireland and Ireland and therefore are subject to both jurisdictions. Past experience of regulation in these systems has been markedly different, mainly due to the different shape of the two loughs. Carlingford Lough is relatively linear, with a central channel taken as the border for the purpose of aquaculture licencing, and therefore the two regulatory regimes are able to function independently on each side of the channel. Foyle is subject to no such agreement.

The Loughs Agency is the regulatory and licensing body for these two loughs. The Loughs Agency is an agency of the Foyle, Carlingford and Irish Lights Commission (FCILC), established under the 1998 Agreement between the Government of IE and the Government of the United Kingdom of Great Britain and Northern Ireland.

4. Evaluation Procedure

4.1. Harmonised Fishery Assessment

Certification Bodies assessing fisheries that have areas of overlap are required to ensure consistency of outcomes so as not to undermine the integrity of MSC fishery assessments. MSC FCR v2.0 Annex PB provides guidance for harmonisation where a fishery in assessment overlaps with an already certified fishery or fisheries.

As of March 2018, twelve other *Mytilus edulis* fisheries in the Northwest Atlantic are also MSC certified (see Table 8 below). While these other mussel assessments provide important background information they do not for the most part represent overlapping fisheries with the fishery under assessment here (with the notable exception of the Ireland bottom grown mussel fishery). A description as to why harmonisation is/is not required is provided immediately following the table.

Table 8. MSC certified and in-assessment blue mussel fisheries in the Northeast Atlantic*.

Fishery Name	Status	Harmonisation required?
Schleswig-Holstein blue shell mussel	Certified	No
Limfjord blue shell mussel (rope grown)	Certified	No
Netherlands blue shell mussel	Certified	No
Germany Lower Saxony mussel dredge and mussel culture	Certified	No
SSPO Swedish West Coast Rope Grown mussel	Certified	No
North Menai Strait mussel	Certified	Yes
DFPO Limfjord mussel and cockle	Certified	No
Northern Ireland Bottom Grown mussel	Certified	Yes
DFPO Inner Danish Waters blue shell mussel	Certified	No
Ireland Bottom Grown mussel	Certified	No
Mussel translocation by members of the Vereniging van Importeurs van Schelpdieren into the Oostersch	Certified	No
Shetland & Scottish Mainland Rope Grown mussel Enhanced Fishery	Certified	No

* Correct as of (as of 12th March 2018).

The Northern Ireland Bottom Grown Mussel Fishery (being assessed here) and the Ireland Bottom Grown Mussel Fishery are inextricably linked. The assessment of Principle 1 in this report essentially considers the Northern Ireland and Ireland fisheries as a single entity and there is effective co-management between both Jurisdiction s. As such the results of the Northern Ireland and Ireland Bottom Grown Mussel Fisheries are harmonised across all Principles and Performance Indicators. In addition the *M. edulis* stock featured in this report is likely genetically contiguous with *M. edulis* in the eastern Irish Sea (as considered in the North Menai Strait mussel fishery) and as a result the P1 outcome scores (96.0) are the same for all three fisheries (i.e. the Northern Ireland Bottom Grown mussel, Ireland Bottom Grown mussel and North Menai Strait mussel fisheries).

None of the other ten mussel fisheries listed in Table 8 above have the same seed sources, use the same relaying areas or operate within under the same jurisdiction as the fishery under assessment here. As a result harmonisation between the Northern Ireland Bottom Grown Mussel Fishery (being assessed here) and these fisheries is not required.

4.2. Previous assessments

The Northern Ireland Bottom Grown Mussel Fishery has previously been assessed against the MSC Standard, and was originally certified as sustainable in the July 2013. This report therefore presents the results of the second assessment (i.e. the first re-assessment) of this fishery against the MSC Standard. The original assessment, Addison et al. (2013), was based on the same version of the MSC Certification Requirements and used the same default assessment tree, and so it is possible to directly compare the results of this reassessment with those of the original assessment.

In 2013 the original assessment team concluded that the fishery achieved an overall average score of above 80 for each MSC Principle and scored below 80 against eight Performance Indicators (PIs). Therefore, there were eight conditions raised against the fishery which are detailed in Table 9.

Table 9. Summary of Previous Assessment Conditions.

Condition	PI	Year closed	Justification	
1	There is a need for explicit harvest control rules relating to the timing of harvesting, the viability of harvested seed, and the process by which the fishery may be open or closed. Ideally such explicit harvest control rules should form part of a wider fishery management plan which explicitly states the rationale and assumptions underlying the harvest strategy and the harvest control rules.	1.2.2	Year 3	At the 3 rd surveillance audit the Assessment Team determined that, following the formalisation of management arrangements, clearly defined harvest control rules were in place and being applied in managing the fishery. They were also confident that rules are sufficiently formalised such that they should apply equally in all circumstances and should help ensure consistent outcomes regardless of differing biological, environmental and socioeconomic circumstances. The PI was re-scored and the condition closed.
2	Detailed information on bycatch should be collected over the appropriate spatial and temporal scales, with respect to the extent of fishing activities, to verify existing information on bycatch levels over seed mussel beds as well as over cultivation areas. Following this, a baseline monitoring programme needs to be considered and adopted to ascertain quantitative bycatch data to monitor and confirm the current bycatch impacts from the fishery and in the future.	2.2.3	Year 3	At the 3 rd surveillance audit the assessment team determined that the bycatch monitoring program as implemented was sufficient but also that the continuing implementation of the programme needs to be monitored to ensure that information continues to be gathered enabling management to detect any changes in the nature of bycatch and the risk posed by the fishery to non-target species. The PI was re-scored and the condition closed.
3	A decision process that incorporates a clear management strategy for seed exploitation must be adopted with includes a mechanism that prevents the accidental damage to sensitive habitats, particularly for any new or unsurveyed areas.	2.4.2	Year 3	At the 3 rd surveillance audit the assessment team determined that a strategy had been implemented successfully to ensure that the fishery does not pose a risk to habitat types. The PI was re-scored and the condition closed.
4	A monitoring programme of habitats with respect to seed collection and an assessment of the potential impact of the collection of seed needs to be established and used to inform the management decision process for seed exploitation that prevents the accidental damage to sensitive habitats, particularly for any new or unsurveyed areas.	2.4.3	Year 3	At the 3 rd surveillance audit the assessment team determined that there is a program and measures in place to collect information regarding the impacts of the fishery on habitats and that data collected as a result are sufficient to detect any increase in risk to habitat. The PI was re-scored and the condition closed.

Condition	PI	Year closed	Justification
5 The partial strategy that is in place needs to take into account all available information on the carrying capacity and productivity of individual cultivation bays and have a direct influence on the overall management of the cultivation sites.	2.5.2	Year 4	At the 4 th surveillance audit the assessment team determined that there is a partial strategy in place that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. The PI was re-scored and the condition closed.
6 A procedure or mechanism with a scientific basis for the continued collection of sufficient data that would detect any increase in risk levels to the ecosystem due to changes in current cultivation practices is required. This data should relate to the performance indicator for achieving an 80 score for PI2.5.2 b.	2.5.3	Year 4	At the 4 th surveillance audit the assessment team determined that sufficient data continues to be collected to detect any increase in risk level so as to achieve the Ecosystem Outcome 80 level of performance. The PI was re-scored and the condition closed.
7 The decision making process that set the harvest cap was set on historical information. A formal review of the harvest cap within the definition of a precautionary approach suitable for mussel stock sustainability is required and the precautionary approach to decision making is formally adopted by the management agencies	3.2.2	Year 3	At the 4 th surveillance audit the assessment team determined that the fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives. The PI was re-scored and the condition closed.
8 A research plan that provides the management system with a strategic approach to research and provided reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2 is required.	3.2.4	Year 3	At the 4 th surveillance audit the assessment team determined that there is a research plan that provides management with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2). The PI was re-scored and the condition closed.

All the conditions of certification from the 2013 certification were closed out either during or before the 4th surveillance audit in late-2017. As a result, the fishery enters the reassessment process with no outstanding conditions. After the conditions placed on the fishery during the first certification cycle were closed and the PIs rescored, the overall Principle scores for the fishery were 83.3, 86.1 and 87.8 for P1, P2 and P3 respectively. These scores are generally consistent with the scores attained by the fishery during this re-assessment (i.e. 83.3, 87.2 and 91.4).

The evolution Principle level scores from original certification to re-assessment is presented in Table 10 while the changes to Performance Indicator scores that resulted in changes to the Principle level scores are presented in Table 11 (Note the first two surveillance audits did not result in any changes to PI scores).

Table 10. Evolution of Principle level scores from original certification to re-assessment.

Principle	Cert Cycle 1					Cert Cycle 2
	2013	2014	2015	2016	2017	2018
	Original	Surv 1	Surv 2	Surv 3	Surv 4	Re-assessment
Principle 1 - Target species	81.5	–	–	83.3	83.3	82.7
Principle 2 - Ecosystem	83.1	–	–	84.2	86.1	87.2
Principle 3 - Management	86.3	–	–	86.3	87.8	91.4

Table 11. Evolution of each Performance Indicator from original certification to re-assessment.

Component		Performance Indicator (PI)		Original	Surv 3	Surv 4	Re-assess
P1	Outcome	1.1.1	Stock status	100	100	100	96.0
		1.1.2	Reference Points	80	80	80	80
		1.1.4	Genetic outcome	80	80	80	80
	Management	1.2.1	Harvest strategy	80	80	80	80
		1.2.2	Harvest control rules & tools	65	80	80	80
		1.2.3	Information & monitoring	80	80	80	80
		1.2.4	Assessment of stock status	80	80	80	80
P2	Retained species	2.1.1	Outcome	100	100	100	100
		2.1.2	Management	100	100	100	100
		2.1.3	Information	100	100	100	95
	Bycatch species	2.2.1	Outcome	100	100	100	100
		2.2.2	Management	80	80	80	80
		2.2.3	Information	75	80	80	80
	ETP species	2.3.1	Outcome	80	80	80	100
		2.3.2	Management	80	80	80	85
		2.3.3	Information	80	80	80	80
	Habitats	2.4.1	Outcome	80	80	80	80
		2.4.2	Management	70	80	80	80
		2.4.3	Information	75	80	80	80
	Ecosystem	2.5.1	Outcome	80	80	80	80
		2.5.2	Management	75	75	90	90
		2.5.3	Information	75	75	95	95
Translocation	2.6.1	Outcome	80	80	80	80	
	2.6.2	Management	85	85	85	85	
	2.6.3	Information	80	80	80	80	
P3	Governance and policy	3.1.1	Legal & customary framework	85	85	85	95
		3.1.2	Consultation, roles & responsibilities	95	95	95	100
		3.1.3	Long term objectives	100	100	100	100
		3.1.4	Incentives for sustainable fishing	90	90	90	100
	Fishery specific management system	3.2.1	Fishery specific objectives	80	80	80	80
		3.2.2	Decision making processes	75	75	80	80
		3.2.3	Compliance & enforcement	95	95	95	100
		3.2.4	Research plan	70	70	80	80
		3.2.5	Monitoring & management performance evaluation	80	80	80	80

4.3. Assessment Methodologies

The MSC Principle and Criteria for Sustainable Fishing Standard sets out the requirements for a certified fishery. The Certification Methodology adopted by the MSC involves the interpretation of these Principles and Criteria into specific Performance Indicators against which the performances of the fishery can be measured according to pre-specified guideposts. The version of the default assessment tree against which this fishery has been assessed includes 30 (or 31 if the rebuilding PI is scored) Performance Indicators. A fishery is assessed against three Principles. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock belongs to; and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations.

PRINCIPLE 1: Sustainable fish stock

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

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within the specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

PRINCIPLE 2: Minimizing environment impact

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

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

Criteria

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.
3. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within the specified time frame.

PRINCIPLE 3: Effective management

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

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

Criteria

1. The fishery shall not be conducted under controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishery-dependent communities shall be addressed as part of this process.
3. appropriate to cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedure for implementation and a process for monitoring and evaluating performance and acting on findings;
4. observe the legal and customary and long term interests of people dependent on fishing for food and livelihoods, in a manner consistent with ecological sustainability;
5. incorporate an appropriate mechanism for the resolution of disputes arising within the system;
6. provide economic and social incentives that contributes to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;
7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;
8. incorporate a research plan - appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interest parties in a timely fashion;
9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource;
11. contain appropriate procedures to ensure effective monitoring, control and enforcement to ensure established limits are not exceeded and specifies corrective actions to be taken in the event that they are.

Fishing operations shall:

12. make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
13. implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical and sensitive zones such as spawning and nursery areas;
14. not use destructive fishing practices such as fishing with poisons or explosives;
15. minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.;
16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and
17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

4.3.1. MSC Scheme Documents

This re-assessment followed the current version of MSC procedures implemented by SAI Global’s accredited MSC Procedures (QP) using the MSC scheme documents outlined in Table 12.

Table 12. MSC scheme documents used during re-assessment activities.

MSC Scheme Document	Version	Issue Date	Implementation
MSC Certification Requirements	1.3	January 14 th , 2013	Standard
MSC FCR and Guidance	2.0	October 1 st , 2014	Process
General Certification Requirements	2.1	February 20 th , 2015	Process
Full Assessment Reporting Template*	2.0	October 8 th , 2014	Process

* The Full Assessment Reporting Template was modified to reflect that the fishery was being assessed against the MSC CR v1.3 Default Assessment Tree for enhanced CAG bivalve fisheries.

4.3.2. Applicability of the Default Assessment Tree

The Northern Ireland Bottom Grown Mussel Fishery represents an enhanced Catch and Grow (CAG) bivalve fishery with seed collected by dredging/fishing and translocation. As a result the default assessment tree has been replaced with one specifically designed for the assessment of fisheries such as this. Modifications to the Default Tree for Enhanced Bivalve Fisheries applicable to this fishery are outlined in Annex CK of the MSC CR v1.3. The modifications result in four additional PIs relating to genetics (PI 1.1.4) and translocation (PI 2.6.1, PI 2.6.2 and PI 2.6.3).

There are no particular characteristics of the fishery that would necessitate any further revisions to the default assessment tree from those outlined in Annex CK. Therefore this assessment fishery uses the default assessment tree (MSC CR v1.3) with some additional adjustments for enhanced CAG bivalve fisheries.

4.4. Evaluation Processes and Techniques

4.4.1. Site Visits

Initial consultation meetings were held in late-November 2017. The objectives of the consultation meetings were to provide information and understanding of the activities of the CAB and to discuss the fishery management organizational roles in the management of the bottom grown mussel fisheries. These consultations were designed to strategically capture sufficient information to ensure understanding and confidence with respect to full re-assessment scoring. In addition all identified stakeholders were contacted directly and invited to participate in the Assessment process.

The on-site consultation also served other important functions. These included:

- Responding to questions and comments raised by participants in the fishery at this initial stage in the assessment.
- The client group provided information, documents, and a list of stakeholders as required by SAI Global. This served to allow the assessment team to collect general information on the fisheries, identify information gaps and identify key stakeholders for the information gathering exercise.
- Following the collation of general information on the fishery, a number of meetings with key stakeholders who expressed an interest to meet were scheduled by the team to fill in information gaps and to explore and discuss areas of concern.

Arising out of the stakeholder consultation plan preparation a considerable number of stakeholders were contacted directly by e-mail and a final direct consultation plan for the audit was prepared. Table 13 details the dates, meeting locations and organisations that were consulted through direct meetings during the on-site assessment.

The assessment team was made aware by BIM that a number of stakeholder organisations had met with representatives of BIM in late-2017 to express concerns about the bottom mussel industry. While a number of these stakeholders had previously been identified, and thus would have been contacted directly via email, none responded requesting to meet with the Assessment Team.

In addition, Friday 17th November 2017 was originally supposed to be the closing date for stakeholders to express their interest in meeting the team, due to a poor response rate, it was decided to extend this deadline until Wednesday 22nd November. An additional email was also sent to all previously identified stakeholders advising of the extension and requesting that they contact SAI Global if they wished to meet with the assessment team. Unfortunately the response rate was again low.

The meeting on 30th November 2017 was attended by the full assessment team. Due to unforeseen circumstances Fergal Guilfoyle was unable to attend the meeting on the 29th November 2017.

Table 13. Consultation Meetings during the On Site Assessment of the Northern Ireland Bottom Grown Mussel Fishery.

Organisation	Present at Meeting	Location	Venue	Date/Time	Purpose
Bord Iascaigh Mhara (BIM)	<p>BIM staff Joanne Gaffney Donal Maguire Nicolas Chopin</p> <p>Assessment team* Sam Dignan Deirdre Hoare Conor Donnelly</p>	Dun Laoghaire, Ireland	BIM Offices	29 th November 2017 09:30 AM	<ul style="list-style-type: none"> ▪ Discussion of the evidence pack ▪ Update on 2017 fishery ▪ Changes to fishery in 2016/2017
Members of: The Bottom Grown Mussel Consultative Forum, BIM, the Loughs Agency, DAERA, BIM, Marine Institute, Industry and SFPA	<p>BIM staff Joanne Gaffney Michael Murphy Vicky Lyons</p> <p>Francis O'Brien (Marine Institute) Barry Fox (Loughs Agency) John McGuigan (DAERA) Declan Quigley (SFPA)</p> <p>Industry/BGMCF members Michael Havelin Raymond Dougal William Dingemanse Bryan Hyland Authur McCarty Brian Cunningham</p> <p>Assessment team Sam Dignan Deirdre Hoare Conor Donnelly Fergal Guilfoyle</p>	Dun Laoghaire, Ireland	BIM Offices	30 th November 2017 10:30 AM	<ul style="list-style-type: none"> ▪ RBF for target species ▪ Changes to Management personnel, policies and regulations ▪ Science Update: Stock status, survey results, new initiatives ▪ Resource Management Update ▪ Highlights of 2017 seed mussel fishery ▪ Conservation and Protection Update ▪ Enforcement outcomes for 2017 fishery ▪ Bycatch species and bycatch program ▪ Habitats impacts ▪ Stocking density, Ecosystem impacts, strategy, Appropriate Assessments decision-making processes ▪ Research Plan ▪ Progress against milestones contained in the Action Plan approved for the currently open conditions attached to this fishery.

*Due to unforeseen circumstances Fergal Guilfoyle was unable to attend this particular meeting.

4.4.2. Consultations

Details of public announcements of the progression of the re-assessment were made as described in Table 14 below.

Table 14. Stakeholder consultation process

Date	Purpose	Media
14/09/2017	<ul style="list-style-type: none"> ▪ Fishery announcement including: <ul style="list-style-type: none"> • Confirmation of Assessment Team • Confirmation of Assessment Tree • Site Visit scheduled • Client sharing agreement ▪ Indicative timeline ▪ Proposal to use RBF ▪ Team members' CVs 	<ul style="list-style-type: none"> ▪ Notification on MSC website. ▪ Direct email.
19/10/2017	<ul style="list-style-type: none"> ▪ SH notification of additional team member ▪ CV for additional team member 	<ul style="list-style-type: none"> ▪ Notification on MSC website. ▪ Direct email.
24/01/2018	<ul style="list-style-type: none"> ▪ Proposed Peer Reviewers 	<ul style="list-style-type: none"> ▪ Notification on MSC website. ▪ Direct email.
21/05/2018	<ul style="list-style-type: none"> ▪ Public Comment Draft Report published 	<ul style="list-style-type: none"> ▪ Notification on MSC website. ▪ Direct email.
04/07/2018	<ul style="list-style-type: none"> ▪ Final Report published 	<ul style="list-style-type: none"> ▪ Notification on MSC website. ▪ Direct email.

4.4.2.1. Rationale for choosing the media for public announcements

Public announcements relating to the fishery were posted on the MSC website as this was felt to be the most appropriate media for such announcements. In addition all identified stakeholders were contacted directly via email informing them of the substance of any announcements and advising where the announcements themselves could be accessed. All identified stakeholders were also furnished with copies of consultation announcements including the “MSC Template for Stakeholder Input into Fishery Assessments” no longer than 4 days after the start of each consultation period.

4.4.3. Evaluation Techniques

After the site visit the Assessment Team compiled and analysed all relevant information before proceeding to score the UoA against the Performance Indicator Scoring Guideposts (PISGs) in Default Assessment Tree. In scoring the UoA the Assessment Team, using the methodology set out in requirements 7.10 FCR (v2.0), discussed the evidence together, weighed up the balance of evidence and used their expert judgement to agree a final score. While individual team members led on the scoring of a principle (P1, P2 or P3 Assessor), their conclusions were discussed in detail and agreed upon by the Assessment Team as a whole; therefore the score for each PISG reflects the group consensus for that PI.

Note: the outcomes of stakeholder engagement and their supporting rationale are documented in the Evaluation Results section, while the specific content of stakeholder written or verbal submissions or information generated in meetings or workshops are provided in [Appendix 3](#) of this report.

4.4.3.1. The scoring process

In the MSC Assessment Process there are 4 distinct elements that contribute to a fishery’s score and ultimately determine whether or not a fishery is eligible for Certification, in descending order these are:

- Principles
 - Performance Indicators (PIs)
 - Performance Indicator Scoring Guideposts (PISGs)/Scoring Guideposts (PISGs)
 - Scoring Issues (SIs)

In order to be eligible for certification a fishery must achieve an overall weighted average score of 80 for each of the three Principles and scores of at least 60 for each and every PI.

Scoring Performance Indicators (PIs)

At the PI level, the performance of the fishery is assessed as a 'score' taking into account whether or not each Scoring Guidepost (SG60, SG80, SG100) was met for each Scoring Issue.

In order for the fishery to be eligible for certification, each PI must score 60 or more. If any PI scores 60 or more but less than 80 a Condition is raised for that PI. Any Conditions must be addressed by an agreed upon Client Action Plan (CAP). Any PI that scores 80 or more is awarded an unconditional pass.

PIs are normally scored to the nearest five units (60, 65, 70, etc.).

Performance Indicator Scoring Guideposts (PISGs)/Scoring Guideposts (PISGs)

Scoring Guideposts identify the level of performance necessary to achieve 60, 80 (a pass score), and 100 scores for each Scoring Issue under each Performance Indicator; note some PIs only have a single Scoring Issue.

PISGs are the benchmark level for a fisheries performance.

Scoring Issues

Scoring Issues are different parts of a PI covering related but different topics. Each PI has one or more SIs against which the fishery is assessed at the SG60, 80 and 100 levels; note there may not be a SI at every SG level.

If a Performance Indicator has multiple SIs some of which a particular Scoring Guidepost and some of which do not then an intermediate score may be awarded (e.g. 75, 85, 90).

Scoring Principles

Once each individual PI has been scored, the weighted score for each PI under each Principle is summed together in order to calculate the Principle level score for that Principle. Scoring at the Principle level is pass/fail and in order for the fishery to be eligible for certification, a fishery is required to achieve a score of 80 or more as the weighted average score of all PIs within that Principle. If any Principle scores less than 80 the fishery fails.

Principle level scores are reported to the nearest 0.1 units.

Scoring methodology

The scoring methodology is fully explained in the MSC Fisheries Assessment Methodology. It can be summarized as follows:

- Scoring is a qualitative process, involving discussion between team members and arrival at a joint agreed score. Scores should be normally assigned in divisions of 5 points
- The only narrative guidance that is available is at 60, 80 and 100 SGs. Intermediate scores must therefore reflect;
 - A failure to meet all the scoring issues specified in a SG.
- The following system should then be used to determine the overall score for the PI from the scores of the different scoring issues. This system combines a primary approach based on the combination of scores achieved by the individual scoring issues (the a) to i) list below):
 - a) Score = 60: all issues meet SG60, and only SG60. Any scoring issues within a PI which fails to reach SG60, represents a failure against the MSC standard and no score shall be assigned.

- b) 65: all issues meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
- c) 70: all issues meet SG60; some achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to ensure they get there.
- d) 75: all issues meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
- e) 80: all issues meet SG80.
- f) 85: all issues meet SG80; a few achieve higher performance, but most do not meet SG100.
- g) 90: all issues meet SG80; some achieve higher performance at SG100 but some do not.
- h) 95: all issues meet SG80; most achieve higher performance, at SG100; only a few fail to achieve SG100.
- i) 100: all issues meet SG100

4.4.3.2. Scoring elements considered in each outcome PI in Principles 1 and 2

Table 15 below describes the set of scoring elements (e.g. species or habitats) that have been considered in each outcome PI in Principles 1 and 2. The Table also describes under which component each scoring element was assessed and whether any scoring elements were data-deficient.

Table 15. Scoring elements considered in each outcome PI in Principles 1 and 2.

PI	Component	Scoring element	Data-deficient?
PI 1.1.1	Target species	Blue mussel (<i>Mytilus edulis</i>)	Yes
PI 2.1.1	Retained species	none	–
PI 2.2.1	Bycatch species	See Table 6	Yes
PI 2.3.1	ETP species	See Table 7	No
PI 2.4.1	Habitats	Benthic habitats in area of operation of fisheries	No
PI 2.5.1	Ecosystem	Marine ecosystems in area of operation of fisheries	No

The impacts of the fishery on the target stock cannot be analytically determined, therefore, the RBF was used to assess the fisheries impacts on this component. For more details see in Appendix 1.2.1.

In addition there are numerous Minor Bycatch species for which there is currently no formal stock assessment and no management reference points. Therefore the impacts of the fishery on this component cannot be quantitatively determined. As a result the Risk Based Framework (RBF) was used to assess the impact of the bottom grown mussel fisheries on bycatch species in the study area the details of which can be found in Appendix 1.2.2.

5. Traceability

5.1. Eligibility Date

In accordance with FCR 7.6.1 the CAB shall nominate a date from which product from a certified fishery is eligible to be sold as MSC certified or bear the MSC ecolabel (the eligibility date) which may be either the date of the certification of the fishery; or the publication date of the first Public Comment Draft Report. The client has indicated their desire to have product become eligible on the date of publication of the first PCDR; this product may become eligible for identification with an MSC claim on eventual certification of the fishery.

The PCDR was published on 21st May 2018. The expected date of publication of the Public Certification Report is July 2018. The eligibility date will be the date of the publication of the first PCDR. Following FCR 7.8.3.2 an indicative assessment timeline has been uploaded to the MSC website.

This Assessment represents a re-assessment of the Applicant fishery and there is not expected to be any gap in certification between the old certificate and the new one resulting from this current assessment. However, should such a situation arise, as the eligibility date has been set before the certification date, the Client has been informed that any fish harvested after the eligibility date and sold or stored as under-assessment fish shall be handled in conformity with relevant under-assessment product requirements in the MSC Chain of Custody standard.

Traceability and segregation systems in the fishery will be implemented by this date as they are already in place for other Certification Schemes. There is no risk of loss in the traceability, segregation and identification systems and these systems can differentiate product from before or after the eligibility date.

5.2. Traceability within the Fishery

Traceability of product from the sea to the consumer is important so as to ensure that the MSC standard is maintained. There are several aspects to traceability that the MSC require to be evaluated including traceability within the fishery; at-sea processing; at the point of landing; and subsequently the eligibility of product to enter the chain of custody. These requirements are assessed here.

Traceability up to the point of first landing has been scrutinized as part of this assessment and the results reflect the fact that there are systems in place that are adequate to ensure fish is caught in a legal manner and is accurately recorded.

The monitoring control and surveillance system is considered to be comprehensive. As well as traditional methods such as vessel patrols, VMS is used to track fleet movement and reporting via SMS used to monitor seed mussel catches in near real time. Risk factors for traceability within the fishery are identified in Table 16.

Table 16. Traceability Factors within the Fishery.

Risk Factor	Description of risk if applicable
The possibility of non-certified gear being used within the fishery	No risk. Dredge is the only gear used to target mussels. In the past there has been limited hand raking but this has not taken place on a commercial scale in recent years.
The possibility of vessels from the UoC fishing outside the UoC or in different geographical areas (on the same trip or on different trips)	No risk. Dredge vessels from the UoC do not fish outside the geographical area covered by the UoC.
The possibility of vessels from outside the UoC or client group fishing the same stock	The target stock is blue mussels around the island of Ireland. All members of the Bottom Grown Mussel Industry, eligible to fish in the relevant jurisdiction, will be eligible to access the certificates. There are currently no other eligible fishers. Potential other eligible fishers are those entities that have not contributed financially to the MSC process.

Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction).	Vessels included in the UoC can realize their activities within coastal waters around the island of Ireland. All mussels within the UoA fished by certified gears are potentially eligible for certification upon sale to a member of the client group. Therefore there is no risk of mixing certified with non-certified catch during storage, transport, or handling activities.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody).	There is no at sea processing.
Risks of mixing between certified and non-certified catch during transshipment.	There is no transshipment.
Any other risks of substitution between fish from the UoC and fish from outside this unit	No risk. All mussels fished within the UoA by licensed vessels using certified gears are potentially eligible for certification upon sale to a member of the client group.

5.3. Eligibility to Enter Further Chains of Custody

Chain of Custody commences at the point of first sale for any party not included in the fishery certificate and for parties within the fishery certificate.

The scope of the fishery certificate includes all eligible vessels. The certificate is owned by the client who represent all eligible vessels. Vessels that are part of the client group and who land mussels from the certified fishery do not require chain of custody. An active list of eligible vessels as well as processors who are part of the client group has been provided (Table 17). Going forward this will be updated as appropriate and maintained on the fishery's page on the MSC website where it will be available to buyers.

Table 17. Client group list (as of September 2017).

CG entity #	Client group entity	Activity
1	Cloughmore Shellfish Ltd	Harvester Only
2	Lough Garman Harbour Mussels Ltd	Harvester Only
3	Down Mussels Ltd	Harvester Only
4	Emerald Mussels Ltd	Harvester Only
5	Dougold Mussels Ltd	Harvester Only
6	Crescent Seafoods	Harvester Only
7	Carlingford Lough Mussels Ltd	Harvester Only
8	O'Sullivan McCarthy Mussel Development Ltd	Harvester Only
9	Cromane Seafoods Ltd	Harvester Only
10	Lenger Seafoods Ltd	Harvester Only
11	Wexford Mussels Ltd	Harvester Only
12	Tully Shellfish	Harvester Only

The system for recording the transfer of product to buyers is sufficient to identify that all product is eligible for MSC CoC.

5.4. Eligibility of IPI stock(s) to Enter Further Chains of Custody

There are no Inseparable or Practicably Inseparable (IPI) stock(s) involved in the certification.

6. Evaluation Results

6.1. Principle Level Scores

The Northern Ireland Bottom Grown Mussel Fishery achieved a score of 80 or higher on each of the three MSC Principles independently and did not score less than 80 against any Performance Indicator. Score achieved in each Principle and for each Performance Indicator are shown in Table 18 and Table 19, respectively.

Table 18. Final Principle Scores.

Principle	Score
Principle 1 – Target Species	82.7
Principle 2 – Ecosystem	87.2
Principle 3 – Management System	91.4

6.2. Summary of PI Level Scores

Final scores for each Performance Indicator are shown in Table 19 below.

Table 19. Summary of Performance Indicator scores.

Principle	Component	Performance Indicator (PI)	Score
One	Outcome	1.1.1 Stock status	96.0
		1.1.2 Reference Points	80
		1.1.4 Genetic outcome	80
	Management	1.2.1 Harvest strategy	80
		1.2.2 Harvest control rules & tools	80
		1.2.3 Information & monitoring	80
		1.2.4 Assessment of stock status	80
Two	Retained species	2.1.1 Outcome	100
		2.1.2 Management	100
		2.1.3 Information	95
	Bycatch species	2.2.1 Outcome	100
		2.2.2 Management	80
		2.2.3 Information	80
	ETP species	2.3.1 Outcome	100
		2.3.2 Management	85
		2.3.3 Information	80
	Habitats	2.4.1 Outcome	80
		2.4.2 Management	80
		2.4.3 Information	80
	Ecosystem	2.5.1 Outcome	80
		2.5.2 Management	90
		2.5.3 Information	95
Translocation	2.6.1 Outcome	80	
	2.6.2 Management	85	
	2.6.3 Information	80	
Three	Governance and policy	3.1.1 Legal & customary framework	95
		3.1.2 Consultation, roles & responsibilities	100
		3.1.3 Long term objectives	100
		3.1.4 Incentives for sustainable fishing	100
	Fishery specific management system	3.2.1 Fishery specific objectives	80
		3.2.2 Decision making processes	80
		3.2.3 Compliance & enforcement	100
		3.2.4 Research plan	80
		3.2.5 Monitoring & management performance evaluation	80

6.3. Summary of Conditions

During this re-assessment of the Northern Ireland Bottom Grown Mussel Fishery, a conditional score has not been allocated for any PI with all PIs meeting at least the SG80 level.

6.4. Summary of Recommendations

While no Conditions were assigned the Assessment Team was of the opinion that a number of Recommendations are warranted. Recommendations are not obligatory and while they do not require actions on the part of the fishery the client is encourage to act upon them within the spirit of the MSC certification. The two recommendations are presented in Table 20 and Table 21 below.

6.4.1. Recommendation 1

Table 20. Recommendation 1

<i>Recommendation 1 (of 2)</i>	
Relevant PI(s)	All Principle 1 PIs.
Recommendation	<p>With regard to the ephemeral nature of the seed mussel beds, a synthesis of the currently available evidence (including both spatial and temporal data) in this regard would be extremely useful.</p> <p>Given the fact that the sustainability argument for this fishery hinges on the seed mussel beds being ephemeral, and given the level of stakeholder disquiet with the premise, the client should undertake a synthesis of all currently available evidence to support the assertion that the seed mussel beds exploited by the fishery are in fact ephemeral.</p>

6.4.2. Recommendation 2

Table 21. Recommendation 2

<i>Recommendation 2 (of 2)</i>	
Relevant PI(s)	Principle 2 Ecosystem PIs.
Recommendation	<p>For all on-growing not already covered by one, management should continue to conduct Appropriate Assessments. For a number of surveillance audits now the Assessment Team has been advised that an Appropriate Assessment of Wexford Harbour is in development but to date the process has not been finalized and a report has not been produced. The client should endeavour to liaise with management to ensure the process is completed and a report available as soon as possible.</p>

6.5. Determination, Formal Conclusion and Agreement

Following a meeting on 4th July 2018, SAI Global's internal Certification Committee, having considered this report and the Assessment Team's recommendation, determined that:

- Northern Ireland Bottom Grown mussel is to be awarded continued MSC certification.

SAI Global hereby publicly announces its intention to re-certify the Fishery for a further 5-year period.

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Useful Websites

Republic of Ireland

- BIM: www.bim.ie
- Cromane Community Council: www.cromane.net/fishing.htm
- National Parks and Wildlife Service (NPWS): www.npws.ie
- Sea Fisheries Protection Authority (SFPA): www.sfpa.ie
- Marine Institute: www.marine.ie
- Department of Agriculture, Food and the Marine (DAFM): www.agriculture.gov.ie
- Irish Farmers Association (IFA): <http://www.ifa.ie/Sectors/Aquaculture.aspx>
- Aquaculture License Appeals Board: www.alab.ie

Northern Ireland

- AFBI Website: www.afbini.gov.uk
- Department of Agriculture, Environment and Rural Affairs (DAERA): <https://www.daera-ni.gov.uk/>
- Department of the Environment: <http://www.doeni.gov.uk/>
- Department of Transport: <http://www.dft.gov.uk/mca/>

Cross-border

- The Loughs Agency website: www.loughs-agency.org.uk/
- Cross Border Aquaculture Initiative: www.aquacultureinitiative.eu/
- Foyle, Carlingford and Irish Lights Commission: www.northsouthministerialcouncil.org/index/north-south-implementation-bodies/foyle_carlingford-and-irish-lights.htm

European/International

- FAO: <http://www.fao.org/>
- European Commission Fisheries: http://ec.europa.eu/fisheries/index_en.htm
- European Fishing Control Agency: <http://cfca.europa.eu/pages/home/home.htm>
- MarLIN Website: <http://www.marlin.ac.uk/biotic>
- CITES website: www.cites.org
- The Bird Directive http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

7.1. Relevant MSC Interpretations
MSC Interpretation Log ID 1535

Use of 'if necessary' in P2 management PIs (2.1.2, 2.2.2, 2.4.2, 2.5.2)

Does the 'if necessary' clause in scoring issue (a) of PIs 2.1.2, 2.2.2, 2.4.2 and 2.5.2 mean that it applies to scoring issues (b) and (c), which refer back to the measures or partial strategy? i.e. If measures or partial strategy are not needed because there is no or negligible impact on the specific component, do you still need to score the SG60 and SG80 for 'management strategy evaluation' and 'management strategy implementation'?

1 Answer

Although it is not specified in the requirements, the MSC's intent is that the 'if necessary' in scoring issue (a) also pertains to scoring issues (b) and (c). If the fishery does not need to have measures or partial strategy because there is no or negligible impact on Primary, Secondary, Habitats or Ecosystem components, it would meet at least the SG80 level in scoring issues a-c. However, additional scoring issues like shark finning, unwanted catch or compliance with management requirements for VMEs would still need to be scored at all levels if they apply (the shark finning scoring issue is only scored if there is a secondary species that is a shark, as indicated by the curly brackets and confirmed in the guidance).

8. Appendices

8.1. Appendix 1. Scoring and Rationales

8.1.1. Appendix 1.1 Performance Indicator Scores and Rationale – Evaluation Tables

8.1.1.1. Principle 1 – Sustainable Target Fish Stocks – Evaluation Tables

PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Not applicable	Not applicable	Not applicable
	Justification	Due to their being no formal stock assessment and no management reference points, biologically-based limits for sustainability (e.g. reference points) cannot be estimated such that serious or irreversible harm can be identified. As this is the case the assessment team instead elected to use Annex CC (the Risk Based Framework (RBF)) to score this PI. The default Scoring Guidepost presented here are not applicable the outputs of the RBF assessment are presented in Appendix 1.2 .		
b	Guidepost		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Not applicable	Not applicable
	Justification	Not Applicable. See supporting rationale in justification for Sla above.		
References		Not Applicable. See supporting rationale in justification for Sla above.		
Stock Status relative to Reference Points				
	Type of reference point	Value of reference point	Current stock status relative to reference point	
Target reference point	Not Applicable – RBF used instead.	Not Applicable – RBF used instead.	Not Applicable – RBF used instead.	
Limit reference point	Not Applicable – RBF used instead.	Not Applicable – RBF used instead.	Not Applicable – RBF used instead.	
OVERALL PERFORMANCE INDICATOR SCORE:				96.0
CONDITION NUMBER (if relevant):				

PI 1.1.2 – Reference points

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Not scored	Not scored	
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
b	Guidepost		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Not scored	Not scored
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
c	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Not scored	Not scored
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not relevant	
	Justification	SId is not relevant as blue mussels do not represent a key lower trophic level species.		
References		MSC CR v1.3.		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

PI 1.1.3 – Stock rebuilding

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	Not applicable		Not applicable
	Justification	There is no evidence that mussel stocks around the island of Ireland are currently overfished. Therefore, PI 1.1.3 is not applicable.		
b	Guidepost	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	Not applicable	Not applicable	Not applicable
	Justification	There is no evidence that mussel stocks around the island of Ireland are currently overfished. Therefore, PI 1.1.3 is not applicable.		
c	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	Not applicable	Not applicable	
	Justification	There is no evidence that mussel stocks around the island of Ireland are currently overfished. Therefore, PI 1.1.3 is not applicable.		
References		MSC CR v1.3.		
OVERALL PERFORMANCE INDICATOR SCORE:				n/a
CONDITION NUMBER (if relevant):				

PI 1.1.4 – Genetic Outcome

PI 1.1.4		Genetic Outcome – The fishery has negligible discernible impact on the genetic structure of the population.		
Scoring Issue		SG 60	SG 80	SG 100
a	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?		Y	Y	N
Justification		<p>The fishery is highly unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.</p> <p>There are two issues to consider in relation to the potential impact of the fishery on the genetic structure of wild populations. Firstly, does the harvesting of seed mussel and the subsequent relaying of that mussel have any impact on the genetic structure of mussels around the island of Ireland, and secondly does harvesting and relaying activity have the potential to increase the mixing and possible hybridisation of <i>M. edulis</i> with <i>M. galloprovincialis</i>?</p> <p>Geographical distance of movement of seed mussels within the fishery is minor in relation to the geographical extent of the stock. There is very likely to be a single well-mixed population of <i>M. edulis</i> in the Irish Sea and it is highly unlikely that there is any spatial genetic structure in the main fishery within the Irish Sea (MEP, 2010). In conjunction with a larval duration of up to 4 weeks, and strong tides and currents in the Irish Sea, it is a reasonable assumption that the population of mussels in the Irish Sea is panmictic, and indeed there is no evidence of any genetic structure around the coast of the UK and Ireland (Koehn et al., 1976). Movement of seed mussel between NI and IE is permitted, but both areas are considered to be the same genetic stock, so there is no likelihood of any impact on the genetic structure. In the case of Cromane, the only on-growing site on the west coast of Ireland, only seed harvested locally is permitted to be re-laid within the bay. On that basis the fishery is highly unlikely to impact the genetic structure of the wild populations.</p> <p>Identification of the presence of <i>M. galloprovincialis</i> is difficult because it is impossible to distinguish between <i>M. edulis</i> and <i>M. galloprovincialis</i> except by genetic marker.</p> <p>A genetic analysis commissioned by BIM of mussel samples from various sites around Ireland which showed significant presence of <i>M. galloprovincialis</i> and <i>M. edulis/M. galloprovincialis</i> hybrids. For west coast sites, overall 58% of samples were <i>M. edulis</i>, 14% were <i>M. galloprovincialis</i> and 29% were hybrids. However, no presence of <i>M. galloprovincialis</i> was found off Cromane and Wicklow or in Lough Foyle. Gosling et al. (2008) did find high proportions of <i>M. galloprovincialis</i> in the south eastern Irish Sea, while a sample from Wexford Harbour was found to be comprised of 30% <i>M. edulis</i>, 53% <i>M. galloprovincialis</i>, and 17% hybrids (Gosling et al., unpublished). The presence of <i>M. galloprovincialis</i> and <i>M. edulis/M. galloprovincialis</i> hybrids in Wexford suggests that either through natural settlement or through translocation of rope-grown mussel, <i>M. galloprovincialis</i> is already present in the Irish Sea.</p> <p>Given the fact that <i>M. galloprovincialis</i> and <i>M. edulis/M. galloprovincialis</i> are already present in many of the areas associated with this fishery, the impacts of the fishery in comparison to background levels is highly unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm; SG60 and SG80 are met.</p>		

PI 1.1.4	Genetic Outcome – The fishery has negligible discernible impact on the genetic structure of the population.	
		There has been no independent peer-reviewed assessment which specifically reviews the genetic structure of mussel stocks around the island of Ireland which 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; SG100 is not met.
References	<p>Gosling, E., Doherty, S. and Howley, N. 2008. Genetic characterisation of hybrid mussel (<i>Mytilus</i>) population on Irish coast. <i>J. Mar. Biol. Ass. UK.</i> 88:341-346.</p> <p>Hilbish, T.J., Carson, E.W., Plante, J.R., Weaver, L.A. and Gilg, M.R. 2002. Distribution of <i>Mytilus edulis</i>, <i>M. galloprovincialis</i> and their hybrids in open-coast populations of mussels in southwestern England. <i>Marine Biology</i> 140: 137-142.</p> <p>Inoue, K., Waite, J.H., Matsuoka, M., Odo, S. and Harayama, S. 1995. Interspecific variations in adhesive protein sequences of <i>Mytilus edulis</i>, <i>M. galloprovincialis</i>, and <i>M. trossulus</i>. <i>Biol. Bull.</i> 189: 370-375.</p> <p>Koehn, R.K., Milkman, R. and Mitton, J.B. 1976. Population genetics of marine Pelecypods. IV. Selection, migration and genetic differentiation in the blue mussel, <i>Mytilus edulis</i>. <i>Evolution</i> 30: 2-32</p> <p>MEP. 2010. Final Report North Menai Strait mussel fishery (<i>Mytilus edulis</i>).</p> <p>Wood, A.R., Beaumont, A.R., Skibinski, D.F.O. and Turner, G. 2003. Analysis of a nuclear DNA marker for species identification of adults and larvae in the <i>Mytilus edulis</i> complex. <i>Journal of Molluscan Studies</i> 69: 61-66.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		

PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	N
	Justification	<p>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives.</p> <p>The key stock management objective is to provide sufficient seed mussel for re-laying on licensed cultivation sites within Northern Ireland and Ireland on a continuous basis. Implicit within the management objectives for the seed mussel fishery is that the seed mussel beds are ephemeral and so harvesting of seed mussel is considered highly unlikely to have any consequence for mussel population size, and this is reflected in the harvest strategy. The strategy is therefore to manage the seed mussel fishery, and not to manage the mussel stock(s) around the island of Ireland, and so conventional stock assessments with target and limit reference points are not appropriate in this fishery.</p> <p>In the absence of stock specific reference points as management objectives, MSC guidance requires the assessment to consider that the harvest strategy ensures that susceptibility is maintained at or below acceptable levels given the productivity of the species. The limited spatial scale of the seed mussel harvesting activity in relation to the distribution of the mussel stock, in conjunction with the harvesting of seed from seed beds that are essentially ephemeral in nature, and the practice of re-laying of seed mussel for cultivation and on-growing to reproductively-active adults, with the potential for actually enhancing rather than impacting negatively on recruitment, ensures that susceptibility of the mussel stock to the fishing activity is minimal.</p> <p>The harvest strategy is based on a limited entry fishery, and only those individuals who hold a licence for a cultivation site may fish for seed mussels. The key elements of the harvest strategy are set out in the Policy Document (2004) developed through consultation between the bottom grown mussel industry and the relevant departments of the Irish and Northern Irish Governments.</p> <p>In IE seed mussels may only be harvested by a fishing vessel licensed for sea fishing by the DAFM. Dredging of mussel seed by Irish registered vessels and reseedling of the seed for the purposes of on-growing within the exclusive fishery limits of IE may take place only on issue of a licence under the Mussel Seed (Conservation of Stocks) Order 1987, (S.I. No. 118 of 1987) as amended by the Mussel Seed (Conservation and Rational Exploitation) Order 2003 (S.I. No. 241 of 2003). Prior to the 2015 Supreme Court case in which the Voisinage Agreement was found to have no basis in law, Northern Irish vessels were required to have a proven economic link to Northern Ireland in order to fish in Irish waters. Despite the fact that Northern Irish vessels cannot currently fish in Republic of Ireland waters, there remains a reciprocal arrangement for Irish vessels fishing in Northern Irish waters.</p> <p>Northern Irish vessels are included in the UK register of fishing vessels, and cultivation sites are licensed under the Fisheries Act (Northern Ireland) 1966 through issue of a Fish Culture Licence. Normally the Molluscan Shellfish (Control of Deposit) Order Northern Ireland 1972 prohibits movement of molluscan shellfish to Northern Irish waters from outside waters, but mussel seed harvested in Ireland can be re-laid under a section 13 permit of the Fisheries Act (Northern Ireland) 1966, on the condition that samples must be made available to DARD officers and relayed only on licensed sites.</p>		

PI 1.2.1	There is a robust and precautionary harvest strategy in place
	<p>BIM, AFBI and the Loughs Agency carry out annual surveys of the main seed beds around the Island of Ireland to provide information to managers and licence holders on the biomass and size range of seed mussels on the seed beds. The surveys use acoustic survey methods, with only occasional samples of seed mussels taken to verify the acoustic survey results. Any seed mussels sampled are returned to the seabed. Licence holders may also carry out surveys for seed mussels prior to the main seed mussel harvesting season. These stakeholder surveys must be notified in advance to the SFPA in IE waters and require approval from DAERA in NI waters</p> <p>Decisions on when to open and close seed mussel beds are driven by a number of factors (e.g. time of year, condition of seed, presence of predators). However in or adjacent to Natura sites decisions are taken in accordance to the requirement of Article 6(3) of the Birds and Habitats Directives which apply in the two countries. All NATURA 2000 sites are closed for fishing seed unless a test of significance/screening and an appropriate assessment if required has been completed. In IE all skippers must have a NATURA permit to fish for seed within or adjacent to a NATURA 2000 site and the skipper must not breach the condition of this NATURA Permit. SAC and SPA designated and proposed areas in the IE are fully protected by law from when the Minister gives notice of his intention to designate the sites. Since nearly the entire NI coastline is designated, all mussel seed beds in this jurisdiction are closed until a test of significance/screening and an appropriate assessment if required has taken place.</p> <p>Similarly, in designated locations in Ireland such as Cromane and areas of the Irish Sea, a screening and a full assessment if required must be completed before the seed mussel fishery can be opened. However, once assessments have been completed and no significant risks are identified seed mussel beds are considered to be open during the defined season unless they are closed by DAFM. Such closures take place temporarily following discussions with licence holders if the size range of mussels is dominated by small mussels, which are considered not yet ready for relaying on to the cultivation sites.</p> <p>The harvest strategy is designed to provide sufficient seed mussel for re-laying on licensed cultivation sites within IE and NI on a continuous basis. The harvest strategy is therefore to manage the seed mussel fishery in terms of the historical performance, ecosystem indicators and success of the harvest or relay sites, and not to manage the mussel stock (Joanne Gaffney, pers. comm.). The two key elements of the fishery which underlie the strategy are firstly that seed mussels are removed from ephemeral seed beds where, if left on the beds, the seed would not survive over winter, and secondly that such harvesting is not conventional fishing mortality or exploitation, but a re-laying of these vulnerable seed mussels on more sheltered areas for on-growing until the mussels have an opportunity to contribute to the reproductive output of the stock. On that basis the harvest strategy is responsive to the state of the stock as it is designed to increase recruitment to the stock.</p> <p>Whilst some seed mussel beds have been observed to overwinter, the time series of data from BIM mussel seed surveys for Wicklow and Wexford, which date back to the 1960s and 1970s, confirm that the distribution of seed beds varies from year to year, and indicate that while seed beds do sometimes overwinter, no currently identified beds consistently overwinter in all years. Therefore, no currently identified beds have been described as “stable” (Joanne Gaffney, BIM, pers. comm.).</p> <p>The mussel seed allocations were implemented to ensure that cultivation sites were not overloaded with inappropriate volumes of mussel seed and to promote acceptable growth or mussel yield and productivity on the relaying sites. The seed allocations are therefore designed to be precautionary and the harvest strategy is designed implicitly to ensure that that optimum use is made of the translocated seed.</p> <p>For seed beds in Natura 2000 sites, where a test of significance/screening and an appropriate assessment if required has been carried out, the harvest strategy is responsive to the state of the</p>

PI	1.2.1	There is a robust and precautionary harvest strategy in place		
		<p>stock for the objective within SPA's of provisioning for sufficient seed mussel resource remaining as a prey item for designated bird species within the area. In SPA's , annual surveys of seed mussel resource are undertaken by BIM, ABFI or the Loughs Agency and biomass estimates from these surveys are then used annually to "ring-fence" a specific percentage of the biomass as a food source for protected birds which are capable of accessing the resource within the area. In consequence, the biomass of seed mussels that can be harvested from a bed within an SPA and relayed for on-growing will be limited, and this limit will vary annually in response to variation in seed mussel biomass estimated from the survey. (1/3rd of identified volume in the case of Cromane). When the seed mussel beds in Natura 2000 sites are opened, harvesting is carefully controlled to ensure that all licence holders are able to catch their fair share of the overall resource allocation.</p> <p>The harvest strategy is responsive to the state of the stock in that it is likely to maintain the susceptibility of the mussel stock below acceptable levels considering the productivity of the species; SG80 is met. However, it is not explicitly designed to achieve stock management objectives reflected in target and limit reference points; SG100 is not met.</p>		
b	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	<p>The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.</p> <p>The harvest strategy is likely to work because only licensed vessels can harvest seed mussels, vessels target seed beds which surveys have shown to have good numbers of large seed mussels, and all activity is strictly monitored. Experience from all seed mussel fisheries shows that harvesting occurs in areas where the seed beds are ephemeral, and if the mussels are not harvested prior to winter storms then they will not survive over winter. On the basis therefore that the harvesting of the seed mussels is highly unlikely to have any impact on population size, it seems reasonable to conclude that the harvest strategy will work; SG60 is met.</p> <p>The harvest strategy has not been fully tested, but annual monitoring of seed mussel beds has shown that, despite fluctuations in abundance and changes in the precise locations of beds, a significant biomass of seed mussels continues to be available to the fishery, providing some evidence that the harvest strategy is achieving its objectives. Monitoring of fishing activity shows good compliance with all elements of the harvest strategy; SG80 is met.</p> <p>The performance of the harvest strategy has not been fully evaluated so far. However, given the evidence that supports the premise that all current harvested seed beds are ephemeral with no potential for overwintering, and that all seed mussels are relayed on cultivation sites within IE or NI, then the harvest strategy should achieve its objective; SG100 is not met.</p>		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Monitoring is in place that is expected to determine whether the harvest strategy is working.		

PI	1.2.1	There is a robust and precautionary harvest strategy in place		
		<p>Seed mussel beds are surveyed annually allowing the identification of high densities of seed mussels for harvesting and evaluation of whether seed production by the mussel population has potentially been impacted by fishing. Full monitoring of fishing activity provides knowledge of levels of compliance with regulations, a key part of the harvest strategy.</p> <p>Once the season starts, all vessels must inform the relevant Department or agency at least 24 hours before departure on a fishing trip, and again on when and where they are going to land. They must also carry details of the cultivation site licence holders on whose behalf they are fishing. Harvesting of seed mussel is managed through a resource allocation, allocated to the cultivation site licence holder, although these resource allocations are not intended to reflect temporal changes in availability of seed mussel.</p> <p>Fishing activity is monitored very closely through VMS and a 'black box' on board all vessels, and through the completion of EU log books and a national spat mussel log book and for the IE waters submission of fishing data via the SMS system. Vessels are also subject to inspections by the relevant enforcement authorities in both IE and NI. These monitoring regulations ensure that a full record is gained of how much seed mussel was caught and where it was caught.</p> <p>A key component of the harvest strategy is that all harvested seed mussels must be re-laid within IE or NI licensed cultivation sites. Monitoring is in place that is expected to determine whether the harvest strategy is working; SG60 is met.</p>		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	<p>The harvest strategy has not been fully reviewed since 2005 when resource allocations for each licensed cultivation site were originally designated, although occasionally individual licence holders have been facilitated in a review of their original resource allocation. A number of strategy documents have been produced which recommend improvements to the harvest strategy (e.g. The Rising Tide, 2007; Maguire et al., 2007; McQuaid et al., 2007). In particular The Rising Tide Review was carried out by a review group from BIM, DARD, DAFM and the Loughs Agency with Terms of Reference set by ministers in both IE and NI supported by the Aquaculture Initiative (http://www.aquacultureinitiative.eu). The review included an industry consultation process.</p> <p>There has been no formal implementation of all of the recommendations emanating from the Rising Tide Review, although the Bottom Grown Mussel Consultative Forum (BGMCF) was formed as a result of the review, and has been instrumental in carrying forward many of the recommendations of The Rising Tide Review, on which annual progress reports are published (e.g. The Rising Tide Progress Report, 2011). The BGMCF has become a discussion group for policy, it provides a mechanism for industry dissemination, and a body to organise industry collective actions. It is also a central point of contact between the industry and the regulators and publishes its minutes on the Aquaculture Initiative website.</p> <p>In addition the BGMCF advises regulators on policy and coordinates fishery actions such as organising seed mussel surveys, identifying and prioritising research areas, and makes recommendations on operational issues such as opening dates for fisheries, seed beds that may be fished and vessels to be licensed to operate in any particular zone at any one time. While elements of the harvest strategy are being continually reviewed through the BGMCF, it cannot be said that the harvest strategy is periodically reviewed and improved as necessary; SG100 is not met.</p>		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant

PI 1.2.1	There is a robust and precautionary harvest strategy in place	
	Justification	The target species is not a species of shark. Therefore Sle is not relevant.
References	<p>Chopin (2011). Seed mussel survey report for Wexford and Rosslare areas, BIM survey report, 3 pp.</p> <p>Cross Border Aquaculture Initiative website: http://www.aquacultureinitiative.eu</p> <p>Maguire, JA, T Knights, G Burnell, T Crowe, F O’Beirn, D McGrath, M Ferns, N McDonough, N McQuaid, B O’Connor, R Doyle, C Newell, R Seed, A Small, T O’Carroll, L Watson, J Dennis, and M O’Cinneide, 2007. ‘Management Recommendations for the sustainable exploitation of mussel seed in the Irish Sea’. Marine Environment and Health Series. 3.1.</p> <p>McQuaid, N, D Roberts, C McMinn, L Browne and N McDonough, (unpublished). A multi-disciplinary study of the blue mussel seed resource in the north Irish Sea and ongrowing strategies for the Northern Ireland bottom mussel industry. Prepared for the Department of Agriculture and Rural Development for Northern Ireland.</p> <p>Policy 2004: Joint arrangements for management of seed mussel stocks in relation to Irish and Northern Ireland vessels http://www.aquacultureinitiative.eu/page24.html</p> <p>Strong, J.A. (2011). Mussel stock assessment: Ards Peninsula 2011, Northern Ireland. Agri-Food and Bioscience Institute, Northern Ireland.</p> <p>The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd.</p> <p>The Rising Tide Progress Report 2010-2011. 2011. A review of the Bottom Grown (BG) Mussel Sector on the Island of Ireland. Progress Report (Position at end of 2010).</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		

PI 1.2.2 – Harvest control rules & tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	<p>Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <p>Implicit within the management objectives for the seed mussel fishery is that the seed mussel beds are essentially ephemeral. As a result of the ephemeral nature of the seed mussel beds their harvesting has no impact on overall stock size (or a positive impact). With the above in mind, the management strategy is designed to manage the seed mussel fishery, and not to manage the wider mussel stock; therefore, conventional stock assessments with target and limit reference points, designed to ensure that the exploitation rate is reduced as limit reference points are approached, are not appropriate in this fishery. The fishery’s harvest strategy is aimed at managing the seed mussel fishery, and not the mussel stock as a whole.</p> <p>To implement the harvest strategy well defined harvest control rules are in place that are designed to determine if and when recruitments of seed mussels should be exploited. In the context of the seed mussel fishery, the “if” is based on surveys and habitat assessments and is contingent on at least 1,500 t of mussel seed being identified as being exploitable in the Irish Sea, while the “when” is based on the timing of suitable tides, the size and viability of seed (and associated survivability in transport) and the threat of loss of seed to predation (primarily starfish). Secondary management measures determine how the resource is best allocated between users such that re-laying areas are not adversely impacted. Harvest control rules are consistent with and act in support of the overall the harvest strategy.</p> <p>For the 2016 season, management authorities formalised the arrangements for the management of the mussel fishery. The management arrangements constituting the harvest control rules for the mussel fishery are as follows:</p> <ul style="list-style-type: none"> ▪ In early spring the BGMCF propose suitable tides for fishing mussel seed during the year. ▪ Proposed tides are approved by the Minister in IE or the Department in NI. ▪ If approved, suitable tides are set out in the mussel seed licenses/authorisations of both jurisdictions. ▪ In spring/summer BIM and AFBI conduct mussel seed surveys in their respective jurisdictions. ▪ Industry members may, with the appropriate permissions, conduct their own surveys and are obligated to report any “finds”. ▪ Seed mussel survey reports are published on the BIM and AFBI websites as they become available. ▪ The BGMCF has set a minimum quantity of 1,500t that must be identified as being exploitable in the Irish Sea before it recommends the opening of a fishery. ▪ If surveys identify at least 1,500t of exploitable mussel seed in the Irish Sea, BGMCF members, taking into account the results of the seed mussel surveys, make a recommendation to the Ministers proposing dates for mussel seed fishing to take place. ▪ In IE the Minister considers the recommendation from the BGMCF, survey results and other relevant information. In NI, the BGMCF’s recommendations are considered by DAERA. ▪ In IE, if the Minister decides that a mussel seed fishery should take place, his/her decision is given legal effect by means of a statutory instrument in which the fishing of mussel seed is 		

		<p>typically allowed for a defined period. In NI, DAERA may permit fishing for mussel seed in specific areas for a defined period.</p> <ul style="list-style-type: none"> ▪ Fisheries open on the specified time and date and are fished by appropriately licenced vessels. ▪ The fisheries remain open until 1) fishers have reached their allocation, 2) the date of closure is reached or 3) the fishery is closed early. ▪ In NI an early closure is triggered when the percentage of seed mussel to waste in catches reaches 50% or quantities of benthic substrata begin to be observed. ▪ In IE, industry members can, and do, recommend the closure of the fishery if in their view the resource is exhausted and further fishing would cause unnecessary damage to benthic ecosystems. <p>The harvest control rules for the fishery also include <i>force-majeure</i> provisions that allows for the BGMCF to recommend to the Ministers on a case-by-case basis the fishing of individual seed beds outside of agreed upon fishing seasons in situations where the seed is suitable for commercial fishing and is confirmed to be suffering predation from starfish. Such predation presents a management challenge for the seed mussel fishery, where a balance must be achieved between allowing seed to grow and harden (in order to maximise survival in transport) and protecting the seed resource from predators. Management arrangements include the following trigger points when starfish are detected in a seed mussel bed:</p> <ul style="list-style-type: none"> ▪ At a level of 10 starfish m⁻² the BGMCF should immediately consult with industry members and scientific advisors as to the course of action that should be pursued for the bed. ▪ At a levels of 20 starfish m⁻² <i>force majeure</i> should immediately be implemented and the bed opened on the earliest available tide <p>Following the formalisation of management arrangements, including <i>force majeure</i> provisions, the Assessment Team accepts that clearly defined harvest control rules, based on both firm procedural reference points and past experience of the fishery, are in place and that these are applied in managing the fishery. Furthermore, the Assessment Team is confident that rules are sufficiently formalised such that they should apply equally in all circumstances and should help ensure consistent outcomes regardless of differing biological, environmental and socioeconomic circumstances. The minutes of the BGMCF and the resulting letters and SMS messages to industry clearly document the above decision making processes.</p> <p>Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached; SG80 is met.</p>	
b	Guidepost	The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?	Y	N
	Justification	<p>The selection of the harvest control rules takes into account the main uncertainties.</p> <p>The key uncertainties in this fishery relate to temporal and spatial fluctuations in seed mussel availability and how long a successful recruitment of mussel seed will remain available to the fishery before it is either washed away or they are lost to predation. Harvest controls rules are designed with these uncertainties in mind and include sufficient flexibility to allow management deal with the main uncertainties.</p> <p>Harvest control rules allow managers to react in a timely manner to the appearance of mussel seed and determine how best to achieve the optimum yield from the available resource. In order to realise the optimum yield from a successful mussel spat fall, harvest control rules are designed to achieve a balance between allowing seed to grow and harden (in order to maximise survival in transport) and protecting the seed resource from predators.</p>	

		<p>Seed mussel survey reports include observations on the size and hardness of observed seed and recommendations from survey officers as to the potential viability of the seed and when the seed should be fished in order to best utilise the resource. Survey officers also report on the presence of predators on seed mussels and can recommend the activation of <i>force-majeure</i> in circumstances where they deem the seed to be under threat from predation and where the defined predator density thresholds have been met.</p> <p>Following the formalisation of management arrangements, including <i>force majeure</i> provisions, the Assessment Team accepts that selection of harvest control rules takes into account the main uncertainties. Consideration of the main uncertainties by harvest control mechanisms is evidenced by the minutes of BGMCF meetings, letters and SMS messages to industry and the use of <i>force majeure</i> provisions. Therefore, the selection of the harvest control rules takes into account the main uncertainties; SG80 is met.</p> <p>However, it is not possible to affirm that the harvest control rules take into account a wide range of uncertainties; SG100 is not met.</p>		
c	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	N
	Justification	<p>Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p> <p>The monitoring of fishing activity through “black boxes”, the SMS system and VMS on vessels and the recording of catches in log books is effective in controlling exploitation by ensuring compliance with limited entry regulations, seed mussel fishing seasons, and individual resource allocations. The closure of a seed mussel bed in NI when the mussel: waste ratio in the fishing gear drops below 50%, and the closure of the fishery following consultation with licence holders in IE when the seed are too small are effective tools which limit exploitation at times when the resource is scarce or is not suitable for re-laying. Therefore, available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules; SG60 and SG80 are met.</p> <p>Landings have been well below the maximum allowed catch (the sum of individual resource allocations) in the last few years due to lack of available seed. Data from SFPA show that the average resource allocation uptake in Ireland from 2004 – 2011 was 45.5% (Declan Quigley, SFPA, pers. comm.), so there is no available evidence in recent years that the resource allocation can indeed control exploitation rate. This would only be shown clearly if the overall resource allocation was lower than the biomass of available seed. Under the current harvest strategy this is unlikely to occur because the current harvest strategy is designed to provide sufficient seed mussel for re-laying on licensed cultivation sites within IE and NI on a continuous basis, and does not vary in relation to annual fluctuations in availability of seed mussels SG1100 is not met.</p>		
	References	<p>Policy 2004: Joint arrangements for management of seed mussel stocks in relation to Irish and Northern Ireland vessels http://www.aquacultureinitiative.eu/page24.html</p> <p>Strong, J.A. (2011). Mussel stock assessment: Ards Peninsula 2011, Northern Ireland. Agri-Food and Bioscience Institute, Northern Ireland.</p>		

	<p>The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd.</p> <p>The Rising Tide Progress Report 2010-2011. 2011. A review of the Bottom Grown (BG) Mussel Sector on the Island of Ireland. Progress Report (Position at end of 2010).</p> <p>Schedule of Arrangements Seed Mussel Fishery (Northern Ireland and the Republic of Ireland)</p> <p>Chronology of key actions around the 2016 Seed Season</p> <p>BGMCF meeting minutes</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		

PI 1.2.3 – Information & monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	<p>Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.</p> <p>There is a broad understanding of stock structure of mussels in the UoC and more widely throughout the Irish Sea and around the coast of the island of Ireland. The BIM, AFBI and Loughs Agency seed mussel surveys provide information on annual variation in mussel seed settlement and confirm that the main seed harvesting beds are ephemeral in nature. Through strong licensing regulations and four methods of monitoring fishing activity (Policy Document, 2004), the composition of the fleet and its daily fishing patterns are well understood. Therefore, sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy; SG60 and SG80 are met.</p> <p>Whilst there is some information available, it could not be considered to be comprehensive. Stock productivity can be measured from the BIM, AFBI and LA seed surveys, but there is a lack of detailed information on stock structure and stock abundance. In particular, the stock and recruitment dynamics of the mussel populations are not well understood. For example, little is known about the stable populations that are the likely source of the spat mussels which settle on the ephemeral beds from which seed mussels are harvested. In addition, there is no formal programme for the collection of relevant environmental information that might help to elucidate the major factors influencing mussel spat settlement. SG100 is not met.</p>		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N
	Justification	<p>Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.</p> <p>Seed mussel abundance on the main harvesting beds is estimated annually during surveys in both IE and NI. Fishery removals by all vessels participating in the fishery are monitored with a reasonable degree of accuracy through the completion of both spat mussel log books and EU log books.</p>		

PI 1.2.3		Relevant information is collected to support the harvest strategy	
		<p>Accurate regular monitoring of seed mussel abundance on the main seed harvesting beds is undertaken through annual surveys by BIM, AFBI and the Loughs Agency. These surveys describe the abundance, density and size composition of seed mussels on the main seed beds and are sufficient therefore to provide important input to more explicit harvest control rules than those currently in operation in the fishery. Fishing activity is very closely monitored on a daily basis in both IE and NI through spat mussel log books, EU log books, black boxes, the SMS system and VMS and regular inspections by the relevant enforcement agencies. These multiple indices are cross-checked for accuracy by SFPA and DARD and could provide the appropriate information for more robust harvest control measures than those currently in operation.</p> <p>Therefore, stock abundance and fishery removals are regularly monitored and this monitoring is conducted at a level of accuracy and coverage consistent with the harvest control rule. In addition, one or more indicators are available and monitored with sufficient frequency to support the harvest control rule; SG60 and SG80 are met.</p> <p>The inherent uncertainties in both the biomass estimates derived from the seed mussel surveys and the fishery removals data are not well understood, and management of the fishery does not incorporate these uncertainties; SG100 is not met.</p>	
c	Guidepost		There is good information on all other fishery removals from the stock.
	Met?		Y
	Justification	<p>There is good information on all other fishery removals from the stock.</p> <p>There are no other significant removals of seed or adult mussels on the Irish coast that would have any impact on stock dynamics. There is no wild mussel fishery on the Irish Sea coast. Genetic evidence suggests that there is very likely to be a single well-mixed population of <i>M. edulis</i> in the Irish Sea (Koehn et al., 1976), and there is detailed information available on the biomass of seed mussels harvested in the eastern Irish Sea for re-laying on the west coast of England and Wales (see MEC 2017 for details); SG80 is met.</p>	
References	<p>Chopin, A. (2011). Seed mussel survey report for Wexford and Rosslare areas, BIM survey report, 3 pp.</p> <p>Koehn, R.K., Milkman, R. and Mitton, J.B. 1976. Population genetics of marine Pelecypods. IV. Selection, migration and genetic differentiation in the blue mussel, <i>Mytilus edulis</i>. <i>Evolution</i> 30: 2-32</p> <p>MEC 2017. MSC Year 1 Annual Surveillance Audit of the North Menai Strait mussel fishery. Available at: https://fisheries.msc.org/en/fisheries/north-menai-strait-mussel/@assessments.</p> <p>Policy (2004). Joint arrangements for management of seed mussel stocks in relation to Irish and Northern Ireland vessels</p> <p>http://www.aquacultureinitiative.eu/page24.html</p> <p>Strong, J.A. (2011). Mussel stock assessment: Ards Peninsula 2011, Northern Ireland. Agri-Food and Bioscience Institute, Northern Ireland.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			

PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Default Y	
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
b	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Default Y		
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
c	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Default Y	Default Y	
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Default Y
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Default Y	Default Y
	Justification	According to CR v1.3 Table CC1, off the RBF is used to score PI 1.1.1 a default score of 80 must be given to this PI. Therefore, the bottom grown mussel fishery has not been scored against the default Scoring Guidepost and an overall 80 score has been assigned to the PI.		
References		MSC CR v1.3.		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

8.1.1.2. Principle 2 – Environmental Impact of Fishing – Evaluation Tables
PI 2.1.1 – Retained species (Outcome)

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	Y
	Justification	According to MSC CR v1.3 CB3.2.1: "If a team determines that a fishery has no impact on a particular component, it shall receive a score of 100 under the Outcome PI." There are no Main and no Minor Retained species therefore the fishery does not impact the Retained species component; a default score of 100 is awarded for this PI.		
b	Guidepost			Target reference points are defined for retained species.
	Met?			Y
	Justification	According to MSC CR v1.3 CB3.2.1: "If a team determines that a fishery has no impact on a particular component, it shall receive a score of 100 under the Outcome PI." There are no Main and no Minor Retained species therefore the fishery does not impact the Retained species component; a default score of 100 is awarded for this PI.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	According to MSC CR v1.3 CB3.2.1: "If a team determines that a fishery has no impact on a particular component, it shall receive a score of 100 under the Outcome PI." There are no Main and no Minor Retained species therefore the fishery does not impact the Retained species component; a default score of 100 is awarded for this PI.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	According to MSC CR v1.3 CB3.2.1: "If a team determines that a fishery has no impact on a particular component, it shall receive a score of 100 under the Outcome PI." There are no Main and no Minor Retained species therefore the fishery does not impact the Retained species component; a default score of 100 is awarded for this PI.		
References		MSC CR v1.3.		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				

PI 2.1.2 – Retained species (Management)

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
Met?		Y	Y	Y
Justification		<p>There is a strategy in place for managing retained species.</p> <p>“Retained” species are defined by the MSC as those species that are caught by the UoA and are landed by the vessel. Species are classed as retained even if they have no commercial value. “Main” retained species are defined by the MSC as those that make up 5% or more of the total catch (in weight), unless the retained species have a high value, are vulnerable, or the total volume retained is large (<i>MSC GCR GCB3.5.2</i>). In addition, the MSC specify that only those parts of the catch that are not assessed under Principle 1 should be assessed under Principle 2 (<i>MSC CR at §CB3.8.1</i>).</p> <p>As the UoC has no main retained species, this PI meets the SG60 and SG80 scoring guideposts. Additional information pertaining to retained species management is given below.</p> <p>In the context of this PI a “strategy” represents: <i>“a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically (...)”</i> (CR v1.3 GCB3.3).</p> <p>There is a strategy in place that manages the fishery practice of not retaining anything other than mussels that can be described as follows:</p> <ul style="list-style-type: none"> ▪ Vessels are licensed for mussel or bivalve fishing (extraction of seed) and are subject to National and European fishery regulations. ▪ The fishery is an enhanced mussel fishery and vessels use modified dredges specifically for targeting mussels. ▪ The fishery (vessel layout, catch composition etc.) is not conducive to retention of other species in a manner that would be commercially viable (i.e. there is no incentive to retain non-target species whose retention is not specifically prohibited). ▪ In the seed portion of the fishery, vessels specifically target seed mussel beds known to produce low levels of non-target species and in any case everything is re-laid (i.e. the entire catch including the target species is not retained). ▪ In the harvest portion of the fishery, market-sized mussels are harvested from cultivation beds within defined licensed areas, harvests are subject to both reporting requirements and possible inspection. <p>Therefore there is a cohesive, deliberate and effective management strategy in place that manages the fishery practice of not retaining anything other than mussels. This 'strategy' can be considered to be inherent in how the fishery operates (leading to 'negligible' retained species) and is supported and backed up by on-going monitoring and oversight; SG 100 is met.</p>		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y
	Justification	<p>Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.</p> <p>As the UoC has no main retained species, this PI meets the SG60 and SG80 scoring guideposts. Additional information pertaining to retained species management is given below.</p> <p>There is an objective basis for confidence that the UoC does not pose a risk of serious or irreversible harm to retained species based on the available information (e.g. seed mussel surveys, bycatch sampling, logbook reporting, inspections, level of compliance exists with statutory spatial controls etc.). According to MSC CR v1.3 Table AA1, testing can include “<i>practical experience of performance or evidence of past performance</i>”. It can be demonstrated, from practical experience of the fishery, through on-going monitoring and oversight, that there are no retained species other than those considered ‘negligible’ in line with the MSC’s CB3.5.3. ‘Testing’ therefore supports high confidence that the strategy, based on information directly about the fishery and/or species involved; SG100 is met.</p>		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	<p>There is clear evidence that the strategy is being implemented successfully.</p> <p>As the UoC has no main retained species, this PI meets the SG80 scoring guidepost. Additional information pertaining to retained species management is given below.</p> <p>Vessel inspections/seed harvest and crop harvest records provide clear information that no other species are retained. Official harvest records provide clear evidence that no other species are retained. They are required to fill in two logs. The EU logbook model and hence by law would be required to declare the retention of any other commercial species and a Mussel Spat Logbook for seed and a Gatherers Registration for harvestable mussels (relating to hygiene and forming a record of traceability). This is clear evidence that the strategy is being implemented successfully, therefore SG100 is met.</p>		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	<p>There is some evidence that the strategy is achieving its overall objective.</p> <p>There is evidence that the strategy of a highly specialized fishery with the controls that are established is achieving its overall objective of not retaining other species as detailed in SIc above. Therefore, SG 100 is met.</p>		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
	Met?	Not relevant	Not relevant	Not relevant
	Justification	There is no evidence that sharks are captured in the UoA. This scoring issue is not relevant and has not been scored.		
References		NA		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				

PI 2.1.3 – Retained species (Information)

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	Y
	Justification	<p>Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.</p> <p>As the UoC has no main retained species, this PI meets the SG60 and SG80 scoring guideposts. Additional explanation pertaining to retained species information is given below.</p> <p>There are routine inspections of mussel seed harvests prior to transfer that can confirm there are no retained species and hence no other retained species mortalities. There are official logbooks for harvesting of seed and harvest size mussels. Harvestable mussels are documented in logbooks which are submitted to the regulator, a copy is retained and subject to inspection and; additionally, hygiene inspections are carried out on vessels and harvests to ensure food safety regulations are met. Harvested mussels are handled by purpose built vessels and at purpose built plants that are developed for bulk handling. These facilities are also subject to routine inspections. The assessment team is satisfied that monitoring occurs throughout these operations; although not designed to monitor retained species per se (as none occur) they are sufficient enough to confirm that if this were to occur they would be detectable and sufficient enough to monitor these.</p> <p>During SICA meetings it was established that the fishery does not retain any other species except the targets species for commercial gain. The citing of official reports and communication with government officials did not reveal any contradictory information and thus the assessment team is confident that the information is accurate and verifiable and SG 100 is met.</p>		
b	Guidepost	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	<p>Information is sufficient to estimate outcome status with respect to biologically based limits.SG</p> <p>As the UoC has no main retained species, this PI meets the SG60 and SG80 scoring guideposts. Additional explanation pertaining to retained species information is given below.</p> <p>From information provided by BIM and DAERA (i.e., logbook data) and the regular seed surveys, bycatch sampling and impact assessments for the Natura 2000 sites, it can be concluded that the UoA does not adversely affect the status of non-target species with respect to biologically based limits. There is not sufficient information to quantitatively estimate the outcome status of all retained species with a high degree of certainty to meet SG100, therefore SG 100 is not met.</p>		
c	Guidepost	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species	
	Justification	<p>Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.</p> <p>Information is adequate to support a comprehensive strategy to manage the absence of retained species and evaluate with a high degree of certainty whether the strategy is achieving its objectives (Refer to supporting evidence for SIa above); therefore SG 100 is met.</p>	
d	Guidepost	Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?	Y	Y
	Justification	<p>Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.</p> <p>No monitoring of retained species is required per se, as none are caught by this fishery. However, there is sufficient monitoring of seed and harvested mussels. Therefore, SG 100 is met.</p>	
References		NA	
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant):			

PI 2.2.1 – By-catch species (Outcome)

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	Y
	Justification	<p>The Default Assessment approach could not be used as there is no stock assessment of and no biological reference points for the management of bycatch species recorded in the both seed mussel fishery and in on-growing areas. Therefore, the RBF was used to evaluate the impact of the fishery on stocks of bycatch species within the UoA area. In fact two RBF analyses of bycatch species were carried out, one for activities associated with the seed mussel fishery and one for activities within the on-growing areas. Note as this is a MSC CR v1.3 assessment RBF analyses were conducted according to the process outlined in Annex CC of MSC CR v1.3.</p> <p>Bycatch RBF 1 – Seed mussel fishery Spider crab (<i>Maja brachydactyla</i>) was the only species identified in the seed mussel areas as being a Minor Bycatch species for the purpose of this assessment.</p> <p>Given all the evidence examined, stakeholders were of the opinion that the activities of the bottom grown mussel fishery were likely to result in, at most insignificant changes to spider crab population size and/or growth rate (r). In addition any changes are not likely to be detectable against background variability for the population. Therefore, it was considered appropriate to award a SICA consequence score of 1.</p> <p>The resulting consequence score of 1 was converted to an MSC score using the scoring conversion in Table CC14 resulting in an MSC equivalent score of 100; as the SICA score was ≥80 a further PSA was not required.</p> <p>Bycatch RBF 2 – On-growing areas Green crab (<i>Carcinus maenas</i>) was the only species identified in the harvest areas as being a Minor Bycatch species for the purpose of this assessment with all other recorded species being present at lower levels.</p> <p>Given the evidence examined, stakeholders were of the opinion that the activities of the bottom grown mussel fishery were likely to result in, at most insignificant changes to green crab population size and/or growth rate (r). In addition any changes are not likely to be detectable against background variability for the population. Therefore, it was considered appropriate to award a SICA consequence score of 1.</p> <p>The resulting consequence score of 1 was converted to an MSC score using the scoring conversion in Table CC14 resulting in an MSC equivalent score of 100; as the SICA score was ≥80 a further PSA was not required.</p>		
b	Guidepost	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups	
	Justification	The RBF was used to score this PI. For further details see rational for Sla above.	
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.	
	Met?	Y	
	Justification	The RBF was used to score this PI. For further details see rational for Sla above.	
References		The RBF was used to score this PI. For further details see rational for Sla above.	
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			

PI 2.2.2 – By-catch species (Management)

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	<p>As the UoC has no main bycatch species, this PI meets the SG60 and SG80 scoring guideposts. Additional information pertaining to bycatch species management is given below.</p> <p>“Measures” are defined by the MSC as individual management actions or tools which may manage impacts either deliberately or coincidentally; a “partial strategy” is a cohesive set of measures that work together (either deliberately or coincidentally) to achieve a management outcome; and a “strategy” is a cohesive, deliberate and effective management approach designed to addressing unacceptable impacts (further details are given in the MSC GCR at §GCB3.3).</p> <p>Bycatch levels were estimated during the SICA workshops to lie below 1% of the total biomass of the catches by fishers and government officials conducting the seed surveys. Thus none of the species caught as bycatch did qualify as a main by-catch species which has to comprise 5% of the total catch.</p> <p>At a fishery level, management measures and have been established that reduce the level of bycatch species in the UoA’s catch. Management measures include statutory controls on the design of fishing gear, spatial and temporal distribution of fishing activities (enforced using a vessel “black box”), and catch inspections.</p> <p>Management measures at both a national and EU level constitute a partial strategy for managing bycatch species. However, SG100 is not met because there is no evidence of a strategy to specifically manage and minimize bycatch.</p>		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	<p>There are considered to be no main bycatch species in the UoC that make up more than 5% or more of the catch, thus the SG60 and SG80 scoring guideposts are achieved.</p> <p>There is an objective basis for confidence that the fishery does not pose a risk of serious or irreversible harm to bycatch species from information provided by industry (fishers and processors) and independent government sources (research survey results).</p> <p>Much of the fishing areas are closed to fishing, and fishing operations occur within finite areas that yield high densities of high quality mussels and further reduce the impact of the fishery on discarded (bycatch) species. Bycatch levels are estimated to lie below 1% and therefore, there is some objective basis for confidence that the partial strategy will work.</p>		

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations	
		However, there is no strategy to specifically manage and minimize bycatch and as such there is no evidence of testing supporting high confidence that the strategy will work, based on information directly about the fishery and/or species involved; SG100 is not met.	
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.
	Met?	Y	N
	Justification	Bycatch levels are estimated to lie below 1% and therefore there is no need for a partial strategy to manage bycatch levels. There are considered to be no main bycatch species, thus the SG80 scoring guidepost is met. However, there is no strategy to specifically manage and minimize bycatch and as such there is no clear evidence that the strategy is being implemented successfully; SG100 is not met.	
d	Guidepost		There is some evidence that the strategy is achieving its overall objective.
	Met?		N
	Justification	The absence of a management strategy or overall objective for bycatch species prevents the UoA from meeting SG100; SG100 is not met.	
References		<p>Davies, L. C. R., (2003). An Assessment of bycatch from the common mussel (<i>Mytilus edulis</i>) seed dredge fishery in the southwest Irish Sea. MSc thesis, University College Cork.</p> <p>The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd.</p> <p>Fahy E, Carroll J, O'Toole M, Barry C and Hother-Parkes L, 2005 Fishery associated changes in the whelk <i>Buccinum undatum</i> fishery in the south west Irish Sea. Irish Fisheries investigation Number 15.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

PI 2.2.3 – By-catch species (Information)

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	<p>Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.</p> <p>Qualitative and some quantitative information with respect to by-catch species at mussel seed fishing sites is available through the survey reports by respective governmental bodies (ABFI and BIM) and through an additional dedicated bycatch study; SG60 and SG80 are met.</p> <p>However, bycatch information has not been systematically collected due to the fact that catch and bycatch, after seed collection, are not being separated but instead are relayed over the cultivation sites and the fact that with bycatch levels below 1%, this issue has not been identified as a major concern. Therefore, accurate and verifiable information on the catch of all bycatch species and the consequences for the status of affected populations is not available; SG 100 is not met.</p>		
b	Guidepost	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Scoring issue need not be scored when RBF used to score PI 2.2.1		
c	Guidepost	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	<p>Information is adequate to support a partial strategy to manage main bycatch species.</p> <p>The information available did indicate that due to the low levels of bycatch made by this fishery (below 1%) and no 'main bycatch species' present no direct partial strategy appears to be required.</p> <p>The assessment team was provided with the results of the bycatch program carried out during the fishing season of 2016 and 2017 and is planned to continue over the years to get more accurate information of the composition of total catches by the fishery in both areas, seed beds and harvest areas. Therefore this bycatch program will be a partial strategy in the fishery to monitor the non- target species although the bycatch is low and in the list of species there is no main bycatch, all the species identified are in percentages below 5 %.</p>		

PI 2.2.3	Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
	<p>Therefore while there are no main bycatch species and as such a partial strategy to manage them is not required, the assessment team can confirm that information is adequate to support a partial strategy to manage main bycatch species should one become necessary; SG60 and SG80 are met.</p> <p>However, it is unlikely that information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective; SG100 is not met. Note the low level of risk posed to bycatch species by this fishery means that expanding bycatch surveys to levels where data would be sufficient to evaluate whether a strategy (if one were necessary) would likely be of limited utility.</p>		
d	Guidepost	Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?	Y	N
	Justification	<p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p> <p>At the 3rd surveillance audit of the original certification cycle the assessment team were provided with the bycatch monitoring results and the bycatch sampling plan. This bycatch program has specific objectives that are listed below:</p> <ul style="list-style-type: none"> • Quantify the biomass and relative contribution of all species retained in the mussel seed fishery and harvest areas • Identify any bycatch species and their contribution to the total catches • Compare mussel bycatch in Ireland and Northern Ireland with other mussel fisheries <p>During the winter seasons of 2016 and 2017 the seed beds were sampled by BIM personnel and the harvest areas were sampled by the industry, the members were allowed to sample the areas where they have a license to harvest. Therefore quantitative data are now available and it is planned to continue during 2018 with the same methodology which is described in the bycatch sampling plan. The appendix 4 shows more details regarding the species composition reported in the bycatch monitoring report.</p> <p>In Northern Ireland, DAERA and AFBI have carried out the surveys in Burial Island Seed and Feathers Seed to control the species composition. The data are reported to SFPA and BIM. The assessment team has been provided with the reports in which the results of the samples and composition of those are detailed.</p> <p>In comparison with the results showed during the full assessment, now the fishery has quantitative data of bycatch composition and should be monitored over the years to detect any change, in the populations of these species, caused by the impact of the fishery. Therefore, sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy); SG60 and SG80 are met.</p> <p>The bycatch monitoring programme is newly established and as yet it is not clear whether monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species; SG 100 is not met.</p>	

PI 2.2.3	Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch
References	<p>Davies LCR 2003 An Assessment of bycatch from the common mussel (<i>Mytilus edulis</i>) seed dredge fishery in the southwest Irish Sea. MSc thesis, University College Cork</p> <p>The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd.</p> <p>Fahy E, Carroll J, O'Toole M, Barry C and Hother-Parkes L, 2005 Fishery associated changes in the whelk <i>Buccinum undatum</i> fishery in the south west Irish Sea. Irish Fisheries investigation Number 15.</p> <p>Beadman, HA, Caldow RWG, Kaiser MJ, Willow RI, 2004. How to toughen up your mussels, using shell morphology plasticity to reduce predation loss. <i>Marine Biology</i> 142, 487-494</p> <p>AFBI Report The improved characterisation and quantification of mussel seed beds around the Island of Ireland.</p> <p>AFBI. Stock assessment reports. BIM seed mussel survey reports</p> <p>Bycatch monitoring report Seed and harvest Areas 2016</p> <p>MSC Bycatch Sampling Plan 2016</p>
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	NA

PI 2.3.1 – ETP species (Outcome)

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
y	Guidepost	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	Y
	Justification	<p>There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.</p> <p>The MSC define Endangered Threatened & Protected (ETP) species as those that are recognised by national ETP legislation and those species that are listed in Appendix 1 of the Convention on International Trade in Endangered Species (CITES).</p> <p>The main group of relevant ETP species that was identified by the assessors as having a significant potential of interacting with the activity of the mussel fishery during cultivation where identified as wading and waterfowl birds. Activities such as bottom mussel culture require a test of significance/screening and an Appropriate Assessment if required for licensing in or adjacent to a protected area. Seed fishing is closed in sites that are require appropriate assessment. Fishing can take place in these areas but only if the area has undergone an appropriate assessment or the skipper has been granted a NATURA Permit to fish within or adjacent to these Natura 2000 designated/proposed areas. SG60 and SG80 are met.</p> <p>ICES has not identified mussel dredging as a fishing activity with the potential to adversely affect ETP species. Therefore, based on the information provided about the UoC and the distribution and abundance of ETP species within the fishing areas, there is a high degree of certainty that the effects of the UoC are within limits of national and international requirements for the protection of ETP species; SG100 is met.</p>		
b	Guidepost	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	Y
	Justification	<p>There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.</p> <p>The direct and indirect effects of the fishery are assessed on a regular basis by test of significance/screening and Appropriate Assessments as described in supporting evidence for Sla above. Therefore, there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species; SG60, SG80 and SG100 are met.</p>		
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	Y

PI 2.3.1	The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species	
	Justification	<p>There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.</p> <p>The Natura 2000 sites are key areas for ETP species within the UoC fishing areas. The assessment of indirect impacts of the UoC (e.g. competition for prey, disturbance of critical habitat) is assessed on a regular basis within the Natura 2000 sites by BIM and DAERA. The outcome from these regular assessments determines whether the UoC is permitted to operate within these areas each year. There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species; SG80 and SG100 are met.</p>
References	CITES, 2016; ICES, 2016, relevant appropriate assessments and tests of significance	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		NA

PI 2.3.2 – ETP species (Management)

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	N
	Justification	<p>There is a strategy in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>The key areas for ETP species in IE have been identified by respective statutory conservation agencies and have been designated as SAC’s, SPA’s, national protected sites and as Ramsar sites under international regulation. Key ETP species are in the main wading birds and waterfowl protected by Natura 2000 designations which occur in the mussel on-growing locations both in IE and N. Ireland and have been summarized in the background information. Seed extraction for bottom mussel culture also require a test of significance/screening and an appropriate assessment if required for licensing when occurring in or adjacent to a protected area and this requires a management plan to avoid or mitigate any adverse effects on the identified species or features under this legislation.</p> <p>Therefore, there is a strategy in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species; SG60 and SG80 are met.</p> <p>There are no currently no comprehensive strategy in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species; SG100 is not met.</p>		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N
	Justification	<p>There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.</p> <p>IE and NI have both developed a clear framework for the management of SAC sites from a scientific perspective which demonstrates conformity to this guidepost. From the documentation of the appropriate assessments conducted thus far (see 80a) it is clear that the strategy followed is highly likely to work and therefore succeed in achieving national and international standards with respect to ETP species; SG60 and SG80 are met.</p>		

PI 2.3.2	The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 		
	While the strategy is mainly based on information directly about the fishery and/or species involved, a quantitative analysis that supports high confidence that the strategy will work has not been carried out; SG 100 is not met.		
c	Guidepost		There is evidence that the strategy is being implemented successfully.
	Met?	Y	N
	Justification	<p>There is evidence that the strategy is being implemented successfully.</p> <p>There is evidence in form of several tests of significance/screening and appropriate assessments for seed bed fishing and for cultivation areas that have been completed that this strategy should be successful. Furthermore, there are plans to complete all required assessments within the coming years, however, this has not been publicly formalized and no binding time line exists; SG80 is met.</p> <p>However, until all necessary appropriate assessments have been completed it cannot be said that there is clear evidence that the strategy is being implemented successfully; SG100 is not met.</p>	
d	Guidepost		There is evidence that the strategy is achieving its objective.
	Met?		Y
	Justification	<p>There is evidence that the strategy is achieving its objective.</p> <p>The regular appropriate assessments and tests of significance, which review fishing impacts and the conservation status of ETP species within the Natura 2000 sites, demonstrate that the strategy is achieving its objective; SG100 is met.</p>	
References	Council Directive 92/43/EEC (the “Habitats Directive”); Directive 2009/147/EC (the “Birds Directive”); Appropriate assessments.		
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			

PI 2.3.3 – ETP species (Information)

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	<p>Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.</p> <p>There is sufficient evidence from the test of significance/screening and appropriate assessment completed to date and studies conducted in other areas to estimate the impact of this fishery on ETP species, in particular wading birds and waterfowl.</p> <p>Information on bird distributions in relation to the fishery have been collected for Lough Foyle, Carlingford Lough, Lough Swilly, Belfast, Castlemaine. Thus only Wexford, Youghal and Waterford have limited data to quantitatively estimate potential impacts. Considering that the risk has been assessed for the main cultivation areas and there is an overall low risk to ETP species as outlined below under 80b this issue was scored with a yes. Furthermore, there is a legal obligation on the competent authority to carry out assessments for remaining sites including ETP species in Larne, Wexford, Youghal and Waterford. The cultivation areas that underwent appropriate assessments did demonstrate that sufficient data on the distribution of birds was available to manage potential impacts.</p> <p>Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species; SG60 and SG80 are met.</p> <p>However, gaps in quantitative information on distribution and population trends of ETP species in relation to this fishery for some areas and appropriate assessments have yet to be published for all on-growing areas. Information is not currently sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty; SG100 is not met.</p>		
b	Guidepost	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	<p>Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.</p> <p>The tests of significance/screening reports and appropriate assessments completed thus far do seem to indicate that the necessary data is available to support measures that mitigate the impact on ETP species. The cultivation areas that were appropriately assessed had sufficient data to determine potential impacts or threats to ETP species. Overall, mortality levels to ETP species have been judged non-threatening to their protection and recovery in the context of the spatial and temporal scale of this activity and the experience from other similar fisheries in other areas. For areas that have yet to be assessed, it would seem likely that the risks would be of a similar</p>		

PI 2.3.3	Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 			
	<p>acceptable level with respect to presenting a threat to the protection and recovery of ETP species designations.</p> <p>Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species; SG60 and SG80 are met.</p> <p>However, accurate and verifiable information is not available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species; SG100 is not met.</p>			
c	Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N
	Justification	<p>Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.</p> <p>The tests of significance/screening reports and appropriate assessments completed thus far do seem to indicate that the necessary data is available to support the measures that do mitigate the impact on ETP species. The cultivation areas that underwent the required level of assessment did demonstrate that sufficient data on the distribution of birds and habitats was available to manage potential impacts within a full strategy. For remaining areas, it is reasonable to assume the information is comparable and hence is considered sufficient to support a full strategy; SG60 and SG80 are met.</p> <p>The information available in the areas where appropriate assessments have been carried out would appear to be sufficient for a comprehensive strategy that manages lethal and sub-lethal effects on ETP and can be evaluated with a high degree of certainty. However the same cannot be said for areas where appropriate assessments have not yet been completed; SG100 is not met.</p>		
	References	<p>Appropriate Assessment Castlemaine Harbour: http://www.fishingnet.ie/media/fishingnet/content/fisheriesinnaturaareas/fisheriesnaturaplanconsultations/AA_Castlemaine_2011_FINAL.pdf</p> <p>Crowe et.al. (2011) A framework for managing sea bed habitats in near shore Special Areas of Conservation Department of the Environment, Heritage and Local Government, Ireland.</p> <p>Caldow RWG, Beadman HA, McGoroty S, Kaiser MJ, Gross-Custard JD, Mould K and Wilson A, 2003 Effects of intertidal mussel cultivation on bird assemblages. Marine Ecology Progress Series 259, 173-184.</p> <p>Beadman HA, (2004) Ecological impact of mussel culture in the Menai Strait, North Wales, PhD thesis, University of Wales, Bangor.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

PI 2.4.1 – Habitats (Outcome)

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	<p>The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>Fishing mussel seed will have a limited impact on the underlying habitat as the modified Dutch dredges used are deployed to only skim the surface to remove mussels instead of the digging into the underlying sediment. As mussels are located on top of a layer of soft mussel mud the impact on underlying habitat structure is further limited. The amount of debris caught is continuously monitored by mussel boats as it is not in their interest to catch any debris. In NI catches are also inspected by fisheries enforcement for the amount of inert material. The dredges that are predominantly used by the fishery have been modified from the original Dutch design to be lighter and to avoid the capture of large stones. The impact will be detectable but recovery is likely to have occurred within one year.</p> <p>Relaying of mussel will change the soft sediment habitat type at the cultivation site into a mussel bed that produces mussel mud. Faunal components of the original soft sediment habitat therefore will change as a consequence. Changes may be detectable in some bays due to local hydrodynamics but time to recover not beyond a year. Habitat structure and function on a regional level is not impacted.</p> <p>The Aquaculture license granting process requires assessment prior to licensing to confirm non long term impact. Licenses are capped on total amount re-laid. Specially modified Dutch dredges are used for relaying and harvest. These dredges tend to be lighter compared to the dredges used for seed mussel collection. Mussels are fished by skimming over the seabed surface aiming to avoid the dredges digging into the underlying sediment. As mussels are located on top of a layer of soft mussel mud the potential impact on underlying habitat structure is further limited. It is expected that if the mussel lays would be removed from cultivation sites, the sites would return to their previous state within a year.</p> <p>The spatial extent of the fishery is so limited that the fishery’s impacts (considered on a regional or bioregional basis as is required here) are highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm; SG60 and SG80 are met.</p> <p>Since all the Natura 2000 sites within the UoA are not monitored, it cannot be said that there is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm; SG100 is not met.</p>		
References		Council Directive 92/43/EEC (the “Habitats Directive”)		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

PI 2.4.2 – Habitats (Management)

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	N
	Justification	<p>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</p> <p>The principle measures to manage the impact of the fishery on the habitat are licensing of cultivation areas, a restricted fishing season and areas open or closed to fishing translating into a relatively small temporal and spatial scale of the fishing activity for both seed harvesting and cultivation. The fishing gear has been modified by the industry to be less impactful and exclude the capture of large stones.</p> <p>Seed fishing For both IE and NI waters of the UoC where a designation exists, seed fishing is not allowed unless a test of significance/screening and appropriate assessment if required is first undertaken.</p> <p>In NI designated areas, a mussel seed survey is in place that uses acoustic survey techniques combined with ground truthing techniques. Located seed mussel beds are screened for their suitability for exploitation taking into account potential impacts on protected habitats, ETP species or specifically listed conservation features. This screening process is more likely to determine if the seed mussel bed is ephemeral.</p> <p>In IE, all designated areas have remained closed to seed fishing except in one case, Cromane (Castlemaine) where a similar regulatory approach to seed collection has been implemented for designated areas under Natura 2000, seed surveys are employed by BIM to help the industry find mussel seed. Some expert judgment over the suitability of the seed beds is made in these scientifically surveyed areas but there is not a clearly defined process linked to sensitive habitat conservation where all mussel seed beds open to the fishery are systematically screened and no clear decision matrix exists to close or open seed beds outside of the current designated areas.</p> <p>Due to the fact that for NI, all seed fishing has taken place within or sufficiently adjacent to designations to warrant an assessment prior to opening, habitat status is explicitly protected. In IE whilst the same requirement exists, for non-designated seed sites, there is not the same explicit requirement for scientific screening prior to fishing. The Natura 2000 designations have been implemented post scientific assessment of the coastline of IE and hence, the unit of certification area and additional survey reports have been undertaken which support a rationale that sufficient knowledge exists to confirm that designations are sufficiently in place to protect sensitive habitats and that it is unlikely that seed fishing to date has occurred in areas that has caused irreversible damage to sensitive habitats (e.g. seed over cobble reefs or mixed with <i>Modiolus moliolus</i> reefs) and the potential that overwintering mussel seed beds are being exploited (i.e. with relevant habitat and ecosystem effects).</p> <p>However, a systematic screening process of all seed mussel beds prior to exploitation has been recommended by several reports produced for this fishery (Crowe et. al. 2011, Maguire et.al. 2007).</p>		

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
		<p>Cultivation Sites</p> <p>Mussel cultivation sites are licensed and strictly regulated. Licensing procedures aim to limit the fishery to specific locations and to prevent an uninhibited spread to other area less suitable for cultivation from an environmental point of view. Licenses are being released by the respective governmental bodies on the basis that these fisheries are being conducted in a manner that are conducive to the terms stipulated in the licensing. The degradation of the habitat would constitute a breach of the license agreement. Thus, this licensing scheme represents a formal strategy to mitigate the impact of this fishery on habitats on a regional and local scale.</p> <p>The combination of measures outlined above constitute a partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above; SG60 and SG80 are met.</p> <p>There is nothing currently in place that represents a strategy (as defined in the MSC CR) for managing the impact of the fishery on habitat types; SG100 is not met.</p>		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N
	Justification	<p>There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.</p> <p>At the 3rd surveillance audit of the original certification cycle the assessment team was provided with documentation which verifies that there is data directly from the fishery to evaluate the possible impacts of the fishery in the habitats.</p> <p>The assessment team has been provided with the seed surveys in IE and NI, the measures to open and close the fishery are established depending on scientific advice which determines when the tonnes of seeds are sufficient to allow the fishery. The fishery has to communicate with the management bodies; the schedule of arrangements decides all the relevant aspects of the fishery and must be reported by SMS. Therefore, the assessment team can confirm that documentary evidence was presented which indicated that a strategy has been implemented successfully to ensure that the fishery does not pose a risk to habitat types. This strategy has been assessed and found to be sufficient to protect vulnerable habitats. The monitoring of seed fisheries is ongoing and the management of the seed fishery is active. This is considered sufficient to ensure the protection of vulnerable habitats and therefore, there is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved and SG60 and SG80 are met.</p> <p>To meet SG100 the testing must support high confidence that the strategy will work. SG 100 is not met as there is only a partial strategy in place.</p>		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	<p>There is some evidence that the partial strategy is being implemented successfully.</p> <p>There is some evidence that the partial strategy is being implemented successfully refer to supporting evidence for SIb above; SG60 and SG80 are met.</p>		

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
		As a strategy (as defined in the MSC CR) is not in place there is not clear evidence that such a strategy is being implemented successfully; SG100 is not met.	
d	Guidepost		There is some evidence that the strategy is achieving its objective.
	Met?		N
	Justification	A strategy (as defined in the MSC CR) is not in place and therefore there is not clear evidence that such a strategy is being implemented successfully; SG100 is not met.	
References		<p>Dredging impacts literature review by Aquaculture initiative 2009 – unpublished</p> <p>The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd.</p> <p>INFOMAR Report. The improved characterisation and quantification of mussel seed beds around the Island of Ireland.</p> <p>BIM seed mussel survey reports</p> <p>Appropriate Assessment Castlemaine Harbour: http://www.fishingnet.ie/media/fishingnet/content/fisheriesinnaturaareas/fisheriesnaturaplanconsultations/AA_Castlemaine_2011_FINAL.pdf</p> <p>AFBI report Dredging of Seed Mussel adjacent to the Outer Ards Peninsula SPA and the Copeland Island SPA</p> <p>AFBI seed mussel survey reports; 2007 Baseline Survey of the Shellfish Resources of Lough Foyle 2008 Seed Mussel Bed Survey Co. Down 2010 Donaghadee Sound seed mussel survey V1 2011 AFBI Seed mussel stock survey ABFI (2010). Dredging for Seed Mussels within Donaghadee Sound DARD seed mussel fishery surveillance reports</p> <p>Maguire, JA, T Knights, G Burnell, T Crowe, F O’Beirn, D McGrath, M Ferns, N McDonough, N McQuaid, B O’Connor, R Doyle, C Newell, R Seed, A Small, T O’Carroll, L Watson, J Dennis, and M O’Cinneide, 2007. ‘Management Recommendations for the sustainable exploitation of mussel seed in the Irish Sea’. Marine Environment and Health Series. 3.1.</p> <p>Outer Ards Seed Mussel Stock Assessment, 2016. AFBI</p> <p>Seed Mussel Surveys report for 2017. BIM</p> <p>Report Supporting Appropriate Assessment of the impact of seed mussel fishing and relaying on Castlemaine Harbour SAC and SPA. Marine Institute</p> <p>Burial Island and the feathers video Survey. June 2016 AFBI.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			

PI 2.4.3 – Habitats (Information)

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	<p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>There are variable levels of spatial detail but overall there is a good understanding of what habitats occur in the area of the fishery. Generally this is true, as a great amount of data has been collected through seed assessment surveys using acoustic methods and other more specific habitat surveys. Thus, the general distribution of habitats and their vulnerability will be known. As ephemeral mussel seed beds tend not to occur in exactly the same locations but in nearby locations each year, there is a small risk that some gaps in the knowledge over habitat may exist but not relevant to the scale and intensity of the fishery (refer to 80c).</p> <p>The distribution of all main habitats is known at a relevant scale within cultivation areas, therefore SG60, SG80 and SG100 are met.</p>		
b	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	<p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.</p> <p>There is a good understanding of the spatial overlap of habitats with this fishery. Fishing vessels during seed collection and cultivation are required by legislation to carry a black box that monitors vessel movement. The impact of mussel dredges is in principle understood. However, while the precise configuration of all the dredge types used in this fishery have not been scientifically tested in these fisheries it is possible to draw conclusions from the general design, fishing practices adopted and a large amount of relevant literature.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear; SG60 and SG80 are met.</p> <p>While the spatial and temporal extent of the fishery and its impact on habitats has been established, it cannot be said that the physical impacts of the gear on the habitat types have been fully quantified; SG100 is not met.</p>		

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types	
c	Guidepost	Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?	Y	N
	Justification	<p>Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>At the 3rd surveillance of the original certification cycle the assessment team was provided with sufficient information to confirm that the fishery is collecting data of habitats to ensure that any risk can be identified. Therefore, documentary evidence was presented that indicated that a data collection programme was in place and that this information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types. Data collection is ongoing and adaptive to any new issues raised.</p> <p>Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures); SG 80 is met.</p> <p>While data continue to be collected, changes in habitat distributions over time are not explicitly measured; SG100 is not met.</p>	
References		<p>AFBI Report. The improved characterisation and quantification of mussel seed beds around the Island of Ireland.</p> <p>AFBI (2011) Stock assessment report</p> <p>BIM seed mussel survey reports</p> <p>AFBI report Dredging of Seed Mussel adjacent to the Outer Ards Peninsula SPA and the Copeland Island SPA</p> <p>ABFI (2010). Dredging for Seed Mussels within Donaghadee Sound.</p> <p>Kaiser, M., Laing, I., Utting, S. and Burnell, J. 1998 Environmental impact of bivalve mariculture. Journal of Shellfish Research. 17: 58-66</p> <p>MJ Kaiser, KR Clarke, H Hinz, MCV Austen, PJ Somerfield, I Karakakkis 2006 Global analysis of response and recovery of benthic biota to fishing Marine Ecology Progress Series 311</p> <p>Dolmer, P., Kristensen, T., Christiansen, M. L., Petersen, M. F., Kristensen, P. S. And Hoffmann, E. (2001) Short-term impact of blue mussel dredging (<i>Mytilus edulis</i> L.) on a benthic community. Hydrobiologia. 465: 115-127</p> <p>Outer Ards Seed Mussel Stock Assessment, 2016. AFBI</p> <p>Seed Mussel Surveys report for 2017. BIM</p> <p>Report Supporting Appropriate Assessment of the impact of seed mussel fishing and relaying on Castlemaine Harbour SAC and SPA. Marine Institute</p>	

PI 2.4.3	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types	
	Burial Island and the feathers video Survey. June 2016 AFBI.	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

PI 2.5.1 – Ecosystem (Outcome)

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	N
Justification		<p>The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.</p> <p>The ecosystem of the UoA' areas is well monitored and carefully studied. Mussel dredging has the potential to adversely affect marine ecosystems in a number of ways, including:</p> <ul style="list-style-type: none"> • Removal of prey – mussels are an important food item for certain species of wildlife, notably birds. • Removal of habitat – mussel beds create a habitat that is colonized by a range of other animals including both invertebrates and small fish. • Physical damage to the seabed – mussel dredges can catch boulders and cobbles from the seabed, and their removal can change its physical character. <p>Seed mussel fishing The removal of mussel seed will cause a local shift in species composition back to the state prior to the settlement of mussel spat that will have occurred a couple of month earlier. Additionally predatory species that were attracted to the location due to a surplus of potential food may dissipate again. The natural development and disappearance of seed beds tends to be a stochastic process and therefore the ecosystem i.e. predatory communities are not dependent on its existence. The changes in species interactions will not be detectable against natural variability.</p> <p>Relaying and harvesting at the cultivation site The artificial addition of mussels (secondary producers) to enclosed ecosystems may have a knock on effect on other species that rely on primary production processes for food i.e. carrying capacity of the bay. This has been measured for many of the bays.</p> <p>While no changes have been reported from cultivators with respect to mussels (i.e. stocking density, meat weight) this does not necessarily imply that other ecosystem components may not be negatively affected by the addition of mussels, in particular if cultivation sites would run under full capacity. Any change in trophic level of the ecosystem, if detectable is not on the scale of several years for recovery.</p> <p>Fishing activity concentrates in areas where mussels are of high density and quality. This limits the area of fishing to very specific locations and not widely distributed across the entire UoA fishing area. Thus, over the long term, dredging will not affect the entire area.</p> <p>The exploitation of mussels is deemed very low in comparison to the productivity of the stock. The results of the PSA analysis indicate that the mussel stock is robust. Key habitat areas (notably reefs) are protected from any dredging activity by depth restrictions, and other potentially sensitive areas are closed to dredging altogether.</p> <p>Data and simulation modeling of carrying capacity and counts of bird numbers provide evidence that the fishery is highly unlikely to cause serious or irreversible disruption to the ecosystem. The</p>		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
		<p>management and modeling of the Natura 2000 sites ensures that there is a surplus of mussels in the ecosystem in these areas to meet the energy requirements of shellfish-eating birds. There is evidence to show that there is a low risk of harm from the removal of stones using the lightweight mussel dredges, which all of the UoA vessels are required to use.</p> <p>The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm; SG60 and SG80 are met.</p> <p>While there is some evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm this is not comprehensive and not all the sites within the UoA are monitored; SG100 is not met.</p>
References	Review of the current allocation system and carrying capacity indicators for mussel ongrowing areas. BIM report 2017	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		

PI 2.5.2 – Ecosystem (Management)

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	<p>There is a partial strategy in place, if necessary.</p> <p>The main aspect of the fisheries that has the potential to alter the functioning of ecosystems is the cultivation of mussels within closed bays. There is the potential that if overstocking over the carrying capacity of the system were to occur, this might have adverse effects on other ecosystem components. The licensing scheme is a partial strategy aimed to prevent any uncontrolled extension of the fishery and thus aims to avoid the utilization of bays above the carrying capacity.</p> <p>There is less of a concern with respect to the impact on ecosystems with respect to the seed extraction. As most mussel seed beds are ephemeral habitats that will not survive winter conditions, the associated fauna, is mainly comprised of mobile predatory or scavenging species that have been attracted to the area due to the surplus of food in form of mussel seed. Due to the stochastic occurrence of mussel beds in time and space these predatory or scavenging species are not directly reliant on this food resource to maintain their local populations (i.e. the seed beds do not contribute to the establishment of mature ecological communities due to their ephemeral nature). Furthermore, past mussel seed beds have been found in depth of 20-30 metre and are thus outside the reach of most diving birds. There is a survey strategy in place in NI and IE to screen mussel beds for quality (i.e. size and age structure) that should be able to inform about the nature of the mussel seed beds once found (i.e. ephemeral bed or overwintering bed). There is explicit protection of ecosystems for Natura designations, either through a test of significance/screening and appropriate assessment if required to ensure the conservation objectives are not at risk by the fishery as is the case in NI and Cromane, or by virtue of them not being available for seed fishing until the required assessments are completed, as in the case of other Natura designated areas in IE. SG60 and SG80 are met.</p> <p>There is a partial strategy in place but this not meet the MSC definition of a strategy (as contained in the MSC CR) and does not consist of a plan; SG100 is not met.</p>		
b	Guidepost	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	<p>The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p>
	Met?	Y	Y	N

PI 2.5.2	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function
Justification	<p>The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The licensing of cultivation areas was identified as the main strategy adopted to limit cultivation areas and through this maximum stocking densities.</p> <p>The partial strategy does take into account local knowledge of historical performance and growing conditions and knowledge about the carrying capacity of bays acquired through the development of modelling techniques for carrying capacity in some bays has been acquired and no adverse effects on the ecosystem were reported in the literature.</p> <p>Research on modelling approaches for carrying capacity have been investigated both in NI and IE and may form part of the basis for management decisions if proven to be sufficiently robust for this purpose. However recent stocking densities have been less than this maximum allowable allocation and whilst originally, maximum allocations were based on historical performance and technical input, the system of allocation requires review as new information is likely available based on more recent performance that may inform the partial strategy on the likely ecosystem effects and confirm that the fishery does not pose a risk of long term irreversible harm.</p> <p>The Review of the current allocation system and carrying capacity indicators for mussel on-growing areas 2017 presents the existing data sources for assessing ecological carrying capacity in the on-growing bays. The information that has been gathered is appropriate for the management of individual cultivation sites or an overall management of those sites.</p> <p>This information was useful when investigating the Carrying Capacity of the harvesting sites and bays overall but no carrying capacity assessment was presented for any of the cultivation bays in the south of Ireland. Input limits will be calculated using available technical and industry input. As an added level of precaution, the reference formula for allocations was revised to 30t per hectare over a three year growing cycle. All bays currently under certification are subject to a range of research projects of relevance to the various elements of carrying capacity. Principal among these have been data collected in support of the Water Framework Directive (WFD), aquaculture carrying capacity models and the appropriate assessments completed in support of aquaculture licencing.</p> <p>The current allocation strategy is therefore based on a precautionary approach and the well understood relationship between the growing areas and other components of the ecosystem. The strategy has been implemented successfully for a number of years in that there is no evidence or concern that the activity poses a risk of serious or irreversible harm to ecosystem structure and function.</p> <p>Following the assessment team’s determination that there are measures in place that require monitoring and assessments of the carrying capacity and productivity of individual cultivation bays. Research is ongoing and where assessments haven’t been completed risk is mitigated by not increasing activity. Therefore, there is a partial strategy in place that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance now being achieved; SG60 and SG80 are met.</p> <p>There is no strategy (as defined in the MSC CR) that consists of a plan in place; SG100 is not met.</p>

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function																				
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.																		
	Met?	Y	Y	Y																		
	Justification	<p>The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).</p> <p>Following the arguments outlined in SIa and SIb above the strategy of licensing sites and setting a maximum amount of transferable seed is likely to work. Similarly, the strategy of conservation, through designation of environments with special features that may be sensitive is considered effective and the partial strategy in place that allows a fishery to exist in these areas should ensure the fishery does not pose a risk of serious or irreversible harm. For non-designated areas, the exploitation of ephemeral seed beds to date again, is considered likely to work and not pose a risk of serious or irreversible harm. Therefore, the partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems); SG60 and SG80 are met.</p> <p>In cases where large allocations were sought for an individual bay, decisions were taken on the maximum capacity of the bay and these were based on historical “best harvest” figures and any other technical data available at that time. The rationale for this was that if it could be demonstrated that a bay could sustainably produce a certain quantity of mussels at an acceptable meat yield then that particular loading was self-evidently below the maximum “carrying capacity” of the bay and therefore permitting stocking at such a level would not “overload” the particular water body and therefore not negatively impact on the eco-system in the bay.</p> <p>All bays currently under certification are subject to a range of research projects of relevance to the various elements of carrying capacity. Principal among these have been data collected in support of the Water Framework Directive (WFD), aquaculture carrying capacity models and the appropriate assessments completed in support of aquaculture licencing.</p> <p>The key data source in measuring carrying capacity is reliable data on the cultured stock. Data is collected by a number of agencies for various statutory and licensing purposes; see Table 22 below for data collection procedures. The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved. Therefore SG 100 is met.</p> <p>Table 22. Data sources</p> <table border="1"> <thead> <tr> <th>Jurisdiction</th> <th>Data Type</th> <th>Data source</th> </tr> </thead> <tbody> <tr> <td>NI</td> <td>Seed fishery data in NI</td> <td>DAERA monitor all seed fishing activities in NI and record volumes prior to vessels leaving fishing grounds</td> </tr> <tr> <td>NI</td> <td>Seed fishery data in NI</td> <td>DAERA collect log sheets and spat sheets from all vessels fishing in NI this includes source and relay information</td> </tr> <tr> <td>IE</td> <td>Seed Fishery in IE</td> <td>BIM collect SMS data from vessels prior to the vessel leaving the fishing grounds – this includes source and relay information</td> </tr> <tr> <td>IE</td> <td>Seed fishery data in IE</td> <td>SFPA collect log sheets and spat sheets from IE registered vessels - this includes source and relay data</td> </tr> <tr> <td>NI</td> <td>Relayed seed from NI</td> <td>DAERA relayed Section 13 permit – permission to relay, inspections of the movements to confirm stated tonnage</td> </tr> </tbody> </table>			Jurisdiction	Data Type	Data source	NI	Seed fishery data in NI	DAERA monitor all seed fishing activities in NI and record volumes prior to vessels leaving fishing grounds	NI	Seed fishery data in NI	DAERA collect log sheets and spat sheets from all vessels fishing in NI this includes source and relay information	IE	Seed Fishery in IE	BIM collect SMS data from vessels prior to the vessel leaving the fishing grounds – this includes source and relay information	IE	Seed fishery data in IE	SFPA collect log sheets and spat sheets from IE registered vessels - this includes source and relay data	NI	Relayed seed from NI	DAERA relayed Section 13 permit – permission to relay, inspections of the movements to confirm stated tonnage
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PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
		NI	Seed imports	Tracked through TRACES health certification system which is issued in the country of origin , inspections also take place
		IE	Seed imports	Tracked through TRACES health certification system which is issued in the country of origin
		NI	Full grown product	TRACES Health Certs issued by DAERA. All movements (half or full grown) also have to be accompanied by Shellfish gatherers documents, this is generally monitored by the local EHO/Council/FSA
		IE	Full grown product	SFPA - Gatherers documents
		NI	Annual production	DAERA – Documentary Interview and site inspection in addition to annual production statistic returns for EU
		IE	Annual production	BIM – Annual returns data for submission to the EU
d	Guidepost			There is some evidence that the measures comprising the partial strategy are being implemented successfully.
	Met?		Y	Y
	Justification	<p>There is evidence that the measures are being implemented successfully.</p> <p>There is evidence that the measures comprising the partial strategy are being implemented successfully.</p> <p>Yes, the licensing scheme for the cultivation sites has been fully implemented and can be seen as a success as there has been no further extension of the cultivation areas in the absence of a full review of the seed resource and its fate. Licences can be revoked under circumstances specified in the licence agreement. The management measures comprising the partial strategy are in place and implemented for seed fisheries.</p> <p>Site allocations are approved by the Minister in IE and by DAERA in NI in line with an agreed common allocation policy. Operators have been allowed in recent years to seek a review of their situation. These anomalous allocation reviews are conducted by application to the relevant Department, assessment of the case by a sub-committee of the BGMCF, and in IE consideration of recommendations by the relevant Minister. As an added level of precaution, the reference formula for allocations was revised to 30t per hectare over a three year growing cycle.</p> <p>There is evidence that the measures are being implemented successfully; SG80 is met.</p> <p>There is also evidence of appropriate data collection and research into the monitoring and assessment of the carrying capacity and productivity of individual cultivation bays. Research is ongoing and where assessments haven't been completed risk is mitigated by not increasing activity. Therefore, there is evidence that the measures are being implemented successfully; SG100 is met.</p>		
	References	<p>Review of the current allocation system and carrying capacity indicators for mussel ongrowing areas 2017. BIM</p> <p>Lough Swilly Appropriate Assessment</p> <p>Castlemaine Appropriate Assessment Conclusion statement</p>		

PI 2.5.2	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function	
	<p>Draft Fisheries Natura Plan - Seed Mussel Amended</p> <p>Draft Fisheries Natura Plan – Castlemaine</p> <p>Fisheries Natura Declaration No. 1 of 2017 Appropriate Assessment Conclusion Statement by Licensing Authority for aquaculture activities in Galway Bay Complex Special Area of Conservation (SAC)(000268). Inner Galway Bay Special Protection Area (SPA))(4031) (Natura 2000 sites)</p> <p>Report supporting Appropriate Assessment of the impact of seed mussel fishing and relaying on Castlemaine Harbour SAC and SPA</p> <p>Regulation 6(1) Determination, Fisheries Natura Plan for Mussel Seed Fishing in Castlemaine Harbour 2016-2023</p> <p>NPWS (2012) Conservation Objectives: Wexford Harbour and Slob SPA 004076. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p> <p>Aquaculture in Wexford Harbour. BIM</p>	
OVERALL PERFORMANCE INDICATOR SCORE:	90	
CONDITION NUMBER (if relevant):		

PI 2.5.3 – Ecosystem (Information)

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	<p>Information is adequate to broadly understand the key elements of the ecosystem.</p> <p>The mechanisms of potential impacts of the fishery on other ecosystem components are broadly understood. Information available on ecosystem components and carrying capacity is adequate and has shown to be sufficient to undertake research into the development of modelling approaches to carrying capacity of cultivation areas both in NI and IE. Therefore, information is adequate to broadly understand the key elements of the ecosystem; SG60 and SG80 are met.</p>		
b	Guidepost	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	<p>Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.</p> <p>The main impact of the fishery has been investigated in detail through scientific literature reviews and modelling approaches as outlined above (see 80a). Therefore SG60 and SG80 are met.</p> <p>Historical review of evidence of site specific productivity which reflects the ecosystem elements within these bays and modelling studies on carrying capacities of cultivation bays have been undertaken both in NI and IE and while not all bays have been investigated to the same extent, it can be said that the main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated, therefore SG100 is met.</p>		
c	Guidepost		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	Y
	Justification	<p>The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.</p> <p>The functions of all relevant ecosystem components are well understood and have been summarised in various reports about this fishery. Therefore SG 80 is met.</p> <p>During autumn/winter 2016 and 2017 a bycatch monitoring programme led by BIM resulted in samples being taken from the main seed and harvest areas. Results support the assertion that the fishery has negligible impacts on non-target species populations, the bycatch program should be monitored annually following the same methodology as in 2016. By-catch monitoring continued in 2017 and the Bycatch plan will be followed over the years to obtain more quantitative data and historical series that allow a complete analysis of the bycatch in the fishery.</p>		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
		Assessment of the fishery against protected habitats and species in the Irish Sea is ongoing through the appropriate assessments and where risks cannot be discounted closed areas will be proposed. Therefore, the impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood and SG 100 is met.	
d	Guidepost	Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?	Y	Y
	Justification	<p>Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p> <p>The functions of all relevant ecosystem components are well understood and the information available is sufficient to scale the impact of the fishery on these components and the wider ecosystem (see 80a-c); SG 80 is met.</p> <p>Investigations have been carried out in the form of Bycatch sampling, Appropriate Assessments and carrying capacity of bays in order to understand the impact of the fishery. Therefore, sufficient information is now available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred; SG100 is met.</p>	
e	Guidepost	Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?	Y	N
	Justification	<p>Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>The Review of the current allocation system and carrying capacity indicators for mussel ongrowing areas 2017 presents the existing data sources for assessing ecological carrying capacity in the ongrowing bays. The information that has been gathered is appropriate for the management of individual cultivation sites or an overall management of those sites.</p> <p>Documentary evidence must be proportionate to the level of risk associated with fishery. Historical experience of the fishery has shown that over the years the fishery has been productive and areas continue to be productive in recent years. Scientific opinion is taken into account and there is a close relation between science and fishery management, there are measures in place based on scientific data such as: water quality, density, mapping of productive areas, detection of non-productive areas by controlling of seed stocking density, seed bed surveys and agreements to determinate the open/closed seasons. By comparison with similar fisheries it can be confirmed that data collection is commensurate with the level of risk to the ecosystem posed by the fisheries. In light of the information gathered at the 4th surveillance audit, the assessment team can confirm that there is adequate knowledge of the impacts of the fishery on the ecosystem. Therefore SG 80 is met.</p>	

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem While there have been historical review of evidence of site specific productivity which reflects the ecosystem elements within these bays and modelling studies on carrying capacities of cultivation bays have been undertaken both in NI and IE not all bays have been investigated to the same extent. In addition, the impacts of this fishery on target, Bycatch and ETP species are not precisely understood. While there is general knowledge about these components the impact on these by the fishery has not been investigated and thus there is little to no information on functional changes that might have occurred due to the fishery. Until all appropriate assessments are complete it cannot be said that information is sufficient to support the development of strategies to manage ecosystem impacts; SG 100 is not met.	
References	Review of the current allocation system and carrying capacity indicators for mussel ongrowing areas 2017. BIM Lough Swilly Appropriate Assessment Castlemaine Appropriate Assessment Conclusion statement Draft Fisheries Natura Plan - Seed Mussel Amended Draft Fisheries Natura Plan – Castlemaine Fisheries Natura Declaration No. 1 of 2017 Appropriate Assessment Conclusion Statement by Licensing Authority for aquaculture activities in Galway Bay Complex Special Area of Conservation (SAC) (000268). Inner Galway Bay Special Protection Area (SPA)(4031) (Natura 2000 sites) Report supporting Appropriate Assessment of the impact of seed mussel fishing and relaying on Castlemaine Harbour SAC and SPA Regulation 6(1) Determination, Fisheries Natura Plan for Mussel Seed Fishing in Castlemaine Harbour 2016-2023 NPWS (2012) Conservation Objectives: Wexford Harbour and Slobs SPA 004076. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Aquaculture in Wexford Harbour. BIM	
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		

PI 2.6.1 – Translocation (Outcome)

PI 2.6.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The 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, or non-native species into the surrounding ecosystem.	There is evidence that the translocation activity is highly unlikely to introduce diseases, pests, or non-native species into the surrounding ecosystem
	Met?	Y	Y	N
	Justification	<p>The translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.</p> <p>Translocation of mussel seed within Irish waters from fished seed beds to cultivation sites is highly unlikely to introduce pests, disease or pathogens or non-native species other than those that might already be present within the ecosystem. The translocation of any mussel biomass within the UoC does require official authorisation by the respective regulatory body with the appropriate legal control measures. Similarly for the import and export of any mussel seed from outside the UoC authorisation is required and mussels will be inspected following national and international regulations and personal communication with respective governmental agency. With respect to mussels the potential transfer of the non-native slipper limpet is one major concern. Based on the existing control measure it is highly unlikely that the activities of the fishery will introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem.</p> <p>The non-native mussel <i>M. galloprovincialis</i> is already present within the UoC ecosystem but is currently restricted to the western seaboard of Ireland. Identification of the presence of <i>M. galloprovincialis</i> is difficult because it is impossible to distinguish between <i>M. edulis</i> and <i>M. galloprovincialis</i> except by genetic marker. BIM has recently commissioned a genetic analysis of mussel samples from various sites around Ireland (Terence O’Carroll, BIM, pers. comm.) which showed significant presence of <i>M. galloprovincialis</i> and hybrid <i>M. edulis</i> / <i>M. galloprovincialis</i>. For west coast sites, overall 58% of samples were <i>M. edulis</i>, 14% were <i>M. galloprovincialis</i> and 29% were hybrids. However, no presence of <i>M. galloprovincialis</i> was found off Cromane and Wicklow or in Lough Foyle. Within the main seed mussel harvesting and relaying sites on the east coast, there appears to be no threat at present of extending the distribution of <i>M. galloprovincialis</i> and its hybrid with <i>M. edulis</i>. The aspect of translocation of this species was dealt with in under P1.1.4.</p> <p>The translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem; SG60 and SG80 are met.</p> <p>There is no direct scientific evidence that would support the claim that through the translocation process it is highly unlikely to introduce diseases, pests, pathogens or non-native species into the surrounding ecosystem. Therefore, there is no evidence that the translocation activity is highly unlikely to introduce diseases, pests, pathogens, or non-native species into the surrounding ecosystem; SG100 is not met.</p>		
	References	Translocation order IE Translocation order NI The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd.		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

PI 2.6.2 – Translocation (Management)

PI 2.6.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place 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?		Y	Y	Y
Justification		<p>There is a strategy in place for managing the impacts of translocation on the surrounding ecosystem.</p> <p>There is a strategy in place that enables the monitoring and management of all mussel movements within the UoC and from outside areas. The translocation of any mussel biomass within the UoC does require official authorisation for disease control by the respective regulatory body with the appropriate legal control measures (i.e. spot check examination of mussel seed and adult mussels). Similarly for the import and export of any mussel seed from outside the UoC authorisation is required and mussels will be inspected following national and international regulations and personal communication with the respective governmental agency. Legislation is designed to control movements for allocative purposes but also informally forms part of the National Strategic Plan for the Sustainable Development of Irish Aquaculture and Northern Ireland strategy for the avoidance of introduction of invasive species.</p> <p>Invasive Species Ireland (http://invasivespeciesireland.com/background/) previously acted as a co-ordination mechanism and provides advice and resources for stakeholders, in addition to carrying out risk assessment, policy development, education and awareness, activities, research and development of invasive alien species action plans. However this project did not receive round 2 funding, so BIM have initiated a number of programmes to ensure that the risks continue to be addressed.</p> <p>The National Strategic Plan for the Sustainable Development of Irish Aquaculture identifies Invasive Alien Species as a key issue for the Aquaculture Sector in Ireland. To implement the strategy BIM has been working with aquaculture operators to carry out risk assessments and develop biosecurity plans. However a key challenge for the process is identifying what action should be taken by whom in the event that an invasive alien species is found by an aquaculture operator or at an aquaculture facility. To ensure the effectiveness of Biosecurity Plans it is important that aquaculture operators understand and trust the process and the consequences in the event that an invasive species is confirmed. To date risk assessments and draft biosecurity plans have been developed by a number of aquaculture businesses. Operators have committed to adopting best practice to maximise the opportunity to identify any alien species that may be present and to minimise the risk of spread linked with daily operations e.g. with stock movements.</p> <p>BIM have a seat on the UK/Ireland marine pathways IAS group. In summer of 2016 a two day training workshop was provided by BIM and GiMarIS, to the bottom grown mussel operators to improve understanding of the risks of IAS, and assist with species description and identification. BIM have formed a working group with key stakeholders to address the challenges of Alien Species and the Aquaculture Sector. Further BIM have initiated a screening procedure for IAS species on the seed beds in the Irish sea where risks are identified prior to movement of stocks. Advice and information is disseminated to industry members via the CLAMS Groups. Where issues/risks are identified local stakeholder groups may be convened e.g. Loughs Agency, MI, BIM, Aquaculture Initiative.</p>		

PI 2.6.2	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function			
	<p>The identification of <i>Crepidula</i> in Belfast Lough has been subject to on-going controls on the prevention of spread of this invasive species from aquaculture including mussel cultivation. Several reports investigating the causes of introduction and current spread of the organism have been undertaken.</p> <p>There is extensive published information and studies on the impacts of IAS species, transport pathways and species associated with shellfish movements. Other control measures include;</p> <ul style="list-style-type: none"> • Wildlife Acts in NI and IE prohibit the transportation of alien species • The seed beds are monitored for the presence of alien species. (AFBI – NI, BIM and external consultants in IE) • Industry members have been trained in the identification of IAS species • NI officers check individual loads and source areas for the presence of alien species. • BIM manage the pre-screening of seed beds in the Irish Sea. Work areas are evolving and IAS species research associated with mussel movements is in the 2017 work programme and the draft 2018 work programme <p>There is a strategy in place for managing the impacts of translocation on the surrounding ecosystem; SG60, SG80 and SG100 are met.</p>			
b	Guidepost	<p>The measures are considered likely to work based on plausible argument (e.g. general experience, theory, or comparison with similar fisheries/species).</p>	<p>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.</p>	<p>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.</p>
	Met?	<p>Y</p>	<p>Y</p>	<p>N</p>
	Justification	<p>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.</p> <p>The translocation of mussel within the UoC requires special authorisation and spot check assessment by the local authorities. Any imported mussel from outside the UoC would be inspected for diseases, pests, pathogens, or non-native species thus to avoid their introduction into the surrounding ecosystem. These legal measures demonstrate that a risk based assessment has been conducted and that these risks are being actively managed; SG60 and SG80 are met.</p> <p>There are several reports and Aquaculture Codes of Practice developed through industry/agency activities and some independent peer-review assessment (on-going) for particular cases involving the translocation of mussel seed. Invasive Species Ireland has also undertaken risk assessments which include aquaculture activities. However, there is no peer-reviewed scientific assessment that confirms that there is no risk with a high degree of certainty to the surrounding ecosystem associated with the translocation activity, although these reports do outline the current risks and support the mitigation strategies that appear to be effective where incidences have occurred associated with the mussel fisheries. SG100 is not met.</p>		

PI 2.6.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function	
c	Guidepost	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?	Y	N
	Justification	<p>Contingency measures have been agreed in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation.</p> <p>Legislation provides for the limitation of spread of introduced disease, pathogens and pests/non-native species) (invasive species). Specific legislation is required before introductions take place (Movement Orders) and where high risk organisms are identified (emanating from European legislation and implemented in NI and IE) they appear adequate to prevent the accidental further spread of the risk organism. The example of Crepidula identification in Belfast Lough and the resulting restrictions on movement of stock out of the Lough to other areas is an example of the measures that can be taken. Invasive species Ireland supports the scientific evaluation and risk assessment in association with the various agencies in NI and IE. BGMCF March 2012 minutes provides a reference to this effect. SG 80 is met.</p> <p>There is no specific formal mussel fishery contingency plan documented and available in the case of an accidental introduction of diseases, pests, pathogens, or non-native species due to the translocation. SG100 is not met.</p>	
References		<p>Translocation order IE Translocation order NI The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd. Ageing slipper limpet (Crepidula fornicata) shells from Belfast Lough Quercus Project QU09-16 The slipper limpet Crepidula fornicata Linnaeus, 1758 becomes established in Ireland (Gavin McNeill, Julia Nunn and Dan Minchin) Marine Aquaculture Code of Practice (Draft), Invasive Species Ireland Draft Minutes BGMCF - Meeting 11 (published) Irelands National Biodiversity Plan 2011-2016</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			NA

PI 2.6.3 – Translocation (Information)

PI 2.6.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is 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?	Y	Y	N
	Justification	<p>Information is sufficient to adequately inform the risk and impact assessments required in the SG80 Translocation management level of performance (PI 2.6.2).</p> <p>Information is sufficient to adequately inform the risk and impact assessments required in the SG80 Translocation management level of performance (PI 2.6.2) as evident from published reports (Rising tide report, Stokes et al 2004) and information publically available on the internet http://invasivespeciesireland.com/; http://www.marlin.ac.uk/marine Aliens/. SG60 and SG80 are met.</p> <p>Monitoring of translocations is governed by legislation and can be seen as comprehensive and there has been specific evaluation of risks for a number of bays, notably within Natura designations. However, it is uncertain whether the information derived from these activities can demonstrate that there is no impact from introduced diseases, pests, and non-native species with a high degree of certainty for all translocations to all bays; SG100 is not met.</p>		
References		<p>The Rising Tide: The review of the Bottom Growth Mussel Sector on the Island of Ireland, 230 pp. Inshore Ireland Publishing Ltd.</p> <p>Stokes, K., O'Neill, K. & McDonald, R.(2004) Invasive species in Ireland on behalf of Quercus</p> <p>http://invasivespeciesireland.com</p> <p>http://www.marlin.ac.uk/marine Aliens/</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				

8.1.1.3. Principle 3 – Effective Management – Evaluation Tables
PI 3.1.1 – Legal & customary framework

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> ▪ Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and ▪ Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and ▪ Incorporates an appropriate dispute resolution framework. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.</p> <p>The European Common Fisheries Policy (CFP) is an overarching and comprehensive legal, control and management framework for the management of European Fisheries. The main aims of the CFP are the sustainable exploitation of European fish stocks. The EU has partnership agreements with non-EU countries to manage straddling stocks and the exploitation of non-EU stocks by EU fishing vessels. The CFP was reviewed under the Irish presidency of the EU Council and the new CFP (EU 1380/2013) came into effect on 1/1/2014.</p> <p>The CFP is translated into National Law by the competent authorities in each member state (MS). In the Republic of Ireland (IE) this is the Department of Agriculture, Food and the Marine (DAFM). In Northern Ireland (NI) this is the Department of Agriculture, Environment and Rural Affairs (DAERA previously DARDNI). In the IE the fishery is managed under the Fisheries Amendment Act 2003, the Sea Fisheries and Maritime Jurisdiction Act 2006 and the Foyle and Carlingford Fisheries Act 2007. In NI the legal framework for management is based on the Fisheries Act (Northern Ireland) 1966 and Sea Fisheries Acts 1967 and 1968 as well as the Foyle and Carlingford Fisheries Order 2007. In Northern Ireland the Crown Estate controls the seabed and aquaculture licenses (Fish Culture Licenses) are issued through DAERA.</p> <p>This fishery is managed by the 2 competent authorities. Vessels are granted permits to fish for seed mussel in the Irish Sea and Northern Irish Waters. Licences are issued for the on-growing sites and for relaying seed onto these sites. Seed mussel fishing is permitted for a specific season. The season is opened and closed by the competent authority in Northern Ireland and by the minister in the IE. An allocation of seed is provided for each license holder related to the area of the license held. The seed fishery is opened on the advice of scientific agencies in order to ensure that the seed is strong enough to survive the fishery and relaying. The effective management of the resource is evident from annual legislation governing the opening and closing of the seed beds for fishing and the annual allocation of the seed resource. There is evidence of an effective national legal system and <u>organised and effective cooperation</u> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2, therefore SG60 and SG80 are met.</p>		

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> ▪ Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and ▪ Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and ▪ Incorporates an appropriate dispute resolution framework. 			
	<p>A high court action taken by industry members found that there was an agreement in place, “the Voisinage agreement” which did not have sufficient basis in law. This reciprocal agreement allowed Irish and Northern Irish boats to fish within the 0-6 mile territorial waters of each jurisdiction. This finding has impacted Northern Irish boats by preventing them from fishing in the waters of the IE as traditionally they have done. DAFM have drawn up legislation which would strengthen this arrangement and provide a legal framework for this agreement but it has not been passed into law. This bill was proposed by government but has not passed all stages of the approval process and is at committee stage in the Seanad (Feb 2018).</p> <p>Britain has declared that it will be exiting the European Union (Brexit) including the Common Fisheries Policy (CFP). When this occurs all UK sovereign waters will return to UK control. It is unclear whether there will continue to be cooperation between Northern Ireland and the IE over fisheries matters. It is unclear if the Voisinage agreement will continue to be honoured. At this time, given such uncertainties it can be concluded that binding procedures governing cooperation with other parties have not been fully established and therefore SG 100 is not met.</p>			
b	Guidepost	<p>The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.</p>	<p>The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.</p>	<p>The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.</p>
	Met?	Y	Y	Y
	Justification	<p>The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.</p> <p>All parties involved in the fishery, including industry representatives, have access to the management system of this fishery through their interaction with the Bottom Grown Mussel Consultative Forum (BGMCF). This forum has an advisory role to the minister and competent authority. Through this forum disputes can be discussed and in some cases resolved.</p> <p>In all cases in the application of the fisheries laws in relation to this fishery all parties have access to the judicial system of the respective state which is available to resolve legal disputes which cannot be resolved through the customary mechanisms within the management system.</p> <p>IE: There is a mechanism for the resolution of legal disputes within the Aquaculture licensing system. When an on-growing site is applied for the application is forwarded to a list of statutory consultees who make observations on the suitability of the application. The appellant has the right to view and comment on these observations. The decision to grant or refuse an application can be appealed to the Aquaculture License Appeals Board (ALAB) for review. Any conditions placed by the minister on the license can also be appealed. The appellant or objector can proceed to judicial review if they are not satisfied with the decision of ALAB. This access to the legal system is evidence of a mechanism for the resolution of legal disputes.</p>		

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> ▪ Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and ▪ Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and ▪ Incorporates an appropriate dispute resolution framework. 			
	<p>The allocation of seed is related to the area of seabed under licence to each producer. There is a mechanism within the management system whereby producers can request a review of their allocation. If this is not acceptable the producer would have access to the judicial system to question any decision by the minister or his agents but this has not been tested.</p> <p>In both jurisdictions there are mechanisms for the resolution of legal disputes and these are considered to be effective in dealing with most issues and are appropriate to the context of the fishery; SG60 and SG80 are met.</p> <p>Note this scoring issue refers only to legal disputes. While mechanisms to address disputes before they become legal in nature are desirable they are not always effective. The mechanisms for the resolution of disputes once they have become legal in nature, within the IE and NI management systems, are the Courts systems in the respective jurisdictions. The Courts systems in both jurisdictions are transparent and represent the appropriate forum for resolving legal disputes. While there have been a number of instances of parties seeking recourse through the Courts in recent years and while disputes that go this route can take a long time to reach a resolution, in the end the Courts are ultimately effective at resolving legal disputes; SG100 is met.</p> <p>Note. The planned exit of Britain from the European Union may complicate cross-border cooperation on fisheries management. As a result the continuing efficacy of the legal and customary framework including any changes that occur as a result of “Brexit” will be monitored at annual surveillance audits.</p>			
c	Guidepost	<p>The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p>The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>
	Met?	Y	Y	Y
	Justification	<p>The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p> <p>The EU CFP which governs the management of all European fisheries specifically states that the management of fisheries in Europe will be sustainable and will ensure that there are sufficient stocks of fish to allow future generations to fish (EU 1380/2013). The CFP shall ensure that fishing and aquaculture activities contribute to long-term environmental, economic, and social sustainability. Furthermore, the CFP should contribute to increased productivity, to a fair standard of living for the fisheries sector including small-scale fisheries.</p> <p>National legislation mirrors this commitment to environmental and social sustainability which is evident in the legislation which governs fisheries management in both jurisdictions. National policies commit the Irish and Northern Irish authorities to sustainable exploitation which ensures the social and environmental sustainability of the fishery.</p>		

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> ▪ Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and ▪ Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and ▪ Incorporates an appropriate dispute resolution framework. 	
	<p>The UKs planned exit from the EU and therefore also the CFP should not affect the overall commitment of the UK to sustainability. The UK and IE are separate signatories to the United Nations Convention on the Law of the Sea (UNCLOS) which includes commitments to the conservation of living resources (Art 61).</p> <p>The fishery is managed under national and international laws which include commitments to sustainable exploitation and social responsibility. This formal commitment to the legal rights of people dependent on fishing for food and livelihood is consistent with the objectives of MSC Principles 1 and 2 and therefore SG60, SG80 and SG100 are met.</p>	
References	<p>International UNCLOS Common Fisheries Policy EU 1380/2013 London Fisheries Convention 1964</p> <p>IE Fisheries Amendment Act 2003 Sea Fisheries and Maritime Jurisdiction Act 2006 Foyle and Carlingford Fisheries Act 2007 Review of the Aquaculture Licensing System – May 2017</p> <p>NI Fisheries Act (Northern Ireland) 1966 Sea Fisheries Acts 1967 and 1968 Foyle and Carlingford Fisheries Order 2007</p> <p>BGMCF minutes</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		95
CONDITION NUMBER (if relevant):		

PI 3.1.2 – Consultation, roles & 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	Guidepost	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
Met?		Y	Y	Y
Justification		<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.</p> <p>The fishery is managed, in both jurisdictions by a number of departments and agencies. These various agencies cooperate and interact to ensure that the fishery is managed to reach its objectives and that this is achieved without undue negative impact on the environment or on other users of the resource.</p> <p>IE:</p> <p>In the Republic of Ireland the competent authority is the Department of Agriculture, Fisheries and the Marine. Their function and role is defined and includes managing access to the seed fishery (licensing, seed allocation) and to the growing bays (Aquaculture and foreshore licenses). Aquaculture license decisions can be appealed to the Aquaculture Licensing Appeals Board (ALAB).</p> <p>An Bord Iascaigh Mhara (BIM) provide survey data and scientific support to the Dept. BIM also act as the Secretariat for the BGMCF which includes industry representation.</p> <p>The Marine Institute are the scientific advisors to the Minister in regard to fisheries and aquaculture. They have a role in scientific research to support the Appropriate Assessment of aquaculture in the growing bays and protected areas in the open sea, thus ensuring that seed fishing, relaying and on-growing mussels is not adversely impacting the environment. The MI also support the development of Fishery Natura Plans (FNP) which are the documented management plans for fishing within or adjacent to Special Areas of Conservation (SAC) and Special Protection Areas (SPA).</p> <p>National Parks and Wildlife Service (NPWS) have a role in managing the SACs and SPAs in order to ensure that the designated Conservation Objectives are met. They liaise with the MI and the Dept. and they approve FNPs for fisheries which may impact on these SACs/SPAs.</p> <p>Bottom Grown Mussel Consultative Forum: is the forum which includes all stakeholders in the fishery and which advise the Depts. and the Ministers in both jurisdictions. While it is only advisory the industry does have an input into the management of the fishery.</p> <p>Sea Fisheries Protection Authority (SFPA) is the agency responsible for the control and enforcement of fisheries in the IE. All fishing activities are open to inspection by SFPA fisheries officers. All vessels involved in the fishery are monitored on the Vessel Management System (VMS) which ensures they do not fish in closed areas. The SFPA are advised by the Sea Fisheries Protection Consultative Committee (SFPACC).</p>		

PI 3.1.2	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>			
		<p>Food Safety Authority of Ireland have a role in ensuring that producers are providing safe food to the market place. They have no role in the seed fishery but have a role in biotoxin monitoring and Microbiological classification of shellfish growing beds.</p> <p>Irish Farmers Association Aquaculture Sections (IFA- Aquaculture) is the national industry representative body which acts and advises on behalf of shellfish farmers.</p> <p>Northern Ireland organisations and their role: DAERA: In NI the competent authority for the management of fisheries and aquaculture is the Department of Agriculture, Environment and Rural Affairs (DAERA previously DARDNI). Its role is similar to that of the DAFM in the republic in that it is responsible for the legal framework which manages the fishery. DAERA issues permits and aquaculture licenses.</p> <p>Agri Food and Biosciences: (AFBI) acts as scientific advisor to DAERA. AFBI provides survey data and scientific assessment of the state of the seed stock and the expected volume of seed accessible each year.</p> <p>Food Standards Agency: has a role which is similar to the FSAI in IE. They are responsible for biotoxin testing and microbiological classification of shellfish growing beds.</p> <p>The Loughs Agency is a cross border agency which has a role in managing and developing the marine resources in Carlingford Lough and Lough Foyle.</p> <p>The Cross Border Aquaculture Initiative EEIG (CBAIT-EEIG) is a cross border agency which aims to develop aquaculture in Northern Ireland and the 6 border counties of the IE. EEIG provides secretariat functions for the BGMCF.</p> <p>Sea Fisheries Inspectorate NI is a section of DAERA and its role is to conserve, protect, inspect and monitor sea fisheries in Northern Ireland.</p> <p>Anglo Northern Ireland Fish Producers - ANIFPO is the industry representative body in Northern Ireland representing commercial fishers.</p> <p>There are numerous and varied government departments, agencies and organisations which have a role in the management system. These have all been identified and their functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. Therefore SG 100 is met.</p>		
b	Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	Y

PI 3.1.2	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
	Justification	<p>The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.</p> <p>At an EU level the reform of the CFP involved consultation with all stakeholders including the industry, the public and members of environmental NGOs. All national policies which influence fisheries management and conservation are subject to Strategic Environmental Assessment (SEA) which details the potential environmental impact of the policy. Public comments are invited from all interested parties during this process.</p> <p>In the IE the aquaculture licensing process involves consultation with 10 government agencies and the public. All comments and stakeholder submissions must be legally taken into account. There is an independent appeals process, including an oral hearing element if requested, which allows all views to be expressed in a transparent manner.</p> <p>All fisheries or aquaculture operations within Natura 2000 sites (SACs and SPAs) must produce a Fishery Natura Plan which is publically available and comments from all interested parties are accepted.</p> <p>The BGMCF have regular meetings, the minutes of which are available to the public. From the minutes it is evident that the industry are consulted on issues which effect the fishery and that their views are sought and regularly communicated back to the relevant authority. The industry has an influence on the decision making processes which governs the fishery. Any interested party can request to attend the meetings and environmental NGOs have been invited to attend and discuss issues of concern.</p> <p>There are various fora which are open to public consultation on all aspects of the management of the fishery. Therefore it is concluded that the management system includes consultation processes that regularly seek and accept relevant information and demonstrates consideration of the information and explains how it is used or not used. Therefore SG 100 is met.</p>	
c	Guidepost	<p>The consultation process provides opportunity for all interested and affected parties to be involved.</p>	<p>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</p>
	Met?	<p>Y</p>	<p>Y</p>
	Justification	<p>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</p> <p>At an EU level the CFP reform sought and accepted consultation from all interested parties. All parties were invited to comment on the reform proposals. At a National level seafood development policies are open for public consultations (e.g. EMFF operational programme, Food Harvest 2020, Going for Growth - a strategic action plan in support of the NI Agri-food industry) and are subject to SEA, during which the views of the public and all interested parties are sought.</p> <p>Specifically during the process for licensing aquaculture sites there is the opportunity for a range of government agencies to comment on applications and once a decision is made observations are invited from all stakeholders. Encouragement takes the form of a request for comment and an explanation that interested parties can influence the decisions on the policy.</p>	

PI 3.1.2	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>	
	<p>It is concluded that the consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</p> <p>Therefore SG 100 is met.</p>	
References	<p>Departments and agencies:</p> <p>IE:</p> <p>DAFM (https://www.agriculture.gov.ie/)</p> <p>ALAB (http://www.alab.ie/)</p> <p>BIM (www.BIM.ie)</p> <p>Aquaculture Initiative (CBAIT EEIG) (www.aquacultureinitiative.eu)</p> <p>Marine Institute (www.marine.ie)</p> <p>NPWS (www.NPWS.ie)</p> <p>BGMCF (www.aquacultureinitiative.eu)</p> <p>SFPA (www.sfpa.ie)</p> <p>FSAI (www.fsai.ie)</p> <p>IFA – Aquaculture (https://www.ifa.ie/sectors/aquaculture/)</p> <p>www.Fishingnet.ie Portal for fisheries and aquaculture</p> <p>NI:</p> <p>DAERA (www.daera-ni.gov.uk)</p> <p>AFBI (www.afbini.gov.uk)</p> <p>FSA (www.food.gov.uk/northern-ireland)</p> <p>Loughs Agency (http://www.loughs-agency.org/)</p> <p>ANIFPO (www.seasource.com/)</p> <p>Publications:</p> <p>Food Harvest 2020 (www.agriculture.gov.ie/foodwise2025/foodharvest2020/)</p> <p>Foodwise 2025 (https://www.agriculture.gov.ie/foodwise2025/)</p> <p>National Strategic Plan for Sustainable Aquaculture Development (www.agriculture.ie)</p> <p>NI:</p> <p>UK Multi-Annual National Plan for Aquaculture – DEFRA</p> <p>Going for Growth – A strategic action plan in support of the Northern Ireland Agri-Food Industry - Agri-Food Strategy Board 2015</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		100
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 Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	Y
	Justification	<p>Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.</p> <p>The Republic of Ireland and Northern Ireland authorities are subject to laws and policies which commit them to the conservation and sustainable management of fisheries under their jurisdiction. The EU CFP and UNCLOS are the main overarching legal frameworks which govern these objectives. The CFP explicitly adopted the precautionary approach in its objectives of sustainable management.</p> <p>National Policy and long term strategies mirror the international objectives with both competent authorities committed to sustainable management of the resource. The Irish and Northern Irish legal framework (see detail under PI 3.1.1) is designed to ensure sustainable management of the resource.</p> <p>The overall goal of the seafood division of the DAFM is to implement national policies, negotiated within the Common Fisheries Policy, that support a long term sustainable seafood industry for Ireland, and to maximise the long term contribution of the seafood industry to the economies of coastal regions. DAERA-NI have committed to the sustainable development of fisheries in its waters and to the objectives of the CFP.</p> <p>Both jurisdictions are subject to the commitments and objectives of the EU Habitats and Birds directives which have been implemented to prevent deterioration or negative impact on the conservation objectives for certain protected areas (SACs and SPAs). Fishery Natura Plans are drawn up to ensure that long-term sustainable fishing practices are promoted. Careful monitoring and reassessment (every 5 years) form an essential element of this system. All appropriate assessments and FNP are published and open to consultation.</p> <p>Carrying capacity studies and reviews have been conducted for the on-growing bays in both jurisdictions. These indicate that the capacity of the bays to sustainably produce shellfish has not been exceeded.</p> <p>There is ongoing research which is investigating the long-term potential for the fishery and the implications of long-term climate change on the fishery. The findings of this research will be discussed at the BGMCF and therefore will influence the management of the fishery.</p> <p>It is concluded that clear long-term objectives, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy and that therefore SG 100 is met.</p>		
	References	International / Cross Border UNCLOS (www.un.org) Common Fisheries Policy EU 1380/2013 BGMCF minutes of meetings (www.aquacultureinitiative.eu)		

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach	
	<p>IE: Food Harvest 2020 (www.agriculture.gov.ie/foodwise2025/foodharvest2020/) Foodwise 2025 (https://www.agriculture.gov.ie/foodwise2025/) Harnessing Our Ocean Wealth (2012, www.ouroceanwealth.ie) Appropriate Assessment reports (http://www.fishingnet.ie/sea-fisheriesinnaturaareas/)</p> <p>NI: Smile project reports (http://www.loughs-agency.org/ecosystem-modelling/) Appropriate assessment Reports - www.daera-ni.gov.uk/articles/special-areas-conservation</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		

PI 3.1.4 – Incentives for sustainable fishing

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	Y
	Justification	<p>The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.</p> <p>CFP policy is to promote sustainable fisheries to ensure that future generations have access to sufficient resources. Under the CFP 2013 reform the European Maritime and Fisheries Fund (EMFF) is the funding mechanism and it supports sustainable fishing practices. There was, in the past, a modernisation programme which grant aided the purchase of boats which would be more suitable for open sea seed fishing. Under the Current Irish Operational Programme for the EMFF (2014 – 2020) there is no subsidy available for increases in fleet capacity.</p> <p>There is a limited resource of exploitable mussel seed available. The allocation is linked to the area of licensed sites. The harvesting cap was reduced as a precautionary measure to ensure that harvesting sites were not overstocked.</p> <p>Unsustainable fishing practices are prohibited and disincentives apply. The fishery is monitored and fishing in closed areas has led to enforcement orders and penalties. Penalties exist for breaches of fishing rules and regulations. There is constant monitoring of fishing effort, catch levels and by-catch to ensure effort is controlled. The seed resource is surveyed and remains closed until there is sufficient available and it is of a size which will survive transfer to growing beds.</p> <p>Continued work on appropriate assessments and the protection of ecosystems ensures that fisheries are prevented from having a negative impact. The area under aquaculture license is prohibited from expansion unless an appropriate assessment (AA) has been completed which indicates that expansion will have no negative impact on the conservation objectives of the protected area. Sensitive areas / species are protected within SACs and SPAs. New areas, which may benefit from protection, are constantly investigated. In Northern Ireland there has been a prohibition on expansion of the bottom mussel aquaculture sites since 2002 due to a perceived lack of additional seed resources to support expansion.</p> <p>It is concluded that the management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices. Therefore SG 100 is met.</p>		

PI 3.1.4	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing	
References	<p>IE: Operational Programme for the EMFF (2014 – 2020) (www.agriculture.gov.ie/emff/) www.Fishingnet.ie Portal for fisheries and aquaculture</p> <p>NI: Appropriate assessment - www.daera-ni.gov.uk/articles/special-areas-conservation</p> <p>Operational Programme for EMFF www.daera-ni.gov.uk/articles/european-maritime-fisheries-fund</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		

PI 3.2.1 – Fishery specific objectives

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
Met?		Y	Y	N
Justification		<p>Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.</p> <p>The CFP ensures that the operation and management of the fishery is guided by rules and policies to support sustainable exploitation. National policy in both jurisdictions commits to the sustainable exploitation of the mussel seed fishery and aquaculture development.</p> <p>The Rising Tide review of the bottom mussel industry on the Island of Ireland was published in 2008. Its guiding policy states "The purpose of the regulation and management regime for the seed mussel resource shall be to ensure the sustainable exploitation of the wild mussel seed resource and to maximise the benefits derived from that resource in terms of volume and value of the mussel crop subsequently grown, harvested and processed with the objective of generating sustainable economic activity and employment in coastal communities". Many of the recommendations targeting sustainability and environmental protection have been implemented.</p> <p>One of the main recommendations was that the seed allocation be linked to the operators who were most successful at on-growing the seed. There would therefore be an incentive to make the best use of the limited seed resource and those most successful would be rewarded. This recommendation has not been implemented fully. Due to the highly dynamic nature of the East coast of Ireland it has proven difficult to establish a reliable relationship between seed allocation and on-growing performance.</p> <p>It is concluded that short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system and that therefore SG60 and SG80 are met.</p> <p>The objectives of the management of this fishery are the continued sustainable exploitation of the resource. This is well defined but measurement criteria have not been fully established for all stages of the production cycle. There are short and long term objectives established within the management system but all objectives cannot be said to be well defined and measureable or demonstrably consistent with achieving MSCs P1 and P2; SG 100 is not met.</p>		
References		DAFM (https://www.agriculture.gov.ie/) DAERA (www.daera-ni.gov.uk) International UNCLOS (www.un.org) Common Fisheries Policy EU 1380/2013 The Rising Tide - A Review of the Bottom Grown (BG) Mussel Sector on the Island of Ireland, 2008(https://www.agriculture.gov.ie/)		
OVERALL PERFORMANCE INDICATOR SCORE:				80
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 under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	<p>There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>The National fisheries management systems, in both jurisdictions, are actively and demonstrably managing the seed fishery and relaying operations. Annual scientific surveys are conducted and the resulting reports are published. These result in advice to the relevant minister and competent authorities which results in the fishery opening, vessels receiving permits for fishing and seed allocations being distributed.</p> <p>The BGMCF is active and is influencing, through its advice and stakeholder input, the decision making processes. The annual survey reports are publicly available and they are presented to the members of the BGMCF. The advice from the forum feeds into the management decisions and this system is evident from the meeting minutes of the BGMCF.</p> <p>Natura Fishery Plans have been written and published for most of the fishery areas. This process has resulted in changes to the fishery where this is required to protect sensitive species and habitats from negative impact of the fishery or relay activity. Sensitive areas identified have been closed to fishing activity and closely monitored. The Appropriate Assessments have also been conducted for most areas and have resulted in changes to the fishery or aquaculture licenses if required to protect sensitive species or habitats.</p> <p>The overall objective of the management system is the continued sustainable exploitation of the fishery and the protection of the environment within which it resides. It is concluded that the management of the fishery includes established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives and therefore SG60 and SG80 are met.</p>		
b	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	N
	Justification	<p>Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>The BGMCF have regular meetings and the minutes are made publically available. It is evident from these meetings that the industry has access to the decision making authorities and can influence management decisions. Therefore serious issues which have been identified can be responded to.</p>		

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
	<p>There is evidence of responding to water quality issues in the growing beds, invasive species risks, seed resource location issues and seed survey reports. These issues have been responded to in a timely and adaptive manner.</p> <p>The seed fishery is opened and closed depending on advice from the agencies which survey the beds. Where imminent risk to the beds have been identified there is a Force Majeure clause which enables the managers to open the fishery early if there is a risk of the bed being predated upon. This is evidence of adaptable and timely management decisions being made and communicated.</p> <p>Recent court cases were discussed at the forum meetings and communications were published on these issues, which have directly affected some of those involved in the fishery and have the potential to impact on all stakeholders.</p> <p>During the process of writing and approving Fishery Natura Plans there have been issues which required decision to be made and changes implemented in the fishery. These decisions were made and the changes implemented in a timely and effective manner. Similarly, where issues of concern for habitats have arising during the process of Appropriate Assessment decisions have been taken to curtail expansion.</p> <p>It is concluded that decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions and therefore SG60 and SG80 are met.</p> <p>In order to meet the scoring guide of 100 it is required that <u>all</u> issues be responded to in a timely, transparent and adaptive manner. There is evidence that this was not the case for <u>ALL</u> issues.</p> <p>A review of the seed allocation and its relationship to successful on-growing was a recommendation of the Rising Tide report in 2008. Some progress was made in that annual reviews take place to decide whether or not allocations need to be changed. So far it has been deemed appropriate to leave the allocation system as it. Due to the highly dynamic nature of the East coast of Ireland it has proven difficult to establish a reliable relationship between seed allocation and on-growing performance</p> <p>The legal framework which supported the Voisinage agreement was not sufficiently supported in law and new legislation has been proposed by the Minister and is currently at committee stage, however there is no definite timeline for completion.</p> <p>It is concluded that decision-making processes do not respond to all issues identified in a timely manner and therefore SG 100 is not met.</p>		
c	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.
	Met?		Y
	Justification	<p>Decision-making processes use the precautionary approach and are based on best available information.</p> <p>Decision making processes relating to the fishing of seed use the precautionary approach with careful surveying of areas and ground-truth of the survey results. The quality of the seed is monitored until it is considered strong enough to survive fishing and relaying. This is evidence of</p>	

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.			
	<p>a precautionary exploitation of the resource. A minimum resource level is required before fishing will be allowed.</p> <p>There are annual reviews of the allocation system and individual reallocations have been completed. The precautionary approach was utilised when addressing the stocking cap on harvesting sites. The cap was reduced for all sites equally rather than linking the success of growout to the seed allocation as identified in the Rising Tide Report.</p> <p>There are carrying capacity models for all 5 of the Northern Ireland on-growing bays and these are used to calculate the maximum seed volume that can be relayed to each site, without breaching the carrying capacity of the bay. The models are kept up to date and this is evidence of the use of best available information being used in the decision making processes.</p> <p>It is concluded that decision-making processes use the precautionary approach and are based on best available information and therefore SG 80 is met.</p>			
d	Guidepost	<p>Some information on fishery performance and management action is generally available on request to stakeholders.</p>	<p>Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>	<p>Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>
	Met?	<p>Y</p>	<p>Y</p>	<p>N</p>
	Justification	<p>Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p> <p>Information of fishery performance and management actions is made available. Minutes from the BGMCF were made publically available on the Aquaculture Initiative website (www.aquacultureinitiative.eu) until 2015 but are not available on the site since then. They are available on request and have been made available to the assessment team. The minutes detail the issues discussed and often present data on the fishery performance.</p> <p>Seed survey reports are published online for both jurisdictions on the websites of BIM and AFBI.</p> <p>Appropriate Assessments and Fishery Natura Plans are published and available for comment.</p> <p>Review documents are published online and freely available (e.g. The Rising Tide Report, Marine Plan for Northern Ireland).</p> <p>Fishery performance is published as an overall figure of volume and value in BIMs Annual Aquaculture Production and Employment Survey and in Northern Ireland the annual Overview of NI Fishing Sector.</p> <p>It is concluded that information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings</p>		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
		<p>and relevant recommendations emerging from research, monitoring, evaluation and review activity and therefore SG60 and SG80 are met.</p> <p>In order to fulfil SG 100 a formal method of reporting with all interested stakeholders is required. While there are reports available they are not formally reported to all interested parties. Some reports must be requested and are not publically available.</p> <p>It is concluded that formal reporting to all interested stakeholders, on fishery performance and management actions does not currently occur and therefore SG 100 is not met.</p>		
e	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	N
	Justification	<p>The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.</p> <p>The Voisinage Agreement is a reciprocal arrangement between IE and NI whereby vessels can fish within the 0 – 6 mile limits in either jurisdiction. This has been a traditional arrangement since the London Fisheries Convention of 1964. A legal case taken by a number of members of the Irish Fishing Industry (2016) found that this arrangement did not have sufficient basis in law. As a result Northern Irish vessels cannot currently fish in Republic of Ireland waters. The legal case had no implications for Republic of Ireland vessels as they are still currently permitted to fish in Northern Ireland waters under the original arrangement. A bill to make provision in law for Northern Irish vessels to fish in Republic of Ireland waters (i.e. to give the Vosinage Agreement sufficient basis in law) has been proposed by the Minister and is currently in committee stage (Feb 2018). The management system complied in a timely fashion with the ruling that the Vosinage Agreement did not have sufficient basis in law in that NI vessels were immediately prohibited from fishing in IE waters; SG60 and SG80 are met.</p> <p>In order to reach the SG 100 criteria the management system must act proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges. In the past there have been legal challenges to seed allocations which have been resolved through court proceedings as well as the aforementioned challenge to the legality of the Voisinage Agreement. Judicial decisions are implemented rapidly but based on evidence submitted it has been difficult to establish if the management system is acting proactively to avoid legal disputes; SG 100 is not met.</p>		
	References	<p>DAFM (https://www.agriculture.gov.ie/) DAERA (www.daera-ni.gov.uk)</p> <p>The Rising Tide - A Review of the Bottom Grown (BG) Mussel Sector on the Island of Ireland, 2008 (https://www.agriculture.gov.ie) Marine Plan for Northern Ireland, Stakeholder Newsletter, Feb 2017</p> <p>BGMCF (www.aquacultureinitiative.eu)</p> <p>Seed Survey reports NI - AFBI (www.afbini.gov.uk)</p>		

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.	
	<p>Seed Survey reports IE – BIM (www.bim.ie) Smile project reports (http://www.loughs-agency.org/ecosystem-modelling/)</p> <p>Appropriate Assessment and Fishery Natura Plans www.Fishingnet.ie Portal for fisheries and aquaculture www.daera-ni.gov.uk/articles/special-areas-conservation</p> <p>BIMs Annual Aquaculture Production and Employment Survey (www.bim.ie) Northern Ireland the annual Overview of NI Fishing Sector. (www.daera-ni.gov.uk)</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		

PI 3.2.3 – Compliance & enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
	Justification	<p>A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.</p> <p>The SFPA and the Sea Fisheries Inspectorate NI monitor the seed fishery. All vessels which target mussel seed are fitted with Blackbox Vessel Monitoring Systems (VMS) which ensure that vessels are fishing in permitted areas and at permitted times. Daily logbooks must be kept and are inspected and analysed by the SFPA and DAERA. Daily SMS texts detailing catch statistics are collected by DAERA and BIM. Subsequent to the fishery these are then matched and compared to the official log book details for each boat.</p> <p>The SFPA fishery officers have the right to board vessels during the fishery and also on landing. In NI Sea Fisheries Inspectorate officers board and inspect each vessel every day during the fishery and also carry out catch analysis. Ongrowing bays and harvesting sites are subject to inspection and survey by the relevant authorities. Harvesting logbooks are kept and inspected by the relevant authorities.</p> <p>Both the SFPA and the Sea Fisheries Inspectorate NI have been adequately resourced and these resources target the fishery appropriately.</p> <p>It is concluded that a comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules and therefore SG60, SG80 and SG100 are met.</p>		
b	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	Y
	Justification	<p>Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.</p> <p>The sanctions available to the enforcement authorities (SFPA and Sea fisheries Inspectorate NI) are laid out in the relevant legislation.</p> <p>Recent regulation from the EU (1224/2009) instigated a new set of sanctions in the form of a penalty points system for serious fisheries offences. EU countries must include in their legislation effective, proportionate and dissuasive sanctions for serious fisheries offences. Ultimately a license suspension could be imposed once a vessel received a set number of points.</p>		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
		<p>In the IE the SI which transposed the penalty points system into national legislation (SI 125 2014) was found to be invalid by the Supreme Court on 12th December 2017. Legislation to implement the EU regulations must therefore be redrafted. This does not however impact the existing legislation governing fisheries offences.</p> <p>There have been few issues with non-compliance in the Irish Sea fishery in recent years. The SFPA report that there are sometimes minor issues of delay with logbooks but these would not be considered offences. Recent reported issues with fishing in restricted areas in Northern Ireland during the seed fishery 2017 resulted in a sanction (prohibition of fishing for 1 day) and these have been consistently applied and have provided effective deterrence.</p> <p>It is concluded that sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence and therefore SG60, SG80 and SG100 are met.</p>		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	Y
	Justification	<p>There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.</p> <p>The enforcement agencies in NI and the IE reported no issues of serious non-compliance in recent years. The surveillance and monitoring of the fishery is considered to be sufficiently rigorous to suggest that non-compliances would be identified. Surveillance of vessels using remote VMS (Vessel Monitoring System) ensures constant electronic vigilance. Inspection of vessels during the fishery, on landing and catch sampling have raised no issues of concern over recent years. The seed fishery is conducted over a short period, in a limited geographical area and is considered to be monitored effectively. On-growing sites are available for inspection and are visited by agency staff regularly for microbiological and biotoxin sample collection.</p> <p>The vessels complete application forms each year prior to the fishery. During the fishery daily updates of catch volume, fishing area and relaying area are provided to the authorities. Subsequent to the fishery logbooks are returned to the authorities for inspection and analysis. Catch sampling for by-catch and invasive species is carried out by the vessels themselves and reported back to the relevant authorities.</p> <p>It is concluded that there is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery and therefore SG60, SG80 and SG100 are met.</p>		
d	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	<p>There is no evidence of systematic non-compliance.</p> <p>Enforcement agencies who monitor the fishery rigorously report no evidence of systematic non-compliance. The seed fishery is conducted over a short period, in a limited geographical area and is considered to be monitored effectively. On-growing sites are available for inspection and are</p>		

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
	visited by agency staff regularly for microbiological and biotoxin sample collection. There is no evidence of systematic non-compliance and therefore SG 80 is met.	
References	<p>Common Fisheries Policy EU 1380/2013 SI 125 2014</p> <p>Sea Fisheries Protection Authority (www.sfpa.ie) Sea Fisheries Inspectorate NI (www.daera-ni.gov.uk/topics/fisheries)</p> <p>FSA (www.food.gov.uk/northern-ireland)</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		100
CONDITION NUMBER (if relevant):		

PI 3.2.4 – Research plan

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>There is a research plan which involves various agencies and is documented by the BGMCF.</p> <p>Research includes regular surveys, by both agencies and industry, for seed availability, stock assessment, by-catch sampling and invasive species. Carrying capacity models have been developed for all 5 of the on-growing bays in NI and these are continuously updated and run to ensure compliance with carrying capacity objectives.</p> <p>Research includes work which is undertaken to satisfy legal requirements such as Appropriate Assessment in Natura 2000 areas. Research projects have also been identified to answer longer term, strategic goals such as broad ranging hydrographic modelling of larval dispersal and the impact of climate change on aquaculture (Bluefish Project and Irish Sea Portal Pilot). The major research needs to address issues which are necessary to manage the fishery now and in the longer term are being met.</p> <p>It is concluded that there is a research plan which provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2 and therefore SG60 and SG80 are met.</p> <p>In order for the research plan to meet the criteria for SG 100 it must be comprehensive and provide a coherent and strategic approach to research across P1, P2 and P3. While there is a research plan and it provides relevant results to manage the fishery it is not considered to be comprehensive nor is it considered to have documented a long-term objective of addressing future areas of risk. Therefore it is concluded that SG 100 is not met.</p>		
b	Guidepost	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	N
	Justification	<p>Research results are disseminated to all interested parties in a timely fashion.</p> <p>Results from research which addresses legal requirements such as appropriate assessment reports are available widely and are communicated to all interested parties in a timely manner. Survey reports on the seed availability are provided online by BIM and AFBI. Modelling reports on carrying capacity and reports from longer term studies such as Bluefish and the Irish Sea Portal will be made available through dedicated websites.</p>		

PI 3.2.4	The fishery has a research plan that addresses the information needs of management	
		<p>It is concluded that research results are disseminated to all interested parties in a timely fashion and therefore SG60 and SG80 are met.</p> <p>Results from research which address issues specific to the fishery or specific to certain aspects of the fishery are often not widely available and often not widely published. Examples of this would be by-catch data and invasive species data. These are made available on request but are not disseminated to all interested parties in a timely fashion and are not widely and publicly available, therefore SG 100 is not met.</p>
References	<p>BGMCF (www.aquacultureinitiative.eu)</p> <p>Seed Survey reports NI - AFBI (www.afbini.gov.uk)</p> <p>Seed Survey reports IE – BIM (www.bim.ie)</p> <p>Smile project reports (http://www.loughs-agency.org/ecosystem-modelling/)</p> <p>Appropriate Assessment and Fishery Natura Plans www.Fishingnet.ie Portal for fisheries and aquaculture www.daera-ni.gov.uk/articles/special-areas-conservation</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		

PI 3.2.5 – Management performance evaluation

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	N
	Justification	<p>The fishery has in place mechanisms to evaluate key parts of the management system.</p> <p>The extensive seed surveys carried out by the industry and support agencies evaluate the seed resource prior to the fishing season and from this information the BGMCF formulate advice to DAERA and the IE Ministers on the opening of the fishery and the expected stock available. This advice is formulated annually and the fishery output volumes (from daily stock tracking data and logbooks) can be evaluated against the forecast volumes. The seed fishery is monitored throughout the open period and the timing of closure depends on the review of the results of this monitoring.</p> <p>There is ongoing monitoring of the environmental impact of the industry on the environment. The Appropriate Assessment for Wexford Harbour is the only outstanding report and this should be completed soon. There are no indications of serious environmental degradation and this delay should not hinder the operation of current producers. Expansion is halted until the final reports are available to the competent authorities.</p> <p>The BGMCF is the forum where the issues which impact on the fishery and which demand management decisions are discussed. This forum is well represented and open to discussions with the NGOs and other stakeholders who may have misgivings concerning the environmental impact of the seed fishery.</p> <p>These ongoing, connected and cooperative management processes are evidence of mechanisms that evaluate key parts (resource availability, environmental impacts, management decisions etc.) of the management system; SG60 and SG80 are met.</p> <p>While mechanisms that review most parts of the management system are in place they are disparate in nature and many occur for reasons other than the seed fishery (e.g. Natura process, SAC/SPA designation etc.). Therefore there is no process that evaluates all parts of the management system in a cohesive manner; SG 100 is not met.</p>		
b	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	N
	Justification	<p>The fishery-specific management system is subject to regular internal and occasional external review.</p> <p>The management system is regularly reviewed internally as Ministers make decisions on opening and closing the fishery and decide on new harvest site licenses. The fishery is also reviewed at BGMCF meetings where interested parties can raise any issues of concern they may have.</p> <p>The CFP is occasionally reformed which involves a full review of all member states management systems and also involves a major consultation with all interested parties.</p>		

PI 3.2.5	<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives</p> <p>There is effective and timely review of the fishery-specific management system</p>	
	<p>The fishery-specific management system is also subject to occasional external review with the last such review being the Rising Tide report (2008).</p> <p>It is concluded that the fishery-specific management system is subject to regular internal and occasional external review and therefore SG60 and SG80 are met.</p> <p>The last full external review of the fishery was the Rising Tide in 2008 which represented a comprehensive review of the entire industry and regulation mechanism by external experts; however, the process has not been repeated since. Therefore the fishery-specific management system is not subject to regular external review; SG 100 is not met.</p>	
References	<p>DAFM (https://www.agriculture.gov.ie/) DAERA (www.daera-ni.gov.uk)</p> <p>The Rising Tide - A Review of the Bottom Grown (BG) Mussel Sector on the Island of Ireland, 2008 (https://www.agriculture.gov.ie) Marine Plan for Northern Ireland, Stakeholder Newsletter, Feb 2017</p> <p>BGMCF (www.aquacultureinitiative.eu)</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		

8.1.2. Appendix 1.2 Risk Based Framework (RBF) Outputs

8.1.2.1. Appendix 1.2.1 – Principle 1 SICA and PSA Scoring and Rationales

The target species (mussels) was identified as data-deficient under PI 1.1.1. The Default Assessment approach could not be used as there is no stock assessment of and no biological reference points for the management of mussels.

Therefore the RBF was use to evaluate the impact of the Ireland Bottom Grown Mussel Fishery on mussel stock(s) in the study area.

Note as this is a MSC CR v1.3 assessment this RBF analysis is conducted according to the process outlined in Annex CC of MSC CR v1.3. For Assessments conducted according to MSC CR v1.3, the RBF for PI 1.1.1 is a two stage process. Initially a Scale Intensity Consequence Analysis (SICA) is conducted followed by a Productivity Susceptibility Analysis (PSA). The result of both steps is therefore outlined in Table 23 and Table 24 below.

The potential consequence categories and associated scores are presented with the eventual outcome score recommended by stakeholders outline in **RED**.

Table 23. Principle 1 – SICA Scoring for PI 1.1.1 Stock Status

Performance Indicator	Risk-causing activities	Spatial scale of activity	Temporal scale of activity	Intensity of activity	Relevant subcomponents	Consequence score	MSC Score
PRINCIPLE ONE: Target species outcome	<ul style="list-style-type: none"> ▪ Direct capture 	1	3	3	Population size	1	100
					Reproductive capacity		
					Age/size/sex structure		
					Age/size/sex structure		
Rationale for selecting worst plausible case scenario	<p>The initial step of a SICA involves the determination of the “worst plausible case” combination of fishing activity and scoring element.</p> <ul style="list-style-type: none"> • There is only one scoring element (i.e. mussels) <p>The assessment team in conjunction with stakeholders identified the direct capture of seed mussels as the activity with the greatest potential to cause risk to the mussel stock. Participating stakeholders agreed that:</p> <ul style="list-style-type: none"> ▪ Gear loss is very unlikely to occur in the seed harvesting process and that consequently there would be no unobserved mortality beyond some level of mortality on seed mussels that might be impacted but not ultimately captured by mussel dredges. ▪ There is negligible bycatch of mussels in other fisheries. ▪ Whilst significant surveying for seed mussel beds occurs each year, acoustic survey methods are used, and if any small samples of mussels are taken in order to confirm the results of the acoustic surveys, the mussels are not landed, but returned to the sea bed. <p>No other risk-causing activities were identified by the workshop participants, consequently:</p> <ul style="list-style-type: none"> • Direct mortality (i.e. capture) as a result of fishing was identified as the most important risk causing activity <p>Therefore, the worst possible case scenario for scoring under SICA is the impact of direct removals of seed mussels, due to fishing, on mussel stocks.</p>						
Rationale for Spatial scale of activity	<p>The spatial scale of activity in this instance was defined as the percentage of the total range of the stock that overlaps with all fishing activity affecting the stock. Fishing activity on wild mussel stocks is confined almost exclusively to the harvesting of seed mussel for re-laying, so the spatial scale of activity was interpreted as the area encompassed by seed mussel harvesting as a percentage of the total area of the mussel stock.</p> <p>While it is unclear as to the true extent and structure of mussel populations around the island of Ireland, there is currently no evidence of separate <i>M. edulis</i> stocks in the area. Therefore mussels in the area are considered part of wider mussel stocks around the island of Ireland. In this case the extent of the mussel stock is assumed to be the area of the UoA. In total the UoA encompasses approx. 46,200 km² around the island of Ireland, with approx. 41,000km² being within the territorial waters of the Republic of Ireland and 5,200 km² within the territorial waters of Northern Ireland. Note that, at least within the Irish Sea, the mussel stock is thought to extend well outside the UoA so this figure of 46,200 km² likely represents an underestimate.</p> <p>The total area encompassed by seed mussel harvesting in each year can be estimated using mandatory VMS and black box systems. While it varies between years with the initial assessment estimating it to be approx. 150 km² and 3 km² on average in Ireland and Northern Ireland are respectively (SAIG, 2013). In any case the area impacted is likely <200 km² in all years.</p>						

	<p>Table CC8: SICA spatial scale score table.</p> <table border="1"> <thead> <tr> <th>< 1%</th> <th>1 – 15%</th> <th>16 – 30%</th> <th>31 – 45%</th> <th>46 – 60%</th> <th>> 60%</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </tbody> </table> <p>Following discussions, stakeholders reached a consensus that that the area of seed mussel harvesting off the Irish coast covers only a very small percentage of the stock distribution and that a score of 1 (i.e. a spatial overlap of between <1%) should be assigned for the degree of spatial overlap between the mussel stock and the fishing activities of the bottom grown mussel fleet. The Assessment Team sees no reason to make any alterations to this score.</p> <p>In response to comments raised by Peer Reviewer B, the Assessment Team has further considered the impact that including Welsh mussels and the Welsh seed mussel fishery in this analysis would have on the outcome of this analysis. Seed mussel fishing does occurs in Wales with the fishery operating in a very similar manner to the fishery under assessment here (see the MSC assessment of the North Menai Strait mussel fishery: https://fisheries.msc.org/en/fisheries/north-menai-strait-mussel/@assessments for further details). Furthermore given the lack of evidence of different <i>M. edulis</i> stocks within the Irish Sea, and considering water movements, larval duration etc., it is likely that those mussels fished in Wales and those fished by the Irish/Northern Irish bottom mussel fishery are part of the same pan-Irish Sea mussel stock.</p> <p>If one were to expand the spatial scale of the stock under consideration here and include those mussels fished in Wales, this would lead to a corresponding increase in the spatial scale of seed fishing activity. In any case, given the scale of the fishery Vs the spatial extent of the stock under consideration, including both mussels and fishing from Wales would not lead to any substantive changes to the score here (i.e. the likely area impacted/the total area of the mussel stock is still highly likely to be less than 1%).</p>	< 1%	1 – 15%	16 – 30%	31 – 45%	46 – 60%	> 60%	1	2	3	4	5	6
< 1%	1 – 15%	16 – 30%	31 – 45%	46 – 60%	> 60%								
1	2	3	4	5	6								
Rationale for Temporal scale of activity	<p>Table CC9: SICA temporal scale score table.</p> <table border="1"> <thead> <tr> <th>1 day every 10 years or so</th> <th>1 day every few years</th> <th>1 – 100 days per year</th> <th>100 – 200 days per year</th> <th>200 – 300 days per year</th> <th>300 – 365 days per year</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </tbody> </table> <p>The seed mussel fishery is restricted to defined periods in spring (in some years only) and autumn. While the timing and duration of openings may vary between years seed mussel harvesting is restricted to less than 100 days in all years. Therefore, a temporal scale score of 3 was considered appropriate by stakeholders. The Assessment Team sees no reason to make any alterations to this score.</p>	1 day every 10 years or so	1 day every few years	1 – 100 days per year	100 – 200 days per year	200 – 300 days per year	300 – 365 days per year	1	2	3	4	5	6
1 day every 10 years or so	1 day every few years	1 – 100 days per year	100 – 200 days per year	200 – 300 days per year	300 – 365 days per year								
1	2	3	4	5	6								
Rationale for Intensity of activity	<p>Table CC10: SICA intensity score table.</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Score</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Negligible</td> <td>1</td> <td>remote likelihood of detection of activity at any spatial or temporal scale</td> </tr> <tr> <td>Minor</td> <td>2</td> <td>activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare</td> </tr> <tr> <td>Moderate</td> <td>3</td> <td>moderate detection of activity at broader spatial scale, or obvious but local detection</td> </tr> </tbody> </table>	Level	Score	Description	Negligible	1	remote likelihood of detection of activity at any spatial or temporal scale	Minor	2	activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare	Moderate	3	moderate detection of activity at broader spatial scale, or obvious but local detection
Level	Score	Description											
Negligible	1	remote likelihood of detection of activity at any spatial or temporal scale											
Minor	2	activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare											
Moderate	3	moderate detection of activity at broader spatial scale, or obvious but local detection											

	<table border="1"> <tr> <td>Major</td> <td>4</td> <td>detectable evidence of activity occurs reasonably often at broad spatial scale</td> </tr> <tr> <td>Severe</td> <td>5</td> <td>easily detectable localised evidence of activity or widespread and frequent evidence of activity</td> </tr> <tr> <td>Catastrophic</td> <td>6</td> <td>local to regional evidence of activity or continual and widespread evidence</td> </tr> </table>	Major	4	detectable evidence of activity occurs reasonably often at broad spatial scale	Severe	5	easily detectable localised evidence of activity or widespread and frequent evidence of activity	Catastrophic	6	local to regional evidence of activity or continual and widespread evidence														
Major	4	detectable evidence of activity occurs reasonably often at broad spatial scale																						
Severe	5	easily detectable localised evidence of activity or widespread and frequent evidence of activity																						
Catastrophic	6	local to regional evidence of activity or continual and widespread evidence																						
Rationale for choosing most vulnerable sub-component	<p>For the seed beds in both Irish and Northern Irish waters, harvesting is closely monitored through spat mussel log books, EU log books and “black boxes” and VMS aboard all licensed vessels. As discussed previously the seed mussel fishery is temporally and spatially restricted such that any impacts are likely to occur rarely or in few locations such that evidence of activity even at these scales is rare (implying an intensity score of 2) or, given the known impacts of dredging, to be obviously detectable at local scales (implying an intensity score of 3).</p> <p>Stakeholders reached a consensus that the appropriate intensity score for the fishery was likely to be either a 2 or a 3 (activity occurs in a few restricted locations (score 2), and there is obvious but local detection (score 3)). The Assessment Team decided to take the more precautionary of these 2 scores and has therefore assigned an intensity score of 3 to this fishery.</p> <p>Table CC11: SICA Consequence Table for Principle 1, Target Species, and Principle 2, Retained Species and Bycatch Species.</p> <table border="1"> <thead> <tr> <th rowspan="2">Subcomponent</th> <th colspan="3">Consequence Category</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>Population size</td> <td>Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.</td> <td>Full exploitation rate but long-term recruitment dynamics not adversely damaged.</td> </tr> <tr> <td>Reproductive capacity</td> <td>No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in reproductive capacity but minimal impact on population dynamics.</td> <td>Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.</td> </tr> <tr> <td>Age/size/sex structure</td> <td>No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in age/size/sex structure but minimal impact on population dynamics.</td> <td>Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.</td> </tr> <tr> <td>Geographic range</td> <td>No detectable change in geographic range. Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in geographic range but minimal impact on population range and none on dynamics.</td> <td>Clear change in geographic range due to fishing activities.</td> </tr> </tbody> </table>	Subcomponent	Consequence Category			1	2	3	Population size	Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.	Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.	Full exploitation rate but long-term recruitment dynamics not adversely damaged.	Reproductive capacity	No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.	Possible detectable change in reproductive capacity but minimal impact on population dynamics.	Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.	Age/size/sex structure	No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.	Possible detectable change in age/size/sex structure but minimal impact on population dynamics.	Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.	Geographic range	No detectable change in geographic range. Unlikely to be detectable against background variability for this population.	Possible detectable change in geographic range but minimal impact on population range and none on dynamics.	Clear change in geographic range due to fishing activities.
Subcomponent	Consequence Category																							
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Reproductive capacity	No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.	Possible detectable change in reproductive capacity but minimal impact on population dynamics.	Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.																					
Age/size/sex structure	No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.	Possible detectable change in age/size/sex structure but minimal impact on population dynamics.	Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.																					
Geographic range	No detectable change in geographic range. Unlikely to be detectable against background variability for this population.	Possible detectable change in geographic range but minimal impact on population range and none on dynamics.	Clear change in geographic range due to fishing activities.																					

	<p>Following discussion at the workshop, stakeholders agreed that the most important sub-component to consider was ‘Population size’. The ‘geographic range’ will not be affected by this activity, and whilst the ‘reproductive capacity’ and ‘age/size structure’ could potentially be affected by seed mussel harvesting, the most likely sub-component to be affected, and the one for which any impact could probably be most easily measured is “population size”. Therefore, the most vulnerable subcomponent of the scoring element (i.e. the mussel stock) was identified by stakeholders to be Population Size.</p>										
Rationale for Consequence score	<p>Following the identification of population size as the most vulnerable subcomponent of the mussel stock the stakeholders moved on to score the consequence of the activity (i.e. the bottom grown mussel fishery) on the population size of the mussel stock. Note only changes due to the fishing activities of the bottom grown mussel fleet were considered here in line with MSC CR v1.3 CC2.3.5.1g.</p> <p>The score is based on information provided by all stakeholders and the expert judgment of the assessment team, and draws qualitatively from the scale and intensity scores awarded in the preceding steps of the SICA.</p> <p>In terms of evaluating the consequence of seed mussel harvesting for future recruitment to the mussel stock, the assessment team defined ‘recruitment’ as recruitment to the reproductively-active component of the adult stock, and not settlement of spat on the seed mussel beds. There are two reasons for defining recruitment in this way:</p> <ol style="list-style-type: none"> 1. The seed beds are ephemeral in nature. Any seed mussel which is not harvested from these beds is highly likely to be washed away in winter storms or eaten by predators prior to its becoming reproductively active. 2. The removal of seed mussel does not represent “fishing mortality” in the conventional sense, but rather the moving of individuals from one area to another. The re-laying of seed mussel for on-growing actually has the potential to enhance rather than impinge on recruitment. <p>Given all the evidence examine, including the two key points outlined above, stakeholders were of the opinion that the activities of the bottom grown mussel fishery (through the direct removal of mussels) were likely to result in, at most insignificant changes to mussel population size and/or growth rate (r). In addition any changes are not likely to be detectable against background variability for the population. Therefore, it was considered appropriate to award a SICA consequence score of 1.</p> <p>Table CC14: SICA consequence categories and associated MSC SG scores.</p> <table border="1"> <thead> <tr> <th>Consequence Category</th> <th>MSC equivalent score</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>100</td> </tr> <tr> <td>2</td> <td>80</td> </tr> <tr> <td>3</td> <td>-</td> </tr> <tr> <td>>3</td> <td>-</td> </tr> </tbody> </table> <p>The resulting consequence score of 1 was converted to an MSC score using the scoring conversion in Table CC14. The consequence score resulted in an MSC equivalent score of 100.</p> <p>As this is an RBF for PI 1.1.1 the assessment team then moved on to conduct a Productivity Susceptibility Analysis (PSA).</p>	Consequence Category	MSC equivalent score	1	100	2	80	3	-	>3	-
Consequence Category	MSC equivalent score										
1	100										
2	80										
3	-										
>3	-										

Table 24. Principle 1 – PSA Scoring for PI 1.1.1 Stock Status

PI number	PI 1.1.1	
Productivity	Rationale	Score
Average age at maturity.	All mussels will spawn in their second year, but some 0-group mussels will spawn at a relatively low level.	1
Average maximum age	8 to 9 years	1
Fecundity	Millions of eggs per year	1
Average maximum size	Around 75 mm	1
Average size at maturity	Dependent on growth rate, so variable across habitats and densities. Around 15 to 30 mm.	1
Reproductive strategy	Broadcast spawner	1
Trophic level	Between 2 and 3, around 2.75	1
Total Productivity (Average)		1.00

Fishery	Modified Dutch Bottom Dredge	
Susceptibility	Rationale	Score
Areal Overlap	Overlap of fishing effort with distribution of the stock is likely to be <10% (considering both seed and harvesting activities).	1
Vertical Overlap	High overlap with the fishing gear – mussels live on the seabed and gear is specifically designed to target mussel habitat	3
Selectivity	Dredges are not selective – they can catch a wide range of size classes	3
Post capture mortality	In the seed portion of this fishery there is very little post-mortality as the mussels are re-laid for on-growing. In reality mussels can be kept alive all the way through the production cycle to the final consumer but the end result is that eventual mortality is always 100%.	3
Total Susceptibility (multiplicative)		1.65
References	https://www.marlin.ac.uk/species/detail/1421 (research by Dr. Harvey Tyler-Walters) presents a review of <i>Mytilus edulis</i> based on comprehensive reviews by Gosling (ed.) (1992a), Bayne, (1976b), Newell (1989), and Holt et al. (1998). - Gosling, E. M. (ed.) (1992). The mussel, <i>Mytilus</i> : ecology, physiology, genetics and culture. Amsterdam: Elsevier Science Publications. - Bayne, B. L. (1976). Marine mussels: their ecology and physiology. Cambridge: Cambridge University Press, IBP 10. - Newell, P. (1989). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North-Mid-Atlantic). Blue Mussel. [on-line] http://www.nwr.usqs.gov/wdb/pub/0169.pdf , 2001-02- 15 00:00:00 - Holt, T. J., Rees, E. I., Hawkins, S. J. & Seed, R., (1998). Biogenic reefs (Volume IX). An overview of dynamic and sensitivity characteristics for conservation management of marine SACs. Scottish Association for Marine Science (UK Marine SACs Project), 174 pp.	

The potential Productivity and Susceptibility categories and associated scores are presented with the eventual outcome score recommended by stakeholders outline in **RED** in Table 25 and Table 26 below.

Table 25. Potential Productivity categories and associated scores recommended by stakeholders.

Productivity determinant	Low productivity (high risk, score = 3)	Medium productivity (medium risk, score = 2)	High productivity (Low risk, score = 1)
Average age at maturity	>15 years	5 – 15 years	<5 years
Average maximum age	>25 years	10 – 25 years	<10 years
Fecundity	<100 eggs per year	100 – 20,000 eggs per year	>20,000 eggs per year
Average maximum size	>300 cm	100 – 300 cm	<100 cm
Average size at maturity	>200 cm	40 – 200 cm	<40 cm
Reproductive strategy	Live bearer	Demersal egg layer	Broadcast spawner
Trophic Level	>3.25	2.75 – 3.25	<2.75

Table 26. Potential Susceptibility categories and associated scores recommended by stakeholders.

Productivity determinant		Low susceptibility (Low risk, score=1)	Medium susceptibility (Medium risk, score=2)	High productivity (high risk, score=3)
Areal Overlap	Overlap of the fishing effort with a species distribution of the stock.	<10% overlap	10-30% overlap	>30% overlap
Vertical Overlap	The position of the stock/species within the water column relative to the fishing gear.	Low overlap with fishing gear	Medium overlap with fishing gear	High overlap with fishing gear
Selectivity for dredges	Selectivity is the potential of gear to capture or retain the species	Dredges made of a larger mesh size than the body size of the species in question (i.e. where the species can pass directly through).	Dredges where only large adult individuals are caught, or dredges that work only in specific habitats which are not the main habitat of the species in question.	Dredges which can operate over most of the habitat, and catch a wide range of size classes.
Post-capture mortality	The chance that, if captured, a species would be released in condition that would permit subsequent survival	Evidence of post-capture release and survival	Released alive	Retained species, or majority dead when released

Note on susceptibility scores

The CR provides guidance on how to score areal overlap, vertical overlap and post-capture mortality and selectivity for various fishing gears. However it does not provide guidance on how to score selectivity of dredge fisheries. The assessment team therefore decided to use the criteria developed by MEP (2010) to score selectivity in the seed mussel fishery for Menai Straits, UK. The criteria were based on criteria defined previously in the CR for other types of fishing gear.

Consequences of productivity and susceptibility scores:

Table 27 below presents the result of the PSA conducted to assess the impacts of the fishery on the target species (PI 1.1.1 Target species outcome). Following the table a further explanation of the calculations taking place within the table is provided for clarity.

Table 27. MSC PSA worksheet for PI 1.1.1 Target species outcome.

		Productivity Scores [1-3]							Susceptibility Scores [1-3]				1.1.1 only				PSA scores (automatic)				
		Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level (FishBase)	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	Catch (tons) (1.1.1)	Weighting (1.1.1)	Weighted Total	Weighted average	PSA Score	MSC Score	Risk Category Name
Taxa name	Bivalvia	1	1	1	1	1	1	1.00	1	3	3	3	1.65	10000	1.00	1.65	1.65	1.93	96.0	Low	>80
Family name	Mytilidae																				
Scientific name	<i>Mytilus edulis</i>																				
Common name	Blue/European mussel																				
Gear type	Dredge																				

1. Productivity:

For each component (e.g. species) the productivity attributes are scored [1, 3] (high, medium, low productivity). These attribute scores are then averaged to provide an overall productivity score in the interval [1, 3]:

$$\frac{7 \times 1}{7} = 1.0$$

2. Susceptibility

The overall susceptibility score is the product of the individual scores for each of the 4 susceptibility attributes rescaled to the range (1 – 3):

$$\frac{(1 \times 3 \times 3 \times 3) - 1}{40} + 1 = 1.65$$

3. PSA_score

The overall PSA score is calculated as the Euclidean distance from the origin of the point on the PSA graph represented by the productivity and susceptibility scores:

$$\sqrt{1.0^2 + 1.65^2} = 1.93$$

4. MSC score

The overall PSA score converts to an MSC score based on $MSC\ score = -11.965(PSA)^2 + 32.28(PSA) + 78.259$:

$$-11.965(1.93^2) + 32.28(1.93) + 78.259 = 96.0$$

The MSC score of 96 is used as the score for P1.1.1.

8.1.2.2. Appendix 1.2.2 – Principle 2 SICA and PSA Scoring and Rationales

The Default Assessment approach could not be used as there is no stock assessment of and no biological reference points for the management of bycatch species recorded in the both seed mussel fishery and in on-growing areas. Therefore, the RBF was used to evaluate the impact of the fishery on stocks of bycatch species within the UoA area. In fact two RBF analyses of bycatch species were carried out, one for activities associated with the seed mussel fishery and one for activities within the on-growing areas. Note as this is a MSC CR v1.3 assessment this RBF analysis is conducted according to the process outlined in Annex CC of MSC CR v1.3.

For Assessments conducted according to MSC CR v1.3, the RBF for PI 2.2.1 is potentially a two part process. Initially a Scale Intensity Consequence Analysis (SICA) is conducted. If the resultant SICA score is <80 a further Productivity Susceptibility Analysis (PSA) must be conducted whereas if the SICA score is ≥80 a further PSA is not required.

The result of subsequent steps is therefore outlined in Table 28 and Table 29 below. The potential consequence categories and associated scores are presented with the eventual outcome score recommended by stakeholders outlined in **RED**.

Table 28. Principle 2 – SICA Scoring Table for PI 2.2.1 Bycatch Species (Seed mussel fishing areas).

Performance Indicator	Risk-causing activities	Spatial scale of activity	Temporal scale of activity	Intensity of activity	Relevant subcomponents	Consequence score	MSC Score
PRINCIPLE TWO: Bycatch Species Outcome	<ul style="list-style-type: none"> Post-release impacts after capture and discarding 	1	3	3	Population size	1	100
					Reproductive capacity		
					Age/size/sex structure		
					Age/size/sex structure		
Species: For a full list see Table 6.							
Rationale for selecting worst plausible case scenario	Non-target species may be caught by dredging for seed mussels and it is this direct capture and potential post-release impacts that are likely to be the main impacts of the fishery. Spider crab (<i>Maja brachydactyla</i>) was the only species identified in the seed mussel areas as being a Minor Bycatch species for the purpose of this assessment with all other recorded species being present at lower levels. Therefore, the potential for post-release impacts on spider crabs was chosen as the worst plausible case scenario.						
Rationale for Spatial scale of activity	<p>The spatial scale of activity in this instance was defined as the percentage of the total range of the spider crab stock that overlaps with the fishing activity under consideration (i.e. the seed mussel fishery). Fishing activity on wild mussel stocks is confined almost exclusively to the harvesting of seed mussel for re-laying, so the spatial scale of activity was interpreted as the area encompassed by seed mussel harvesting calculated as a percentage of the total area known area occupied by spider crabs around the island of Ireland.</p> <p>The extent and structure of spider crab populations around the island of Ireland is not well studied but there is currently no evidence of separate stocks in the area. Therefore spider crabs in the areas where they interact with the fishery are considered part of wider stocks around the island of Ireland and as such their extent is assumed to mirror that of the UoA. In total the UoA encompasses approx. 46,200 km² and spider crab stocks are likely to extend well beyond 12nm from shore so this figure likely represents an underestimate.</p>						

	<p>The total area encompassed by seed mussel harvesting in each year can be estimated using mandatory VMS and black box systems. While it varies between years with the initial assessment estimating it to be approx. 150 km² and 3 km² on average in Ireland and Northern Ireland respectively (SAIG, 2013). In any case the area impacted is likely <200 km² in all years.</p> <p>Table CC8: SICA spatial scale score table.</p> <table border="1"> <tr> <td>< 1%</td> <td>1 – 15%</td> <td>16 – 30%</td> <td>31 – 45%</td> <td>46 – 60%</td> <td>> 60%</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </table> <p>Following discussions, stakeholders reached a consensus that that the area of seed mussel harvesting off the Irish coast covers only a very small percentage of the distribution of spider crab and that a score of 1 (i.e. a spatial overlap of between <1%) should be assigned for the degree of spatial overlap between the stock and the fishing activities of the bottom grown mussel fleet. The Assessment Team sees no reason to make any alterations to this score.</p>	< 1%	1 – 15%	16 – 30%	31 – 45%	46 – 60%	> 60%	1	2	3	4	5	6									
< 1%	1 – 15%	16 – 30%	31 – 45%	46 – 60%	> 60%																	
1	2	3	4	5	6																	
Rationale for Temporal scale of activity	<p>Table CC9: SICA temporal scale score table.</p> <table border="1"> <tr> <td>1 day every 10 years or so</td> <td>1 day every few years</td> <td>1 – 100 days per year</td> <td>100 – 200 days per year</td> <td>200 – 300 days per year</td> <td>300 – 365 days per year</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </table> <p>The seed mussel fishery is restricted to defined periods in spring (in some years only) and autumn. While the timing and duration of openings may vary between years seed mussel harvesting is restricted to less than 100 days in all years. Therefore, a temporal scale score of 3 was considered appropriate by stakeholders. The Assessment Team sees no reason to make any alterations to this score.</p>	1 day every 10 years or so	1 day every few years	1 – 100 days per year	100 – 200 days per year	200 – 300 days per year	300 – 365 days per year	1	2	3	4	5	6									
1 day every 10 years or so	1 day every few years	1 – 100 days per year	100 – 200 days per year	200 – 300 days per year	300 – 365 days per year																	
1	2	3	4	5	6																	
Rationale for Intensity of activity	<p>Table CC10: SICA intensity score table.</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Score</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Negligible</td> <td>1</td> <td>remote likelihood of detection of activity at any spatial or temporal scale</td> </tr> <tr> <td>Minor</td> <td>2</td> <td>activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare</td> </tr> <tr> <td>Moderate</td> <td>3</td> <td>moderate detection of activity at broader spatial scale, or obvious but local detection</td> </tr> <tr> <td>Major</td> <td>4</td> <td>detectable evidence of activity occurs reasonably often at broad spatial scale</td> </tr> <tr> <td>Severe</td> <td>5</td> <td>easily detectable localised evidence of activity or widespread and frequent evidence of activity</td> </tr> <tr> <td>Catastrophic</td> <td>6</td> <td>local to regional evidence of activity or continual and widespread evidence</td> </tr> </tbody> </table> <p>For the seed beds in both Irish and Northern Irish waters, harvesting is closely monitored through spat mussel log books, EU log books and “black boxes” and VMS aboard all licensed vessels. As discussed previously the seed mussel fishery is temporally and spatially restricted such that any impacts are likely to occur rarely or in few locations such that evidence of activity even at these scales is rare (implying an intensity score of 2) or, given the known impacts of dredging, to be obviously detectable at local scales (implying an intensity score of 3).</p>	Level	Score	Description	Negligible	1	remote likelihood of detection of activity at any spatial or temporal scale	Minor	2	activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare	Moderate	3	moderate detection of activity at broader spatial scale, or obvious but local detection	Major	4	detectable evidence of activity occurs reasonably often at broad spatial scale	Severe	5	easily detectable localised evidence of activity or widespread and frequent evidence of activity	Catastrophic	6	local to regional evidence of activity or continual and widespread evidence
Level	Score	Description																				
Negligible	1	remote likelihood of detection of activity at any spatial or temporal scale																				
Minor	2	activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare																				
Moderate	3	moderate detection of activity at broader spatial scale, or obvious but local detection																				
Major	4	detectable evidence of activity occurs reasonably often at broad spatial scale																				
Severe	5	easily detectable localised evidence of activity or widespread and frequent evidence of activity																				
Catastrophic	6	local to regional evidence of activity or continual and widespread evidence																				

	<p>Stakeholders reached a consensus that the appropriate intensity score for the fishery was likely to be either a 2 or a 3 (activity occurs in a few restricted locations (score 2), and there is obvious but local detection (score 3)). The Assessment Team decided to take the more precautionary of these 2 scores and has therefore assigned an intensity score of 3 to this fishery.</p>																								
<p>Rationale for choosing most vulnerable sub-component</p>	<p>Following discussion at the workshop, stakeholders agreed that the most important sub-component to consider was ‘Population size’. The ‘geographic range’ will not be affected by this activity, and whilst the ‘reproductive capacity’ and ‘age/size structure’ could potentially be affected by seed mussel harvesting, the most likely sub-component to be affected, and the one for which any impact could probably be most easily measured is “population size”. Therefore, the most vulnerable subcomponent of the scoring element (i.e. the spider crab stock(s)) was identified by stakeholders to be Population Size.</p>																								
<p>Rationale for Consequence score</p>	<p>Following the identification of population size as the most vulnerable subcomponent of the spider crab stock the stakeholders moved on to score the consequence of the activity (i.e. the mussel seed fishery) on the population size of spider crab. Note only changes due to the fishing activities of the bottom grown mussel fleet were considered here in line with MSC CR v1.3 CC2.3.5.1g.</p> <p>Table CC11: SICA Consequence Table for Principle 1, Target Species, and Principle 2, Retained Species and Bycatch Species.</p> <table border="1"> <thead> <tr> <th colspan="4">Consequence Category</th> </tr> <tr> <th>Subcomponent</th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>Population size</td> <td>Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.</td> <td>Full exploitation rate but long-term recruitment dynamics not adversely damaged.</td> </tr> <tr> <td>Reproductive capacity</td> <td>No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in reproductive capacity but minimal impact on population dynamics.</td> <td>Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.</td> </tr> <tr> <td>Age/size/sex structure</td> <td>No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in age/size/sex structure but minimal impact on population dynamics.</td> <td>Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.</td> </tr> <tr> <td>Geographic range</td> <td>No detectable change in geographic range. Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in geographic range but minimal impact on population range and none on dynamics.</td> <td>Clear change in geographic range due to fishing activities.</td> </tr> </tbody> </table>	Consequence Category				Subcomponent	1	2	3	Population size	Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.	Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.	Full exploitation rate but long-term recruitment dynamics not adversely damaged.	Reproductive capacity	No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.	Possible detectable change in reproductive capacity but minimal impact on population dynamics.	Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.	Age/size/sex structure	No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.	Possible detectable change in age/size/sex structure but minimal impact on population dynamics.	Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.	Geographic range	No detectable change in geographic range. Unlikely to be detectable against background variability for this population.	Possible detectable change in geographic range but minimal impact on population range and none on dynamics.	Clear change in geographic range due to fishing activities.
Consequence Category																									
Subcomponent	1	2	3																						
Population size	Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.	Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.	Full exploitation rate but long-term recruitment dynamics not adversely damaged.																						
Reproductive capacity	No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.	Possible detectable change in reproductive capacity but minimal impact on population dynamics.	Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.																						
Age/size/sex structure	No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.	Possible detectable change in age/size/sex structure but minimal impact on population dynamics.	Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.																						
Geographic range	No detectable change in geographic range. Unlikely to be detectable against background variability for this population.	Possible detectable change in geographic range but minimal impact on population range and none on dynamics.	Clear change in geographic range due to fishing activities.																						

The score is based on information provided by all stakeholders and the expert judgment of the assessment team, and draws qualitatively from the scale and intensity scores awarded in the preceding steps of the SICA.

Given all the evidence examined, stakeholders were of the opinion that the activities of the bottom grown mussel fishery were likely to result in, at most insignificant changes to spider crab population size and/or growth rate (r). In addition any changes are not likely to be detectable against background variability for the population. Therefore, it was considered appropriate to award a SICA consequence score of 1.

Table CC14: SICA consequence categories and associated MSC SG scores.

Consequence Category	MSC equivalent score
1	100
2	80
3	-
>3	-

The resulting consequence score of 1 was converted to an MSC score using the scoring conversion in Table CC14. The consequence score resulted in an MSC equivalent score of 100.

As this is an RBF for PI 2.2.1 and as the resultant SICA score is ≥ 80 a further PSA is not required.

Table 29. Principle 2 – SICA Scoring Table for PI 2.2.1 Bycatch Species (Relaying and harvesting in ongrowing areas).

Performance Indicator	Risk-causing activities	Spatial scale of activity	Temporal scale of activity	Intensity of activity	Relevant subcomponents	Consequence score	MSC Score												
PRINCIPLE TWO: Bycatch Species Outcome	<ul style="list-style-type: none"> Post-release impacts after capture and discarding 	1	3	3	Population size	1	100												
					Reproductive capacity														
					Age/size/sex structure														
					Age/size/sex structure														
Species:																			
For a full list see Table 6.																			
Rationale for selecting worst plausible case scenario	<p>Non-target species may be caught during dredging activities associated with the on-growing of re-laid seed mussels into market sized mussels. Potential post-release impacts following capture during ongrowing activities are likely to be the main impacts of this portion of the fishery. Green crab (<i>Carcinus maenas</i>) was the only species identified in the harvest areas as being a Minor Bycatch species for the purpose of this assessment with all other recorded species being present at lower levels. Therefore, the potential for post-release impacts on green crabs was chosen as the worst plausible case scenario.</p>																		
Rationale for Spatial scale of activity	<p>The spatial scale of activity in this instance was defined as the percentage of the total range of the green crab stock that overlaps with the fishing activity under consideration (i.e. the ongrowing portion of the bottom grown mussel fishery). Fishing activity on re-laid mussels is confined to within defined ongrowing areas, so the spatial scale of activity was interpreted as the area encompassed by ongrowing activities as a percentage of the total area known area occupied by green crabs around the island of Ireland.</p> <p>The extent and structure of green crab populations around the island of Ireland is not well studied but there is currently no evidence of separate stocks in the area. Therefore green crabs in the areas where they interact with the fishery are considered part of wider stocks around the island of Ireland and as such their extent is assumed to mirror that of the UoA. In total the UoA encompasses approx. 46,200 km² and green crab stocks are likely to extend well beyond 12nm from shore so this figure likely represents an underestimate. The total area encompassed by ongrowing areas is likely substantially less than 1% of the UoA in all years.</p> <p>Table CC8. SICA spatial scale score table.</p> <table border="1"> <thead> <tr> <th>< 1%</th> <th>1 – 15%</th> <th>16 – 30%</th> <th>31 – 45%</th> <th>46 – 60%</th> <th>> 60%</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </tbody> </table> <p>Following discussions, stakeholders reached a consensus that that the area of ongrowing activities off the Irish coast covers only a very small percentage of the distribution of green crabs and that a score of 1 (i.e. a spatial overlap of between <1%) should be assigned for the degree of spatial overlap between the stock and the ongrowing activities. The Assessment Team sees no reason to make any alterations to this score.</p>							< 1%	1 – 15%	16 – 30%	31 – 45%	46 – 60%	> 60%	1	2	3	4	5	6
< 1%	1 – 15%	16 – 30%	31 – 45%	46 – 60%	> 60%														
1	2	3	4	5	6														
Rationale for Temporal scale of activity	<p>Overall fishing activity over cultivation sites is very infrequent with the movement of mussels on cultivation sites normally occurring once a year. Once mussels are laid on individual cultivation sites they will not normally be moved for another 9 – 24 months; 9 months if moved between intertidal and sub-tidal for toughening and 24 months if grown sub-tidally. Therefore, activity days per bay per year are likely between 1 and 100 days. Therefore, a temporal scale score of 3 was considered appropriate by stakeholders. The Assessment Team sees no reason to make any alterations to this score.</p>																		

	<p>Table CC9: SICA temporal scale score table.</p> <table border="1"> <thead> <tr> <th>1 day every 10 years or so</th> <th>1 day every few years</th> <th>1 – 100 days per year</th> <th>100 – 200 days per year</th> <th>200 – 300 days per year</th> <th>300 – 365 days per year</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> </tbody> </table>	1 day every 10 years or so	1 day every few years	1 – 100 days per year	100 – 200 days per year	200 – 300 days per year	300 – 365 days per year	1	2	3	4	5	6									
1 day every 10 years or so	1 day every few years	1 – 100 days per year	100 – 200 days per year	200 – 300 days per year	300 – 365 days per year																	
1	2	3	4	5	6																	
Rationale for Intensity of activity	<p>Table CC10: SICA intensity score table.</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Score</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Negligible</td> <td>1</td> <td>remote likelihood of detection of activity at any spatial or temporal scale</td> </tr> <tr> <td>Minor</td> <td>2</td> <td>activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare</td> </tr> <tr> <td>Moderate</td> <td>3</td> <td>moderate detection of activity at broader spatial scale, or obvious but local detection</td> </tr> <tr> <td>Major</td> <td>4</td> <td>detectable evidence of activity occurs reasonably often at broad spatial scale</td> </tr> <tr> <td>Severe</td> <td>5</td> <td>easily detectable localised evidence of activity or widespread and frequent evidence of activity</td> </tr> <tr> <td>Catastrophic</td> <td>6</td> <td>local to regional evidence of activity or continual and widespread evidence</td> </tr> </tbody> </table> <p>Activity occurs rarely in restricted areas (implying an intensity score of 2) but is detectable at local level and moderately detectable at broader scale (implying an intensity score of 3) when considering the enclosed bays in which cultivation occurs as the reference ecosystems.</p> <p>Stakeholders reached a consensus that the appropriate intensity score for the fishery was likely to be either a 2 or a 3. The Assessment Team decided to take the more precautionary of these 2 scores and has therefore assigned an intensity score of 3 to this fishery.</p>	Level	Score	Description	Negligible	1	remote likelihood of detection of activity at any spatial or temporal scale	Minor	2	activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare	Moderate	3	moderate detection of activity at broader spatial scale, or obvious but local detection	Major	4	detectable evidence of activity occurs reasonably often at broad spatial scale	Severe	5	easily detectable localised evidence of activity or widespread and frequent evidence of activity	Catastrophic	6	local to regional evidence of activity or continual and widespread evidence
Level	Score	Description																				
Negligible	1	remote likelihood of detection of activity at any spatial or temporal scale																				
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Severe	5	easily detectable localised evidence of activity or widespread and frequent evidence of activity																				
Catastrophic	6	local to regional evidence of activity or continual and widespread evidence																				
Rationale for choosing most vulnerable sub-component	<p>Following discussion at the workshop, stakeholders agreed that the most important sub-component to consider was 'Population size'. The 'geographic range' will not be affected by this activity, and whilst the 'reproductive capacity' and 'age/size structure' could potentially be affected by seed mussel harvesting, the most likely sub-component to be affected, and the one for which any impact could probably be most easily measured is "population size". Therefore, the most vulnerable subcomponent of the scoring element (i.e. the green crab stock(s)) was identified by stakeholders to be Population Size.</p>																					
Rationale for Consequence score	<p>Following the identification of population size as the most vulnerable subcomponent of the green crab stock the stakeholders moved on to score the consequence of the activity (i.e. actives associated with the ongrowth of mussels on the bottom) on the population size of green crab. Note only changes due to the fishing activities of the bottom grown mussel fleet were considered here in line with MSC CR v1.3 CC2.3.5.1g.</p> <p>Table CC11: SICA Consequence Table for Principle 1, Target Species, and Principle 2, Retained Species and Bycatch Species.</p> <table border="1"> <thead> <tr> <th rowspan="2">Subcomponent</th> <th colspan="3">Consequence Category</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>Population size</td> <td>Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.</td> <td>Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.</td> <td>Full exploitation rate but long-term recruitment dynamics not adversely damaged.</td> </tr> </tbody> </table>	Subcomponent	Consequence Category			1	2	3	Population size	Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.	Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.	Full exploitation rate but long-term recruitment dynamics not adversely damaged.										
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Reproductive capacity	No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.	Possible detectable change in reproductive capacity but minimal impact on population dynamics.	Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.
Age/size/sex structure	No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.	Possible detectable change in age/size/sex structure but minimal impact on population dynamics.	Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.
Geographic range	No detectable change in geographic range. Unlikely to be detectable against background variability for this population.	Possible detectable change in geographic range but minimal impact on population range and none on dynamics.	Clear change in geographic range due to fishing activities.

The score is based on information provided by all stakeholders and the expert judgment of the assessment team, and draws qualitatively from the scale and intensity scores awarded in the preceding steps of the SICA.

Given all the evidence examined, stakeholders were of the opinion that the activities of the bottom grown mussel fishery were likely to result in, at most insignificant changes to green crab population size and/or growth rate (r). In addition any changes are not likely to be detectable against background variability for the population. Therefore, it was considered appropriate to award a SICA consequence score of 1.

Table CC14: SICA consequence categories and associated MSC SG scores.

Consequence Category	MSC equivalent score
1	100
2	80
3	-
>3	-

The resulting consequence score of 1 was converted to an MSC score using the scoring conversion in Table CC14. The consequence score resulted in an MSC equivalent score of 100.

As this is an RBF for PI 2.2.1 and as the resultant SICA score is ≥ 80 a further PSA is not required.

8.1.3. Appendix 1.3 Conditions

Not applicable. No conditions were assigned.

8.2. Appendix 2. Peer Review Reports

8.2.1. Peer Reviewer A

Overall Opinion: Peer Reviewer A

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Conformity Assessment Body Response
<i>Justification:</i> The assessment team has arrived at an appropriate conclusion substantially grounded in available evidence with references supporting the conclusion.		No response required.
<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	NA	Conformity Assessment Body Response
<i>Justification:</i> All PIs met at least SG80 level. No conditions were assigned. All previous eight conditions were closed before entering reassessment		No response required.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	NA	Conformity Assessment Body Response
<i>Justification:</i>		No response required.

General Comments on the Assessment Report (optional)

The team has done a thorough and commendable job, and provided two recommendations worth acting upon;

- 1) A synthesis of available evidence to support the argument that seed mussel beds exploited by the fishery are in fact ephemeral
- 2) Appropriate assessments of all on-growing areas not yet covered by such an assessment, and making reports of those assessments available as soon as possible.

No response required.

Performance Indicator Review

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	NA	NA	NA	RBF used as impact on target stock (ephemeral mussel seed beds) cannot be analytically determined. There is no formal stock assessment and no management reference points	No response required.
1.1.2	NA	NA	NA	Default score of 80 given as the RBF is used to score PI 1.1.1	No response required.
1.1.3	NA	NA	NA	No evidence of stock depletion.	No response required.
1.2.1	Yes	Yes	NA	The strategy is to manage the seed mussel fishery from seed beds that are ephemeral in nature. Conventional stock assessment with target and limit reference points is therefore not appropriate. SG100 is therefore not met. In the absence of those reference points, the harvesting strategy implicitly aims to safeguard and increase recruitment to the stock, so SG80 is met. Relevant guideposts SI a,b and c are all met at SG80 level. SI d is not met at SG100 because the harvest strategy is not periodically reviewed since the designation of resource allocations in 2005	No response required.
1.2.2	Yes	Yes	NA	SI a is met at SG80 as well defined harvest control rules are in place, and formalized in	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				2016. SI b is met at SG80 as harvest control takes key uncertainties related to temporal and spatial fluctuations in seed mussel availability into account. SI c is met at SG80 as monitoring of fishing activity is effective in controlling exploitation. The current harvest strategy does however not vary in relation to annual fluctuations in availability of seed mussels	
1.2.3	Yes	Yes	NA	SI a: Sufficient relevant information is available to support the harvest strategy, but stock and recruitment dynamics are not well understood and there is no formal programme for collection of relevant environmental information on major factors influencing mussel spat settlement. SI b: The inherent uncertainties are not incorporated in the management of the fishery SI c: There are no other significant fishery removals from the stock	No response required.
1.2.4	NA	NA	NA	Default score of 80 given as the RBF is used to score PI 1.1.1	No response required.
2.1.1	NA	NA	NA	Default score of 100 awarded according to MSC CR v1.3, CB3.2.1. There are no Main and	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				no Minor Retained species	
2.1.2	Yes	Yes	NA	There is a strategy in place that specifically targets mussels from harvestable beds within defined licensed areas, and an objective basis for confidence that the UoC does not pose a risk of serious or irreversible harm to retained species, with clear evidence that the strategy is implemented successfully	No response required.
2.1.3	Yes	Yes	NA	Accurate and verifiable information is available and sufficient to quantitatively estimate outcome with a high degree of certainty (routine inspections of mussel seed harvests confirm there are no other retained species, and harvestable mussels are documented in logbooks. Only on SI b SG100 was not met because information to quantitatively estimate outcome status of all retained species with high degree of certainty is not sufficient. The overall PI score of 95 is justified.	No response required.
2.2.1	NA	NA	NA	Default score of 100 awarded as RBF was used.	No response required.
2.2.2	Yes	Yes	NA	The UoC has no main bycatch species and	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				there is no specific strategy in place for managing and minimizing bycatch, estimated to lie below 1%, with some objective basis for confidence that the partial strategy will work (SG80)	
2.2.3	Yes	Yes	NA	Qualitative and some quantitative information, adequate to support a partial strategy to manage main bycatch species should one become necessary, are available on by-catch species at mussel seed fishing sites. Catch and bycatch are relayed over cultivation sites, and with bycatch levels below 1% not considered a major concern. A bycatch monitoring program has been newly established.	No response required.
2.3.1	Yes	Yes	NA	Based on information about the UoC and distribution and abundance of ETP species within the fishing areas, there is a high degree of certainty that effects of the UoC are within the limits of national and international requirements for protection of ETP species (ICES has not identified mussel dredging as having potential to adversely affect ETP species, and direct and indirect effects are assessed and described in supporting evidence)	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.2	Yes	Yes	NA	There is a strategy in place, with evidence of successful implementation, for managing impact on key ETP species (wading birds and waterfowl protected by Natura 2000 designation), including measures to minimise mortality, which is highly likely to achieve national and international requirements, with objective basis for confidence that the strategy will work (SG80). There is a clear framework for management of Special Area of Conservation (SAC) sites that conforms to guidepost b. Guidepost d: There is evidence from review of fishing impacts and conservation status of ETP species within the Natura 2000 sites, that the strategy is achieving its objective	No response required.
2.3.3	Yes	Yes	NA	There is sufficient information for quantitatively estimating the impact on ETP species, particularly wading birds and water fowl, but gaps in quantitative information on distribution and population trends of ETP species for some areas in relation to this fishery. The information is sufficient to determine whether the fishery may be a threat to ETP species and considered sufficient to support a full strategy, but	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				accurate and verifiable information on the magnitude and consequences for ETP species is not available for areas where assessments have not yet been completed (SG100 not met)	
2.4.1	Yes	Yes	NA	Spatial extent of the fishery is so limited that impacts are highly unlikely to inflict serious or irreversible harm to habitat structure	No response required.
2.4.2	Yes	Yes	NA	A partial strategy is in place that is expected to achieve the habitat outcome at SG 80 level, but several reports produced for this fishery recommend a systematic screening process of all seed mussel beds prior to exploitation. Measures to open and close the fishery and ensure protection vulnerable habitats have been established based on scientific advice. There is evidence that the partial strategy is being implemented successfully, but does not support high confidence that the strategy will work (SG100 not met)	No response required.
2.4.3	Yes	Yes	NA	Distribution of all main habitats is known at a relevant scale within cultivation areas. There is reliable information on the spatial extent of interaction, timing and location of	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				gear use, but physical impacts of the gear on habitat has not been fully quantified. Data are sufficient to detect any increase in risk to habitat but changes in habitat distribution over time are not explicitly measured.	
2.5.1	Yes	Yes	NA	The fishery is highly unlikely to disrupt ecosystem structure and function seriously or irreversibly. The removal of ephemeral seed mussel beds will not cause changes in species interactions detectable against natural variability. PSA analysis results indicate that the mussel stock is robust. Exploitation is very low in comparison to stock productivity. Key habitat areas and other sensitive areas are protected from dredging. As not all sites within the UoA are monitored, SG100 is not met.	No response required.
2.5.2	Yes	Yes	NA	A partial strategy aims to prevent any uncontrolled extension of the fishery and avoid utilization of bays above their carrying capacity. This is expected to restrain impacts of the fishery on the ecosystem but does not meet the MSC definition of a strategy and does not constitute a plan (SG100 not met). Measures are considered likely to work based on prior experience, plausible	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				argument and information on fishery and ecosystem, and there is evidence that measures are being implemented successfully.	
2.5.3	Yes	Yes	NA	Key elements of the ecosystem are broadly understood. Main impact of the fishery has been investigated in detail, and review of evidence allows inference of main interactions between the fishery and key ecosystem elements. The fishery is being assessed against protected habitats and species and its impacts on target, bycatch, retained and ETP species has been identified but not precisely understood. Data are being collected to detect any increase in risk level, but not yet all assessments are complete (SG100 not met)	No response required.
3.1.1	Yes	Yes	NA	There is evidence of effective national legislation and organized and effective cooperation to deliver management outcomes consistent with MSC Principles 1 and 2. It is however unclear if Northern Ireland and the Republic of Ireland will continue over cooperation over fisheries matters after Britain will exit the EU Common Fisheries Policy. Binding	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				procedures governing cooperation have not been fully established (SG100 not met). In both jurisdictions there are effective mechanisms for resolution of legal disputes appropriate to the context of the fishery (SG100 met). Commitment to environmental and social sustainability is evident in both jurisdictions	
3.1.2	Yes	Yes	NA	Functions, roles and responsibilities are explicitly defined and understood by all relevant parties. Numerous government departments, agencies and organizations have explicitly defined functions, roles and responsibilities in the management system. The management system includes public consultation fora on all aspects of management of the fishery, and facilitates effective engagement. The overall PI score of 100 is justified.	No response required.
3.1.3	Yes	Yes	NA	Long-term objectives of the management policy are explicit and consistent with MSC Principles and Criteria and the precautionary approach. SG100 is met.	No response required.
3.1.4	Yes	Yes	NA	The management system provides for incentives consistent with achieving	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				outcomes expressed by MSC Principles 1 and 2. These incentives are considered in regular reviews of management policy and procedures. SG 100 is met.	
3.2.1	Yes	Yes	NA	Short- and long term objectives consistent with achieving outcomes expressed by MSC Principles 1 and 2 are explicit within the fishery's management system (see the Rising Tide review, 2008). Measurement criteria have not been fully established for all stages of the production cycle (SG100 not met)	No response required.
3.2.2	Yes	Yes	NA	Management of the fishery includes established decision making processes that use the precautionary approach and result in measures and strategies to achieve fishery-specific objectives and respond to identified issues, but not for all issues (SG100 not met), in a transparent and timely matter, taking account of wider implications. Information on fishery performance is available on request, but there is no formal reporting on fishery performance and management to all stakeholders. It is difficult to establish if the management system acts proactively to avoid legal disputes (SG100 not met).	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.3	Yes	Yes	NA	A comprehensive MCS system is in place. Sanctions to deal with non-compliance are consistently applied and demonstrably provide effective deterrence. The degree of confidence that fishers comply with management is high, and there is no evidence of systematic non-compliance (SG100 is met)	No response required.
3.2.4	Yes	Yes	NA	There is a research plan that provides the management system with a strategic approach and reliable and timely information, but it is not considered comprehensive or to have documented a long-term objective to address future risk. Results are not widely and publicly available (SG100 not met)	No response required.
3.2.5	Yes	Yes	NA	Resource allocations are precautionary but there are separate processes to evaluate different parts of the management system. The fishery-specific management system is subject to regular internal review, but there has been no comprehensive external review since 2008 (SG100 not met)	No response required.

Any Other Comments

Comments	Conformity Assessment Body Response
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As the Northern Ireland and Ireland Bottom Grown Fisheries are inextricably linked (Principle 1 considering the fisheries as a single entity), the results were harmonized across all Principles and PIs. This peer reviewer did not discern any noteworthy differences in outcomes between the fisheries	No response required.
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For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
1.1.1	Yes	Yes	SICA scoring results and choice of most vulnerable subcomponent, as well as PSA scoring adequately support the stated outcome	No response required.
2.1.1	NA	NA	There are no Main and no Minor Retained species in this fishery	No response required.
2.2.1	Yes	Yes	The resultant consequence score was 1 (equivalent to MSC score 100) and therefore PSA is not required	No response required.
2.4.1	NA	NA	RBF was not used for this PI	No response required.
2.5.1	NA	NA	RBF was not used for this PI	No response required.

For reports assessing enhanced fisheries:

<i>Does the report clearly evaluate any additional impacts that might arise from enhancement activities?</i>	Yes	Conformity Assessment Body Response:
<p><u>Justification:</u> Modifications to the Default Tree for Enhanced Bivalve Fisheries are applicable to this fishery and were used, resulting in four additional PIs.</p> <p>PI 1.1.4 Genetic Outcome: SG100 is not met as there has been no independent peer reviewed scientific assessment that confirms with a high degree of certainty that there are no associated risks to the genetic structure of the wild population.</p> <p>Translocation: PI 2.6.1: Translocation is highly unlikely to introduce diseases, pests, pathogens or non-native species, but there is no direct evidence supporting that claim (SG100 not met).</p>		No response required.

PI 2.6.2: There is a strategy in place for monitoring and management of all mussel movements within the UoC and from outside, with appropriate legal control measures demonstrating that risks are being actively managed. There is extensive published information on the impact of IAS species, but no peer-reviewed scientific assessment confirming with a high degree of certainty that there is no risk to the surrounding ecosystem.

PI 2.6.3: Legislation provides for the limitation of spread of introductions/invasive species but there is no specific formal mussel fishery contingency plan in case of accidental introduction of diseases, pests, pathogens, or non-native species associated with translocation. Monitoring of translocations is governed by legislation and risks have been evaluated for a number of bays, but it is uncertain whether this can demonstrate with a high degree of certainty that there is no impact for all translocations (SG100 not met)

8.2.2. Peer Reviewer B

8.2.2.1. Peer Reviewer B – Submission at Peer Review Stage

Overall Opinion: Peer Reviewer B

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	No	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p>It is appreciated that this is a re-certification report and that the original assessment report contains many of the same assumptions as this report. However, there is some evidence in the assessment report which is not adequately considered; and there are also some conclusions in the report which are not adequately supported by evidence. There are also some areas where it is not clear that the MSC Certification Requirements have been followed.</p> <p>Comments on individual PIs highlight these issues, which are briefly summarised below.</p> <p>a) The main issue of concern is the approach of the assessment to the distribution of <i>Mytilus edulis</i> and the congeneric species <i>M. galloprovincialis</i>. Both of these species and their interspecific hybrid are found in the UoA area. The assessment has not dealt with this appropriately.</p> <p>b) A secondary concern is that the evidence available on the distribution of <i>Mytilus</i> species around Ireland also suggests that there may be more than one stock.</p> <p>c) There are two fishing métiers within the proposed UoA: dredging and hand raking. No assessment is carried out for the hand raking of seed mussels.</p> <p>d) Taking points (a)-(c) into account it seems very unlikely that there is just one UoA. There may be several UoAs; and there may also be an Indistinguishable or Practically Inseparable (IPI) species issue that should have been addressed.</p> <p>e) With regard to issues (a) and (b), a more precautionary approach to the assessment of genetic outcome would seem to be appropriate. There is a real risk that the fishery could affect the genetic structure of the wild population if <i>M. galloprovincialis</i> seed mussels were moved into an area where this species is not presently found. There is no evidence that anything would prevent this from happening.</p> <p>f) There is no evidence in the report to demonstrate that the harvest controls respond to the state of the stock; in fact it would seem that the seed mussel fishery is managed in order to attain a target output and that over most of the time series cited in the report the UoA fleet has been unable to catch its allocation because it exceeds the size of the resource.</p>		<p>The Assessment Team have specifically addressed areas where the Peer Reviewer felt that evidence had not been adequately considered, where conclusions were not adequately supported by evidence and where it was not clear that the MSC Certification Requirements have been followed.</p> <p>See response to General Comments below for a detailed response to this issue.</p> <p>See response to General Comments below for a detailed response to this issue.</p> <p>Hand-raking has been removed from the UoA See response to General Comments below for a detailed response to this issue.</p> <p>Having re-evaluated all the available evidence and removed hand raking as an eligible métier, the Assessment Team is confident that a single UoA is appropriate.</p> <p>Given the available information presented in 4.2.1. Population structure of mussel populations around the island of Ireland the Assessment Team is confident that the risk to the genetic structure of wild mussel stocks as a result of this fishery is minimal when considered against background levels of risk.</p> <p>The harvest controls respond to the “state” of the stock in terms of the presence/absence of seed, the viability and the level of threat posed to seed from predation rather than in the traditional target and limit reference points sense. This point ignores the fact that the seed mussel beds represent an ephemeral resource and that allocations in this instance are designed to prevent adverse ecosystem impacts rather than manage the parent stock.</p>

<p>g) Translocations of pests, pathogens and non-native species are not adequately assessed. The translocation of invasive non-native species is regarded as a major threat to native plants and animals and causes economic damage throughout Europe. The assessment report does not, however, mention the EU Invasive Alien Species Strategy, and the information presented about the distribution of key alien species is out of date and consequently inaccurate.</p> <p>h) Some of the evidence presented in the report cannot be regarded as current. For instance, the report cites with approval a new HCR that was agreed in 2016, yet the most recent information about the effectiveness of harvest control rules covers the period 2004 – 2011. This period was before the start of the previous period of certification and its relevance to the current management of the fishery under a new HCR is not explained. Elsewhere, the assessment relies on information about Invasive Alien Species on a report published in 2004 and does not consider the many reports and the EU Strategy on IAS that have been produced in the interim.</p>	<p>Further evidence on catches Vs allocations is presented in response to specific PIs below. The information to which the Peer Reviewer is referring has been updated. See responses to specific PIs below for further details on this issue.</p> <p>The latest information has been provided. In some instances older information is still relevant and as such its inclusion in this report is appropriate. Where the Peer Reviewer has raised specific concerns about information relating to particular PIs this has been addressed in the Assessment Team’s response to that PI. See responses to specific PIs below for further details.</p>	
<p>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</p>	<p>NA</p>	<p>Conformity Assessment Body Response</p>
<p><u>Justification:</u> No conditions have been raised.</p>		<p>No response required.</p>

If included:

<p>Do you think the client action plan is sufficient to close the conditions raised?</p>	<p>NA</p>	<p>Conformity Assessment Body Response</p>
<p><u>Justification:</u> No conditions have been raised: there is thus no Client Action Plan.</p>		<p>No response required.</p>

General Comments on the Assessment Report (optional)

Overall

Despite the criticisms of the report it is well presented and clearly written.

Some general comments on the report are presented below. As with the comments on PIs, these should not be regarded as a complete or comprehensive review of all aspects of the report; rather they are the key issues that have been identified within the scope and time allocated to this peer review.

Unit of Assessment / Certification

The report identifies the UoA and UoC as below:

Table 2. Proposed Unit of Certification for the Northern Ireland bottom grown mussel fishery.

<p>UoC</p>	
<p>Species</p>	<p>Blue mussel (<i>Mytilus edulis</i>)</p>
<p>Geographical Area</p>	<p>All fishing activity takes place within FAO Major Fishing Area 27 Northeast Atlantic (ICES Areas VIa, VIIa, VIIg, VIIj and VIIb) and is split between seed and harvest locations. Seed location Coastal waters of Northern Ireland and the Republic of Ireland within their respective 12 nautical mile Territorial Seas.</p>

	<p>Harvest locations Permitted harvest areas in identified bays of the Republic of Ireland and Northern Ireland coastal waters including:</p> <p>Northern Ireland Belfast Lough Lough Foyle Carlingford Lough (NI portion)</p> <p>Republic of Ireland Lough Swilly Castlemaine (Cromane) Wexford harbour Lough Foyle Carlingford Lough (IE portion)</p>
Stock	Blue mussels around the island of Ireland.
Method of capture	Modified Dutch Bottom Dredge*
Management system	<p>Northern Ireland Department of Agriculture, Environment and Rural Affairs (DAERA)</p> <p>Republic of Ireland Department of Agriculture Food and Marine (DAFM) and the Sea Fisheries Protection Agency (SFPA)</p>
Client Group	<p>The Aquaculture Initiative EEIG and Bord Iascaigh Mhara (BIM) representing all members of the bottom mussel industry on the island of Ireland.</p> <p>All members of the Bottom Grown Mussel Industry, eligible to fish in the relevant jurisdiction, will be eligible to access the certificate; however, only those entities that have contributed financially to the MSC process will be considered to be part of the client group for the purpose of Certification. The most up to date client group will be available on the MSC website and will be updated where any changes have occurred.</p>

There are two issues of concern here:-

1. **There is more than one target species** – the assessment considers only one UoC, yet the report presents information showing that there are two species of *Mytilus* and an interspecific hybrid within the UoA. These cannot readily be distinguished from one another (see scoring rationale for PI1.1.4a). Under these circumstances, the team should have:
 - a. Identified 3 separate Units of Certification (one for each species, and one for their hybrid); and/or
 - b. Assessed the fishery in accordance with MSC FCR requirements for Indistinguishable or Practically Inseparable (“IPI”) stocks.

Given the areas fished, in terms of both location and of substrate and depth range (which are known to be “*Mytilus* areas”) and the method of culture employed (which is thought, given the anecdotal information available, to favour *M. edulis*) it is likely that the bottom grown mussel fishery involves exclusively (or almost exclusively *M. edulis*). Therefore all seed mussels fished and harvested in this fishery are assumed to be *M. edulis*; for further information refer to [4.2.1. Population structure of mussel populations around the island of Ireland](#). Given the available evidence the Assessment Team is confident that a single UoC is appropriate in this instance.

In any case, the various *Mytilus* species and their hybrids ‘perform indistinguishable ecosystem roles meaning that there are no particular ecological concerns arising from changes between the various forms in a particular area.

2. **There is may be more than one stock** – genetic evidence indicates that at least in 2007 there were no *M. edulis* on the east coast of Ireland (Beaumont et al, 2007). It is incidental whether or not that is still the

case; the key issue is that the authors of that work concluded that there is little or no natural influx of mussel larvae into the Irish Sea from other areas; in other words there is evidence that this is a discrete mussel stock (a point also made in the MEC assessment for Menai Strait mussels and cited with approval in this assessment).

For the purposes of a precautionary assessment of PI 1.1.1 and also PI 1.1.4 it would be more appropriate to take account of this evidence and consider the consequences of allopatric *Mytilus* spp. stocks in the UoA.

The possible presence of a thermal front at the entrances to the Irish Sea in spring is cited as a potential reason for the absence of *M. galloprovincialis*. The Assessment did not find evidence to suggest that *M. edulis* in the Irish Sea represent a different stock to *M. edulis* around the rest of the island.

3. **There is more than one method of capture** – again, there is only one UoC, yet the table above identifies two fishing methods. The narrative text of the report indicates that there is limited hand raking in intertidal areas.

The report does not contain any assessment of the potential impact of this hand raking either on the seed mussel stock (P1), on the marine environment (P2), nor any consideration of the management strategy in place for this métier.

Hand-raking was originally included as it has occurred historically. However with no activity taking place there is insufficient evidence to assess the impacts of this gear type. Hand-raking has been removed from the UoA.

According to the MSC FCR v2.0, a CAB shall not change the UoA and UoC during an assessment unless the UoA is announced provisionally in the initial announcement and later confirmed MSC FCR v2.0 7.4.10 and 7.4.10.1); in this case the UoA was not announced as provisional.

Therefore in order to remove hand raking from the UoA, without falling foul of the MSC FCR as outlined above, a Variation Request, requesting a Variation from MSC FCR 7.4.10 in order to allow hand raking to be removed as part of the UoA, was submitted to MSC on 02nd May 2018.

The VR was accepted by MSC on 04th May 2018. Hand raking has therefore been removed from the UoA and will no longer be eligible for certification; this fact was communicated to stakeholders via email on 09th May 2018. Both the VR and MSC's response are available on the MSC website here: <https://fisheries.msc.org/en/fisheries/ireland-bottom-grown-mussel/@@view>

Depending on the outcome of consideration of these issues, there is certainly more than one UoC and possibly as many as 12 (3 species; 2 stocks; 2 métiers).

As outlined in the above responses a single UoA is appropriate in the assessment of this fishery based on: 1 species (*M. edulis*) x 1 stock (*M. edulis* around Ireland) x 1 fishing gear (modified Dutch Bottom Dredges).

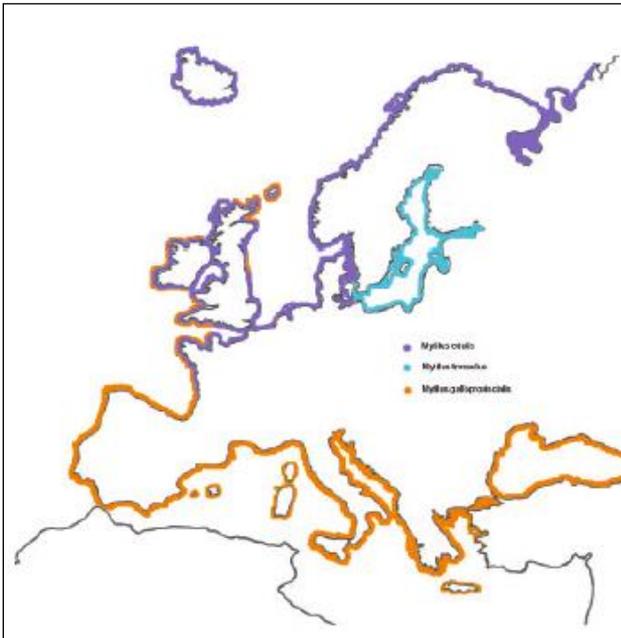
Target species: population structure

The report mentions that the taxonomic differentiation of *Mytilus edulis* and *M. galloprovincialis* is under debate. However no evidence is presented to demonstrate that most taxonomists would regard them as a single species or part of a single species complex, and until such time it would be appropriate and precautionary to regard them as separate species.

Both species of *Mytilus* and their interspecific hybrid are found on the southern, western and northern coasts of the island of Ireland. The mussels on the eastern coast of Ireland and in the Irish Sea proper are *M. edulis*

(see figure below) (Beaumont et al., 2008). This situation is described in the scoring for PI1.1.4 of the assessment report.

The re-assessment report for the Menai Strait fishery refers to more recent information about the distribution of these *Mytilus* species that is relevant to this assessment but has not been considered. That information indicates that this species distribution had been maintained until at least as recently as 2015.



The available information would seem to indicate that there is more than one *Mytilus* species in the fishery, and more than one *M. edulis* stock. This issue is not adequately addressed in the report.

The issues outlined above have been addressed in the above responses and with the addition to this report of a new section [4.2.1. Population structure of mussel populations around the island of Ireland](#). Based on the particulars of this fishery the Assessment Team is confident that, on the balance of probability, it impacts a single species *M. edulis* and a single genetic stock (*M. edulis* around the island of Ireland). Note the *M. edulis* stock featured in this report is likely genetically contiguous with *M. edulis* in the eastern Irish Sea as considered in the North Menai Strait mussel fishery (re-certified 10th May 2016); the fishery under assessment here has been awarded the same P1 outcome score as the North Menai Strait mussel fishery.

Principle 1 fishery removals: a consistent view

The report seems to be inconsistent in its approach to its assessment of fishery removals under Principle 1.

For instance, the RBF SICA and PSA analyses only consider seed mussel removals from the stock by the UoA. Elsewhere in the report it is stated that there is a single stock in the Irish Sea, but fishery removals (either of seed or adult mussels) from within the eastern Irish Sea are not taken into account in the RBF assessment.

This approach is not consistent with MSC CRv1.3 requirements for both SICA and PSA, each of which require that all fishery removals from the target species stock are considered.

[Consideration of removals of mussels in the eastern Irish Sea has been added to the SICA and PSA tables; it does not affect the outcome of either.](#)

Performance Indicator Review

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	NA	The team has used the RBF to assess this PI. Comments on the use of the RBF are presented later in this review.	No response required.
1.1.2	NA	NA	NA	This PI is not scored with the RBF is used for PI1.1.1	No response required.
1.1.3	NA	NA	NA	Scoring of this PI is not required when PI1.1.1 scores more than 80.	No response required.
1.1.4	No	No	NA	<p>The rationale here is not adequate and does not take account of all of the relevant information available.</p> <p>The rationale refers to another MSC assessment report (for the Menai Strait (MEP, 2010)). That assessment report addressed itself to the issue of whether or not there was any evidence of spatial genetic structure in the Irish Sea (as distinct from around the whole coast of Ireland).</p> <p>MEP concluded in their assessment report that there is indeed no evidence of this; the point being made in that assessment report is that only <i>M. edulis</i> is found in the Irish Sea proper; and that outside this area the genetic character of mussel stock is different (as reported in the</p>	<p>Rationale has been updated and added to to further support the Assessment Teams conclusions. In addition a new section "Population structure of mussel populations around the island of Ireland" has been added to this report.</p> <p>Given the fact that; 1) the BGM industry generally only moves seed from "edulis areas" to "edulis areas", and; 2) <i>M. galloprovincialis</i> is already naturally present around Ireland, is moved extensively by the rope mussel industry and is expected to naturally expand its range with rising water temperatures, the Assessment Team is entirely comfortable with their conclusion that, set against the background levels of "risk" to the genetic</p>

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				<p>BIM research). The different scale of the UoAs in the Menai Strait and all-Ireland assessments means that the conclusions drawn in one cannot be transposed to the other.</p> <p>Further to this, it is not at all clear why the assessment refers only to the 2010 assessment of the Menai Strait fishery and not the re-assessment that was completed in 2016 and which cites more recent evidence.</p> <p>There is good evidence in the scientific literature (Beaumont et al. 2007) that there is a genetic structure to the <i>Mytilus</i> spp. populations around the island of Ireland. Indeed the team cite evidence from BIM which shows that they are aware of this.</p> <p>The key point is that whilst <i>M. edulis</i> and <i>M. galloprovincialis</i> and their hybrid are found on the south, west and northern coasts of Ireland, only <i>M. edulis</i> is found on the Irish Sea coast of Ireland.</p> <p>No evidence is presented here that there are management measures in place that would prevent the movement of seed or adult mussels from areas where <i>M. galloprovincialis</i> is</p>	<p>structure of wild populations the fishery is highly unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.</p> <p>This report has been updated to refer to the latest re-assessment of the Welsh fishery.</p> <p>New section "Population structure of mussel populations around the island of Ireland" been added to this report.</p> <p>Agree. No response required.</p> <p>Such management measures are not necessary for the reasons outlined previously. The original score for this PI remains unchanged at 80.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>present to areas where this species is absent. Unless such evidence is presented it would seem more appropriate to award a score of no more than 60 for this PI and request the fishery to develop management measures that would support a score of 80 being awarded.</p>	
1.2.1	No	No	NA	<p>Overall MSC CRv1.3 states that for PI1.2.1, when the RBF is used to score PI1.1.1:-</p> <p>“Teams shall include in their rationale for the unmodified Annex CB PI 1.2.1 an explanation of how the harvest strategy works to achieve stock management objectives consistent with ensuring the fishery operates at a low risk as defined in the RBF.” (CC3.1.5.b)</p> <p>It is not clear from the information presented in the scoring rationale how the harvest control rules act to do this.</p>	<p>As the fishery is exploiting ephemeral seed mussel beds it is not (in it's seed stage at least) removing any mussels from the overall stock. Instead it transplanting sed from areas where natural mortality will be high (or total as implied by the ephemeral nature of the beds) to areas where natural mortality will be lower. Consequently in it's seed stage the fishery has a net positive impact on the parent stock by moving seed to areas where it can mature and reproduce several times before harvesting.</p> <p>Obviously the fishery in its harvesting phase has a net negative impact on the parent. However the balance of probability is that, over it's production cycle, the fishery likely has a net positive impact on the parent stock.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>Scoring Issue a</p> <p>The evidence presented indicates that the harvest strategy is not responsive to the state of the stock at all; nor does the argument that it <i>"implicitly aims to safeguard and increase recruitment to the stock"</i> bear scrutiny when the available scientific information on stock structure is considered.</p> <p>The scoring rationale states that:- "The key stock management objective is to provide sufficient seed mussel for re-laying on licensed cultivation sites within Ireland and Northern Ireland on a continuous basis."</p> <p>If this is the case, then it would seem that the harvest is <u>not</u> responsive to the state of the stock, and nor does it ensure that the fishery operates at a low risk level; instead its objective is stated as providing a constant output. This approach is outlined in section 4.3.2 of the report where it is stated that <i>"the annual seed allocations are based on the size of the cultivation site available for ongrowing seed mussel."</i> The allocation is based on a formula of 30t/ha and shown in Table 5 of the report.</p> <p>The key issue here should be to demonstrate</p>	<p>The issue with respect to stock structure has been dealt with previously. In addition the fishery targets ephemeral beds meaning that the harvest strategy is responsive to levels of recruitment rather than stock biomass; recruitment itself is in reality a better measure because it, due to the ephemeral nature of the beds, does not lead to areas of permanent biomass.</p> <p>The harvest strategy restricts the harvest of seed for relaying purposes to ephemeral beds and acts (through surveying and its <i>force majeure</i> provisions) to ensure the greatest possible amount of seed mussel is transplanted to areas where it can survive to become a productive component of the parent stock. In addition a fishery only takes place in an area once seed has been identified there.</p> <p>In restricting the spatial extent of the fishery and ensuring that seed is harvested when it is likely that optimal returns will be realised the harvest strategy ensures the fishery operates at a low risk as defined in the RBF (i.e. the harvest strategy maintains the level of risk</p>

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				<p>that there are adequate input controls in place (which will maintain the PSA susceptibility attributes at a constant level). This case is not adequately or clearly set out; in fact the HCR described in the report will not maintain the susceptibility of the stock to fishing.</p> <p>A fact which is ignored here but is mentioned for PI 1.2.3c is that there is very little harvesting of mature wild mussels around Ireland (though data are not presented in the report to support this claim). If this is so, then it is a very important part of the (implicit) harvest strategy, because it means that there is a largely unexploited broodstock of mussels that supports the ongoing recruitment of seed mussels.</p> <p>A score of 80 does not seem appropriate here, because the harvest strategy is not responsive to the state of the stock. It is also hard to see how a score of 60 is warranted given that the strategy does not act to maintain the susceptibility risk.</p>	<p>posed by the fishery to the parent stock at a low level).</p> <p>The fact that there is a large broodstock of mature mussels that is not impacted by the fishery is discussed throughout this report along with the the premise that the fishery temporarily boosts this broodstock through the relaying of seed.</p> <p>The harvest strategy is entirely appropriate to the specific nature of the fishery (i.e. targeting ephemeral seed beds and leaving the wider broodstock untouched). As outlined above the strategy both responds to the state of the stock and maintains the susceptibility risk.</p> <p>The Assessment Team does not see fit to make any changes to the original score for SIa; it meets SG80.</p>

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				<p>Scoring Issue b</p> <p>Again this rationale is contradictory. Sla discusses the fact that some seed mussel beds overwinter; but this SI states that they don't. Some clarification of the text is required in both instances to reconcile this.</p> <p>The rationale goes on to state that:- "Experience from all seed mussel fisheries <u>suggests</u> that harvesting occurs <u>primarily</u> in areas where the seed beds are ephemeral, and if the mussels are not harvested prior to winter storms then they will not survive over winter." [My emphasis]</p> <p>This text indicates that the evidence available to the team is not very robust (it "<i>suggests</i>"; and also that by implication some seed mussel harvesting takes place at locations where mussel beds are not ephemeral ("<i>...harvesting is primarily in areas where seed mussel beds are ephemeral...</i>").</p> <p>The rationale then states that:- The harvest strategy has not been fully tested, but annual monitoring of seed mussel beds has shown that, despite fluctuations, a significant biomass of seed mussels has persisted over</p>	<p>Slb response</p> <p>Best available knowledge suggests that some beds may overwinter in some years (e.g. if there is an absence of winter storms) but that even those that do overwinter do not persist long term. In the past managers have left seed mussels in situ to see if they could persist and while some have last over a single winter they have not been shown to persist.</p> <p>The Assessment Team did not wish to give the perception that there is no instances where mussel seed might survive overwinter. The wording of the rationale has been altered to avoid any confusion.</p> <p>The use of the word "persist" here is somewhat confusing. The Assessment Team was trying to communicate the fact that seed mussel beds continually appear in the same broad areas but not in same exact locations.</p>

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				<p>recent years in many areas, providing some evidence that the harvest strategy is achieving its objectives.</p> <p>This wording of this text is rather misleading. All of the information presented in the report indicates that seed mussels are not “<i>persistent</i>”, but are instead a recurring ephemeral resource that is found in pretty much the same location year after year.</p> <p>These comments notwithstanding, a score of 80 does seem appropriate providing that evidence can be presented to show that harvest strategy is achieving the objective of managing the susceptibility of the mussel stock to fishing impacts.</p> <p>Scoring issue c Following on from the comments above, a key element of the harvest strategy is the limited fishing pressure directed at mature mussels. Unless information is presented to describe how this is monitored, then it is not clear how SG60 is met.</p>	<p>The wording has been changed to add clarity.</p> <p>Same areas yes but same locations no. Seed mussels beds are found in the same areas but their location tends to moved around within thos areas (e.g. seed mussels are present off Wexford in most years but their precise location varies) (see Figure 2).</p> <p>Evidence to show that harvest strategy is achieving the objective of managing the susceptibility of the mussel stock to fishing impacts is discussed in response to SIa above.</p> <p>SIc response It is not monitored? The fishery only targets seed mussel beds, therefore there is no fishing pressure directed at mature mussels (beyond harvesting activity). In any case, monitoring of seed mussel activity could also be construed as monitoring of the lack fishing pressure at mature animals.</p>

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1.2.2	No	No	NA	<p>Overall MSC CRv1.3 states that for PI1.2.2, when the RBF is used to score PI1.1.1:-</p> <p>“Teams shall include in their rationale for PI 1.2.2 an explanation of how harvest control rules act to reduce the risk as defined in the RBF, as unacceptable risk levels are approached.” (CC3.1.5.c)</p> <p>It is not clear from the information presented in the scoring rationale how the HCRs act to do this.</p> <p>In particular, the HCRs appear to lack any criteria for determining whether a mussel bed comprises solely of seed mussels and is a location where survival to maturity is unlikely. As stated, the HCRs risk allowing seed mussel dredging in areas where mussels may survive to maturity.</p> <p>Scoring issue a This text outlines a procedure which is considered to form an appropriate harvest control rule for the stock.</p> <p>It is good to see that there is now an all-Ireland</p>	<p>Given the fact that the fishery only targets ephemeral beds, unacceptable levels of risk, as defined in the RBF, will not be approached.</p> <p>By restricting harvesting to seed mussel beds the harvest strategy acts to maintain the susceptibility of the parent stock at acceptable levels.</p> <p>The areas in which the fishery operates are areas where beds are historically known to be ephemeral in nature. Sheltered inshore areas such as the Malahide Estuary where significant volumes of adult mussels are known to be present are not targetted.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>HCR in place for managing the seed mussel resource.</p> <p>However, looking at the rationale for SIc, it is not at all clear that this procedure works at all. SIc reports that the resource allocation granted to the fleet each year is in excess of the exploitable resource (albeit for the period 2004-11).</p> <p>The fundamental issue, however, with the rationale is that no evidence is presented to show that the HCRs that are in place include any rules that would act to reduce exploitation rates as a limit reference point is approached, however this may be defined. The only text that states this is the case is the unsupported recital of the SG80 text at the start and end of the rationale; the text in between these sentences describes HCRs that seem to lack this vital feature.</p> <p>It is understood that the seed mussel stock is robust, productive and ephemeral; and also that the absence of reference points has required the use of the RBF. However the MSC requirements are constant and unwavering.</p>	<p>Yes, the resource allocation granted to the fleet each year is in excess of the exploitable resource, but this is because the resource allocation is designed to prevent ecosystem impacts in on-growing areas through oversaturation with mussel seed if such an abundance of seed became available.</p> <p>The fact that the seed mussel beds are ephemeral implies that the fishery could in theory take 100% of the available seed without having an adverse impact on the parent stock.</p> <p>There are two limits in place for this fishery 1) seed mussel fishing in RoI waters of the Irish Sea is not permitted unless 1,000 t of available seed has been identified and 2) on-growing areas cannot be stocked beyond 30 t/ha. The former is designed purely to prevent unnecessary habitat damage through highly inefficient fishing while the later is designed to prevent ecosystem impacts due to overstocking.</p>

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				<p>The assessment needs to be revised to explain the harvest control rule(s) that act to reduce exploitation rates (or in this case ensure that the susceptibility of the stock to fishing is maintained).</p> <p>Scoring Issue b The spatial and temporal uncertainty of seed mussel bed development are certainly significant uncertainties. It is clear that an expeditious management regime has been established to allow a swift response to the availability of seed mussels.</p> <p>What is not clear here is that the harvest control rules manage risk appropriately. There is an uncertainty with any seed mussel bed about whether it is likely to prove ephemeral (and thus that it is appropriate to fish the bed for seed mussels) or whether it is likely to persist and survive to maturity.</p> <p>It is implicit from the text provided elsewhere in the report that scientists are aware of where seed mussels are likely to persist and where they will be ephemeral. Some evidence should be presented here to demonstrate that this</p>	<p>Agree. No response required.</p> <p>The likelihood that a mussel bed will survive to maturity is assessed based on historical knowledge and information relating to tidal/predator dynamics in a particular area. As is discussed extensively mussels are ubiquitous around the island of Ireland and fishing seed beds is not likely to create a risk to the mussel stock.</p> <p>As is presented in the text permanent mussel beds are usually intertidal. There is awareness of where mussel beds are likely to persist and these areas are not fished.</p>

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				<p>uncertainty it taken into account in the HCRs in order to fully justify the SG80 score.</p> <p>A further uncertainty (according to the rationale for PI1.2.3 SIa) is that:- "...the stock and recruitment dynamics of the mussel populations are not well understood. For example, little is known about the stable populations that are the likely source of the spat mussels which settle on the ephemeral beds from which seed mussels are harvested."</p> <p>If this is the case, it should be addressed through a precautionary management approach with respect to harvesting of adult wild mussels that may be the source of mussel spat. No information is provided to indicate that there is an HCR in place to achieve this (such as, for instance, a MLS that is greater than the size at maturity).</p> <p>Scoring Issue c The wording of the scoring rationale illustrates a situation that does not seem to be compatible with the MSC standard. It states that:- "Landings have been well below the maximum allowed catch (the sum of individual resource allocations) in the last few years due to lack of</p>	<p>Beyond perhaps some potential recreational hand gathering, wild mussels of adult size are not fished commercially. They are ubiquitous around the coastline of Ireland in the inter-tidal zone. A HCR to manage impacts on the adult wild mussels is not necessary due to their not being fished.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>available seed. Data from SFPA show that the average resource allocation uptake in Ireland from 2004 – 2011 was 45.5% (Declan Quigley, SFPA, pers. comm.), so there is no available evidence in recent years that the resource allocation can indeed control exploitation rate. This would only be shown clearly if the overall resource allocation was lower than the biomass of available seed. Under the current harvest strategy this is unlikely to occur because the current harvest strategy is designed to provide sufficient seed mussel for re-laying on licensed cultivation sites within IE and NI on a continuous basis, and does not vary in relation to annual fluctuations in availability of seed mussels.”</p> <p>This text is presented to justify that SG100 is not met.</p> <p>However, this text indicates that the allocation of the catch is not adjusted to match the availability of the resource, but is determined by demand, and that the resource allocations issued in the period 2004-11 were in excess of the availability of seed. On the basis of this evidence and the team’s rationale for not awarding the SG100 score, it is not at all clear that SG60 or 80 are met.</p>	<p>As stated previously this allocation is not meant to match the availability of the resource it matches the amount of ground available for re-laying. It sets a precautionary upper limit on the amount of seed that can be relaid to prevent undesirable ecosystem impacts.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>A further concern here is that the time series that this observation relates to is 7 years ago. There is no indication that any more recent information has been obtained by the assessment team to determine whether the situation has improved over the previous period of certification and whether catches are now better aligned with resource availability.</p> <p>The currency of the information available is especially important given that Sla expounds the features of a new HCR which was implemented in 2016; no information is presented in Sic that is relevant to the period that the new HCR has been in place.</p> <p>It is hard to justify a score of more than 60 here in the absence of recent evidence about the effectiveness of the harvest control tools particularly in the period since the new HCR has been in place.</p>	<p>Again this is not the intention of the allocation system. In theory because the beds are ephemeral the fishery could take 100% of the available seed mussels without negatively impacting the parent stock.</p> <p>The HCRs in this fishery are primarily aimed at ensuring the maximum return is achieved from the available seed while also controlling unnecessary impacts on the wider environment (e.g. through overstocking of bays or through fishing for seed when none is available).</p> <p>For the reasons outlined above, more recent evidence of the sort the Peer Reviewer is suggesting would not change the picture here. There is ample evidence of the harvest strategy achieving its objectives, which are in turn appropriate to the particular characteristics of the fishery (i.e. the ephemerality of the seed mussel beds); the score for this PI remains as originally scored.</p>
1.2.3	No	No	NA	<p>Scoring Issue a</p> <p>The rationale omits to mention relevant information about stock structure that has been</p>	<p>A new section has been added to the report to present this information.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>commissioned by BIM (see PI1.1.4) or published in the literature (Beaumont et al, 2007), which shows that all-Ireland stock structure comprises two species and a hybrid species, with distinct differences around Ireland.</p> <p>A score of 80 would seem appropriate for this SI if all of the relevant and up-to-date information was cited.</p> <p>Scoring Issue c The scoring rationale states that there is good information on all other fishery removals from the stock; but no such information is presented anywhere in the report. This is particularly important given that many of the assumptions in the report depend upon the notion of there being an all-Ireland (and all-Irish Sea) mussel stock.</p> <p>The rationale mentions that detailed information is available on the biomass of seed mussels harvested in the eastern Irish Sea for relaying in England and Wales, but does not cite any figures that describe this activity, nor list any references to show that the team has reviewed this information.</p>	<p>The original score of 80 for this PI stands.</p> <p>As is clearly stated in the rationale for SIc, there are no other significant removals of seed or adult mussels on the Irish coast that would have any impact on stock dynamics. Information on removals in this fishery are already presented in the Total Allowable Catch (TAC) and Catch Data section of this report.</p> <p>The latest surveillance report of North Menai Strait mussel has been added as a reference.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				The score of 80 would seem appropriate if some evidence is presented to show the general magnitude of other fishery removals from the stock.	The original score of 80 for this PI stands.
1.2.4	NA	NA	NA	The team has correctly awarded a default score of 80 for this PI because the RBF was used for PI 1.1.1	No response required.
2.1.1	No	No	NA	<p>There is insufficient information in the report to justify such a high score.</p> <p>For the seed mussel fishery and for relaying operations it is an acceptable argument that any non-target species caught in the fishery are returned to the sea; they are essentially discarded.</p> <p>For the final harvest of mussels, it is not generally the case that non-target species are removed from the catch whilst the vessel is still at sea; generally sorting of the catch takes place after landing. Non-target species that are caught and landed must be regarded as "retained" species, irrespective of their commercial value (see PI2.2.2 Sla).</p> <p>Unless evidence can be presented that the IE</p>	<p>Comment was noted however as stated in the text: <i>"Logbook data and inspections have uniformly shown no species other than undersized mussels"</i>.</p> <p>Since they are the target species, the undersized mussels are not considered a retained species.</p> <p>Therefore, the team has determined that this information sufficiently demonstrates that there are no main or minor retained species in the fishery.</p> <p>According to MSC CR v1.3 CB3.5.3: "(...) if</p>

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				<p>and NI fleet all sort their catch at, then it is highly probable that there must be at least some retained non-target species when mussels are harvested at the end of the production cycle.</p> <p>Whilst an SG80 score is plausible for this fishery, the requirements of the very high SG100 standard are not met by the information presented.</p>	<p>there are no P2 retained species in the fishery, or <u>retention is exceptionally rare and negligible in its impact</u>, then the fishery would meet SG100.”</p> <p>Logbook data and inspections records represent the “norm” in this fishery. What the Peer Reviewer is refering is the the rare occasion when some other non-target species might accidentally be retained. The Assessment Team considered the potential risk posed by such impacts to be negligible; therefore, while it might be the case that at least some retained non-target species are harvested at the end of the production cycle, the Assessment Team are confident that SG100 is met. No changes to scoring have been made.</p>
2.1.2	No	No	NA	<p>Scoring Issue a The SG100 score is not justified adequately.</p> <p>The MSC define a strategy in GCB3.3 as:- “A “strategy” represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which</p>	

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				<p>should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery, and could include voluntary or customary arrangements, agreements or practices, codes of practice (if they can be demonstrated to be working). A strategy should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.”</p> <p>It is not clear from the scoring rationale that there is a “strategy” in place that meets this definition.</p> <p>There is nothing in EU or national legislation to prohibit the catch of the non-target species that are listed in the report.</p> <p>Although the design of mussel dredges is not conducive to the capture of non-target species, this is a consequence of optimising the design to</p>	<p>There is a cohesive, deliberate and effective management strategy in place that manages the fishery practice of not retaining anything other than mussels, as described in the text. The 'strategy' can be considered to be inherent in how the fishery operates (leading to 'negligible' retained species) and is supported and backed up by on-going monitoring and oversight.</p> <p>A strategy does not need to prohibit the catch of non-target species.</p> <p>While it may be somewhat serendipitous rather than by-design, the fact remains that mussel dredges do not generally catch much</p>

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				<p>catch mussels rather than a deliberate strategy to minimise capture of non-target species.</p> <p>Secondly, the rationale refers to whether or not mussel dredges could catch non-target species in a commercially viable manner; this is irrelevant.</p> <p>Finally, the rationale focusses on the seed mussel fishery and does not consider the catch of non-target species that will arise from harvesting of mussels from on-growing areas, where non-target species (such as green crab and starfish) are often abundant and could be caught in considerable numbers in mussel dredges.</p> <p>The rationale presented provides evidence of a “partial strategy” (SG80) but not a “strategy”. Unless further evidence is presented, the lower score would be more appropriate.</p> <p>Scoring issue b As noted in the comments on PI2.1.1, there is inadequate evidence in the report to show that the UoC has no main or minor retained species.</p>	<p>non-target species and this is supported by evidence.</p> <p>It is relevant in that were it commercially viable to retain non-target species there would be an incentive to do so.</p> <p>Predator control is practiced in many on-growing areas so the abundance of predatory species is likely less than the Peer Reviewer suspects. This predator control takes the form of fishing of green crabs and/or the ‘mopping’ of starfish.</p> <p>The rationale has been reworded to lend further support to the SG100 score.</p> <p>The issue of “inadequate evidence to show that the UoC has no main or minor retained species” is addressed in the response to PI2.1.1 above.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>The rationale states that: "As the UoC has no main retained species, this PI meets the SG60 and SG80 scoring guideposts."</p> <p>There is no "main retained species" qualifier at SG60 or 80, so this justification is inappropriate.</p> <p>The rationale supporting the SG100 score is also inadequate: it is limited to the seed mussel fishery alone; and it also refers to good compliance with spatial controls without explaining why this has any relevance to the catch of non-target species (and if it does, it is not clear why this is not mentioned as part of the "strategy" referred to in SIa above). It is also not clear why the "appropriate assessments" (presumably a reference to an assessment</p>	<p>Yes it's true that there is no explicit main/minor qualifier in the SGs for SIb. However, SIb follows directly on from SIa which does have such qualifiers (e.g. for SIb SG80: "There is some objective basis for confidence that the partial strategy will work (...)". Additionally MSC have previously provided an interpretation (Log ID 1535 – see Relevant MSC Interpretations for details) which, although it pertains specifically to V2.0, is also of direct relevance here which states that "Although it is not specified in the requirements, the MSC's intent is that the 'if necessary' in scoring issue (a) also pertains to scoring issues (b) and (c) [for PIs 2.1.2, 2.2.2, 2.4.2 and 2.5.2]". Therefore, the justification as written is appropriate.</p> <p>The rationale has been reworded to clarify why SG100 is met.</p> <p>The reference to appropriate assessments has been removed.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>carried out as part of the requirements of Article 6 of the Habitats Directive) have any relevance here.</p> <p>Again, with the addition of appropriate and additional information a score of 80 would seem appropriate here.</p> <p>Scoring Issue c The scoring rationale is inadequate to support such a high score.</p> <p>As already noted, the evidence that there are no retained species from any part of the fishing activity (including harvesting at the end of the cultivation cycle) is lacking in the report.</p> <p>Scoring issue d If there is a strategy with an objective, the team should cite the strategy and quote the objective.</p> <p>There is no evidence in the report that there is a strategy for managing retained species and hence no objective.</p> <p>Unless the strategy (<i>sensu</i> GCB 3.3.) can be cited and its objective quoted, there is no basis for</p>	<p>The original score stands at SG100.</p> <p>Disagree. Inspections and harvest records provide clear evidence that no other species are retained.</p> <p>The issue of the adequacy of evidence that there are no retained species is addressed in the response to PI2.1.1 above.</p> <p>The team has clarified the strategy which is herent in how the fishery operates and whose objective is to retain mussels (to the exclusion of other species). There is ample evidence in the report for managing retained species and the objective is implicit in that the fishery strives to only retain mussels.</p> <p>The SG100 score stands as originally scored.</p>

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				scoring 100 for this SI.	
2.1.3	No	No	NA	<p>It seems very unlikely that no species other than mussels are landed by dredgers at any point in the production process.</p> <p>Some evidence is presented to show that scientists have looked at the abundance of non-target species on seed mussel beds.</p> <p>The only evidence presented in support of the assertion that no species other than mussels are retained and landed at the end of the harvesting process is that there are no reports of retained species and that officials are unaware of them. The rationale also indicates that processing plants do not monitor the quantity of non-target species in the catch.</p> <p>It would be correct to conclude from this information that there is no evidence of any catch of non-target species. However there is also no evidence that there is no catch of non-target species other than anecdote.</p> <p>The scoring rationale requires substantial further justification to support a score of more</p>	<p>Yes but as discussed previously any species that might be inadvertently retained would constitute negligible species.</p> <p>As explained in the text there are routine inspections for both mussel seed harvest and harvest size mussels, these are sufficient to confirm that there are no retained species other than mussels. There is logbook data from inspections carried out by the SFPA, and DAERA to support the assertion that no species other than mussels are retained and landed.</p> <p>Not true. Is the absence of non-target catches from official reports not in and of itself evidence that there is no/negligible catch of non-target species? The Peer Reviewer is in effect asking the team to prove a negative here.</p> <p>The score of 95 stands as originally scored.</p>

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				than 80.	
2.2.1	NA	NA	NA	The RBF has been used to score this PI, and comments are made on this in the appropriate table below.	No response required.
2.2.2	Yes	Yes	NA	The scoring seems broadly appropriate.	No response required.
2.2.3	No	No	NA	Scoring Issue a This SI does not consider the whole cultivation process: it refers to seed mussel collection and relaying of mussels, but not the quantity of bycatch (discards) in the final harvest at the end of the production cycle.	Information added to the rationale about the cultivation sites: "At cultivation sites similar low levels of bycatch have been reported by fishers, but no formal data was available. Nevertheless, it can be assumed that seed mussel beds and mature mussel beds are functionally very similar. In fact lower numbers of predators and scavengers might be expected to live on mature mussel beds (i.e. less bycatch) as they are less vulnerable to predation compared to seed mussel beds (Beadman et. al 2004)."
2.3.1	No	No	NA	It is stated that an "appropriate assessment" has been carried out for all cultivation activities within or adjacent to protected areas. There is no evidence presented here or anywhere else in the report that shows where these protected areas are located relative to	No comment required Locations of protected areas in relation to cultivation sites or harvesting areas was provided in the initial report in 2013. It was

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>cultivation or seed mussel harvesting areas.</p> <p>There is no list anywhere in the report of the appropriate assessments that have been examined by the assessment team to determine that there is indeed no direct or indirect impact on ETP species.</p> <p>Provision of this additional information may justify the score awarded; in the absence of such information a lower score would be appropriate.</p>	<p>deemed to be unnecessary by the assessment team for this report. The Guidepost for PI 2.3.1 <i>'There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.'</i> The relevant ETP species have been listed and fishing is closed in sites that require appropriate assessment.</p> <p>The reference section of the report lists the appropriate assessments that have been examined by the assessment team.</p> <p>No additional information is required to justify the score awarded by the assessment team.</p>
2.3.2	No	No	NA	<p>As noted above, some evidence should be presented in the report to show where the SPAs and SACs are located, and also to demonstrate that the assessment team has reviewed the appropriate assessment for each area to confirm that the strategy is being implemented.</p> <p>The rationale would also benefit from some clarification of the purpose/basis of different EU Natura 2000 sites (Special Protection Areas for birds; Special Areas of Conservation for habitats / species).</p>	<p>This information can be found in the initial report but was deemed unnecessary for this report. All appropriate assessments and tests of significance were reviewed by the assessment team and referenced in the reference section.</p> <p>This information is provided in section 4.4.5 of the report.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				Provision of this information would justify the score awarded; in the absence of such information a lower score would be appropriate.	
2.3.3	No	No	NA	Again, evidence of the location of SACs & SPAs as well as some evidence that the relevant appropriate assessments have been inspected would justify the score awarded.	<p>Again, this information can be found in the initial report but was deemed unnecessary for this report. All appropriate assessments and tests of significance were reviewed by the assessment team and referenced in the reference section.</p> <p>This information is provided in section 4.4.5 of the report.</p>
2.4.1	No	No	NA	<p>The scoring rationale does not adequately cite the literature (such as Beadman, 2004) cited elsewhere in the report which is necessary to support the score awarded.</p> <p>A revision of the scoring rationale is required to support the score awarded.</p>	<p>References have been added.</p> <p>The rationale is sufficient to warrant the score awarded. There is a clear explanation of how the fishery affects the habitat structure and the estimated time of recovery. Evidence of control and impact assessment prior to licencing is provided.</p>
2.4.2	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.3	No	No	NA	<p>If information about habitats is available, then where is it? There are no maps or data presented in the report or scoring rationale to show that the nature, distribution and vulnerability of habitat types in the fishery are known.</p> <p>If this information is presented then a score of SG80 or more would seem appropriate. In the absence of such information a lower score would be appropriate.</p>	<p>This PI asks if The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types. The references in this PI list all the reports that show that the information is available and is being constantly collected and updated.</p> <p>Additional maps have been added to the background Section relating to closed areas and habitats (see Figure 6 and Figure 7).</p>
2.5.1	Yes	Yes	NA	The scoring would be better supported if further information on the studies of carrying capacity was presented in the report.	Further information on the studies of carrying capacity (SMILE and UISCE projects) are presented in section 4.4.7.
2.5.2	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.
2.5.3	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.
2.6.1	No	No	NA	<p>The scoring is inappropriate. There is no consideration of invasive non-native species other than <i>M. galloprovincialis</i>.</p> <p>There are other invasive non-native species that should be considered: notably Chinese mitten crabs (<i>Eriocheir sinensis</i>); slipper limpets (<i>Crepidula fornicata</i>); and most importantly the</p>	Slipper limpets and <i>Didemnum</i> were discussed in the background information. This information has been added to the scoring rationale. Information on Chinese mitten crab (<i>Eriocheir sinensis</i>) has been added to the introduction, this is thought to have been introduced by ballast water.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>carpet sea squirt <i>Didemnum vexillum</i>.</p> <p>All of these species have the potential to be translocated with seed mussels; and in the absence of a management regime to address this it is not possible to justify the score awarded.</p>	<p>There are strict management controls as explained in the rationale with official authorisation required and control measures in place.</p>
2.6.2	No	No	NA	<p>The scoring is not appropriate.</p> <p>It is clear that BIM have been very active in developing a strategy and in screening seed mussels before stocks are moved; however the scoring rationale states that: "However a key challenge for the process is identifying what action should be taken by whom in the event that an invasive alien species is found by an aquaculture operator or at an aquaculture facility. To ensure the effectiveness of Biosecurity Plans it is important that aquaculture operators understand and trust the process and the consequences in the event that an invasive species is confirmed. To date risk assessments and draft biosecurity plans have been developed by a number of aquaculture businesses. Operators have committed to adopting best practice to maximise the opportunity to identify any alien species that</p>	<p>The SI Guide post asks if there is a strategy in place for managing the impacts of translocation on the surrounding ecosystem. This strategy is outlined in the text. The text was written in a way which outlines how and why the strategy came about and the 'key challenge' that it has to overcome during implementation. Risk assessments have been carried out and Biosecurity plans are in place. Training workshops are being carried out to keep the operators up to date with the process. The identification of <i>Crepidula</i> in Belfast Lough was given as an example of how the prevention of the spread of this organism is being investigated.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>may be present and to minimise the risk of spread linked with daily operations e.g. with stock movements.”</p> <p>It would appear from this text that although BIM have developed procedure that might be regarded as a strategy, it has not yet been implemented by operators; at best there is a commitment to do something in the future, rather than evidence that a strategy is in place right now.</p> <p>On the basis of this information it is clear that while a score of SG60 is warranted, a score of less than SG80 would be appropriate, with an associated condition to encourage operators to carry out risk assessments and produce biosecurity plans.</p> <p>Finally, it is not at all clear why the rationale or the report in general does not refer to the EU Invasive Alien Species Strategy and EU Regulation 1143/2014, which provides the key EU-wide foundation for managing Invasive Alien Species. This is a major omission.</p>	<p>The score is appropriate as the risk assessments and biosecurity plans are being implemented as stated in the text.</p> <p>This is referred to by citing ‘Invasive Species Ireland’ which acts as a co-ordination mechanism based on the regulation. The Regulation has been added to the references.</p>
2.6.3	No	No	NA	The scoring is not appropriate: it relies on an old	Information is sufficient to adequately inform

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>report from 2004 and two hyperlinks, one of which is broken and other which shows the distribution of key Invasive Non Native Species at the national level rather than showing the location of records within nations.</p> <p>There is no evidence presented either here or elsewhere in the report to show the results of the monitoring that is said to be taking place.</p> <p>For Invasive Alien Species, which can spread swiftly, it is not appropriate to score this PI on the basis of such limited and dated information.</p> <p>There are many readily accessible and more current publications which document the location of Invasive Alien Species in the UoA and the risks associated with them.</p> <p>To justify a score of more than 60 the rationale should present more current and more detailed information.</p>	<p>the risk and impact assessments required in the SG80 Translocation management level of performance (PI 2.6.2). The broken hyperlink has been replaced.</p> <p>The example of Crepidula identification in Belfast Lough and the resulting restrictions on movement of stock out of the Lough to other areas is an example of the measures that can be taken.</p> <p>More information has been added to the rationale that clarify what information is available.</p>
3.1.1	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.
3.1.2	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.3	Yes	No	NA	It is not clear from the rationale presented how the long-term objectives are "required" by management policy at SG100. Further justification is required for this score.	It is already stated in the text that both competent authorities are bound to the principles and policies of the CFP which enforces on those authorities the requirement that the fishery in both Jurisdiction s be managed sustainably. Further evidence is not required.
3.1.4	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.
3.2.1	No	No	NA	<p>No evidence is presented to show that sort and long-term objectives are <u>explicit</u> within the fishery's management system.</p> <p>The rationale presented states that a review was conducted in 2008. It is not clear how and to what extent the recommendations of this review have been adopted by the relevant management bodies.</p> <p>To justify the score of SG80, it would be necessary to identify and list the explicit short and long-term objectives that are in place in IE and NI for this fishery.</p>	<p>The long-term objectives of the fisheries management system, in both jurisdictions, are explicitly stated as being the sustainable management of the resource. This is also the stated aim of the European fisheries management framework the CFP, to sustainably manage the natural resources while maximising economic return.</p> <p>There is also a roadmap of compliance for the licensing system, a review of the licensing system and a FNP for the seed fishery which has a short term timescale and is reviewed/rewritten every 3 years. In addition all licenses in Natura areas are reviewed as part of the SAC process.</p>
3.2.2	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.3	No	No	NA	<p>Scoring Issue a The scoring rationale describes the characteristics of the MCS system in place, but does not present evidence to support the view that it has demonstrated an ability to enforce relevant management measures/strategies rules.</p> <p>It is clear from other parts of the report that such evidence exists, and that information should be presented here to justify the score adequately.</p>	<p>The high level of compliance/lack of any indication of non-compliance is itself evidence of the MCS systems capability with respect to enforcing relevant rules.</p> <p>Enforcement personnel for both Jurisdiction s were consulted during on-site activities and did not identify any areas of concern with respect to the effectiveness of current MCS systems.</p>
3.2.4	Yes	Yes	NA	The scoring is appropriate and well justified.	No response required.
3.2.5	No	No	NA	<p>Scoring Issue a This PI tests the review of the performance of the management system; this is different from determining an appropriate resource allocation based on the abundance of seed mussels and environmental impacts.</p> <p>The scoring rationale requires revision to ensure that it addresses the issues tested by the PI.</p> <p>Scoring Issue b Again, this SI is concerned with the process in place for review of the management system,</p>	The rationale has been modified to ensure it specifically addresses the PI.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				<p>rather than how the management system responds to fluctuations in resources.</p> <p>Evidence is required to demonstrate the processes in place for internal and external review of the performance of the management system in both IE and NI to justify an appropriate score for this SI.</p>	

Any Other Comments

Comments	Conformity Assessment Body Response
No.	No response required.

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
1.1.1	Yes	No	<p>The RBF process is explained and presented very well.</p> <p>There are however some aspects of the procedure that has been followed that require attention, and will require a repeat of some of the SICA and PSA scoring. The reasoning for this is set out below.</p>	The Assessment Team has further considered the impact that including both Welsh mussels and the Welsh seed mussel fishery in this analysis would have on the outcome of this analysis and has concluded that including both mussels and fishing activity from Wales would not lead to any substantive changes to the score for either the SICA or PSA component of the

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
			<p>Procedure</p> <p>MSC CRv1.3 states that for Principle 1, the SICA should be performed for all fishing activity affecting the stock (CC2.3.2.1.a.i); and likewise for the PSA there is a requirement that each fishery affecting the target stock shall be identified and listed separately; and that for stocks upon which there are multiple fisheries, susceptibility attributes shall be combined (CC2.4.2.2.1).</p> <p>There is no evidence that these requirements have been followed properly for the SICA or PSA analysis.</p> <p>As noted in earlier comments, there are seed mussel fisheries referred to in the report that take place in the eastern Irish Sea that are considered to exploit the same stock unit as that under assessment, but these are not considered here.</p> <p>Further to this, there is no evidence that the removal of adult mussels from the stock has been taken into account. The MSC CR provides no basis for ignoring removals of adult mussels from the stock.</p> <p>The SICA and PSA must be revised to ensure that they meet CRv1.3 requirements by taking account of all fishery removals (of both seed mussels and adults).</p>	<p>RBF. With this being the case further rationale has been added to both the SICA and PSA scoring tables to clarify this issue.</p> <p>In terms of the SICA component of the RBF the direct capture of seed mussels was identified by stakeholders to be the activity with the greatest potential to cause risk to the mussel stock. The Assessment Team when writing the rationale for the worst plausible case scenario did not make it sufficiently clear that the worst plausible case scenario related ONLY to the impact of direct removals of seed mussels, due to fishing, on mussel stocks; this has now been made explicit.</p> <p>With respect to the impacts of removing adult mussels, this issue is addressed throughout the report. The adults that are removed at the end of the production cycle are individuals that would have been washed out before they had a chance to spawn had they been left in place on the ephemeral beds; therefore, in effect the fishery removes adults that are only there because of the fishery. The fishery also imparts the additional advantage of allowing those adult mussels to contribute through several spawning cycles to the wider mussel stock. With all this being said, and to add clarity, supporting rationale related to the parent stock has been added to the PSA and SICA tables.</p>

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
			<p>References References are not presented to support the productivity scores awarded. There is plenty of scientific information available on the productivity of mussels, which should be cited here.</p> <p>Susceptibility Spatial overlap - the scoring of spatial overlap is not appropriate. As already noted, this should take account of all fishery removals by all fishers from the stock(s) under assessment (including removals outside the UoC), and not just seed mussel removals by the UoA operators.</p> <p>Selectivity - the harmonisation of the scoring of selectivity attributes for dredges with other mussel dredge fisheries is sensible.</p> <p>Post capture mortality - the score awarded does not seem appropriate. This attribute has to be scored in accordance with Table CC16 of MSC CR v1.3. Whilst it is true that there is evidence of post-capture release and survival of seed mussels (“low susceptibility”); it is also true that seed mussels are a retained species (“high susceptibility”).</p> <p>Ultimately all of the seed mussels gathered from the wild will either die during cultivation or when they are harvested at the</p>	<p>References added.</p> <p>Spatial overlap – response: The Assessment Team has considered the impact that including both Welsh mussels and the fishery and concluded that their inclusion does not lead to any substantive changes to the score for either the SICA or PSA component of the RBF. Further rationale has been added to both the SICA and PSA scoring tables to clarify this issue.</p> <p>No response required.</p> <p>The Peer Reviewer’s point here is accepted. Regardless of whether or not the mussels are alive on re-laying and indeed following final harvesting, the ultimate intention of the fishery is to remove them from the overall stock.</p> <p>The Post capture mortality score has been changed from 1 to 3 resulting in a revised overall MSC score of 96.0 and a change to the cumulative P1 score from 83.3 to 82.7.</p>

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
			end of the cultivation process. It would seem more appropriate both on procedural and practical grounds to score Post Capture Mortality as “High”.	
2.1.1	NA	NA	NA	No response required.
2.2.1	Yes	Yes	<p>The report presents SICA tables for spider crabs in seed mussel fishing areas and for green crabs in ongrowing areas.</p> <p>In both cases the SICA consequence score is equivalent to an MSC score of 100.</p> <p>This scoring and the supporting rationale are appropriate and very clearly presented.</p> <p>In the case of these two species, the assessment team has correctly considered only the impacts of the UoA, and not the impacts of all fisheries.</p>	No response required.
2.4.1	NA	NA	NA	No response required.
2.5.1	NA	NA	NA	No response required.

For reports assessing enhanced fisheries:

<i>Does the report clearly evaluate any additional impacts that might arise from enhancement activities?</i>	Yes	Conformity Assessment Body Response:
<p><u>Justification:</u> The report has addressed the issues associated with enhanced fisheries (through the amendment of the default assessment tree).</p> <p>Comments have been made on the PIs that have been added to the assessment tree as appropriate.</p>		<p>No response required.</p>

8.2.2.2. Peer Reviewer B – Follow-up comments at PCDR stage

On 19th June 2018 SAI Global received further comments from Peer Reviewer B relating to the assessment team's responses to their comments at the initial peer review stage. The Peer Reviewers additional comments along with the Assessment Team's responses to each interspersed throughout are outlined below.

Overall Comment

I made extensive and really rather critical comments on the Peer Review draft report. The assessment team has responded to these comments by including new information in the report and making changes in response to the comments.

I must commend the team for a patient and thorough response to the extensive comments that I made. I feel that these have addressed most of the concerns that I raised.

However I still have concerns in a number of areas:-

- **Stock status** – I am still not convinced that the assessment takes account of the entirety of the mussel stock or all fishery removals from it.
[The Assessment Team are confident that all significant removals of mussels have been considered.](#)
- **Harvest strategy/control rules** – it is still not clear how these are responsive to the state of the stock. It still seems that the extent of the seed mussel harvest is determined by the extent of and maximum relaying density in cultivation areas, rather than the abundance of seed mussels.
[That is because that is absolutely the case, a fact that has been repeatedly stated by the Assessment Team and which has already been discussed extensively in this report. The reasons the harvested strategy is constructed in the way it is to account for seeds mussels being an ephemeral resource.](#)
- **Non-target species** – on the basis of the response to my comments, it is now clear that predator control (for green crab and starfish) is an integral part of the cultivation of mussels. This really should be considered somewhere in Principle 2, I think in either PI 2.1.1 or PI 2.2.1.
[The 'predator control' referred to by the Assessment Team is discussed in the specific comments to issues raised by the Peer Reviewer below.](#)

Finally, whilst appreciating and accepting the teams new information about mussel population structure around the island or Ireland, I remain rather concerned about the compatibility of the assessment with respect to MSC UoAs and/or "Indistinguishable or Practically Inseparable" (IPI) species. I still feel that this needs further consideration.

[The existence of two species and one interspecific hybrid within the UoA has already been acknowledged and addressed by the Assessment Team. Based on the available evidence the Assessment Team is satisfied that bottom grown mussels are likely to be *Mytilus edulis* and contain at most negligible volumes of other *Mytilus* species.](#)

Overall, these are mostly procedural details which I am sure can be readily addressed. I am certain that the fishery deserves to be certified.

Peer Reviewer's Outstanding Issues

List any outstanding issues you have with the CAB's responses to your comments on PI scoring.

Performance Indicator	Outstanding Issue (provide clear justification)	Certifier Response
<p>1.1.1. Stock status</p>	<p>In response to concerns raised about the fishery removals from the eastern Irish Sea, the assessment team has added some text about fishery removals associated with the Menai Strait mussel fishery.</p> <p>There is no evidence in the report to show that the other mussel fishery removals from wild stocks (of both seed and adult mussels) in the eastern Irish Sea are taken into account. There can be extensive fisheries for wild mussels along the Welsh, English and occasionally Scottish coasts. Depending on stock status and market conditions, thousands of tonnes of seed and adult mussels may be harvested from these areas.</p> <p>The team has still not presented evidence that the PSA has been conducted correctly. The CR requires that each fishery affect[ing] the target stock is identified and listed separately (CC2.4.2.2.1); and that the susceptibility scores shall be entered into the MSC PSA worksheet, prior to a weighted mean PSA score being calculated. Further to this, the MSC template for reporting and FCR Annex PF4 require that the MSC PSA worksheet is included in the report; it is not.</p> <p>In the absence of this information it is still not possible to determine that the PSA has been carried out correctly.</p> <p>I would therefore ask the assessment team to document all fishery removals as required by the CR, and to score susceptibility for each fishery affect the mussel stock, and then to display this information in the report as required by the MSC CR.</p>	<p>The addition of that statement was intended to account for the other fishery that is responsible for substantial removals of mussels (the Menai Strait fishery). Other fisheries in the Irish Sea for adult mussels (commercial/recreational handpicking) are negligible relative to the size of the stock.</p> <p>All significant removals of mussels for which information was available have been accounted for. In addition the fact remains that mussels are not fished, or fished in a very trivial fashion by hand-gathering, over most of their range within the UoA and the wider Irish Sea.</p> <p>The PSA is consistent with the both the original assessment and that conducted during the MSC re-assessment of the Menai Strait fishery in 2015. All of the components of the PSA worksheet were already presented but the PSA worksheet itself has now been added.</p> <p>The Assessment Team have already considered all significant removals of mussels. The susceptibility score for both fisheries are identical and as a result weighting and then combining them does not have any impact.</p>
<p>1.2.1. Harvest strategy</p>	<p>I accept the argument that the susceptibility risk is maintained with respect to the PSA attributes – this point is well made.</p> <p>However, the assessment team has not addressed the concern that the harvest strategy is not responsive to the state of the seed mussel stock, but is designed to provide an adequate supply of seed mussels for ongrowing areas.</p>	<p>No response required.</p> <p>The Assessment Team feel that they have adequately addressed this concern and have specifically stated that the harvest strategy is, due to the ephemeral nature of the seed mussel resource, is not designed to be responsive to the state of the parent stock.</p>

Performance Indicator	Outstanding Issue (provide clear justification)	Certifier Response
	<p>The concerns raised in connection with PI1.2.2 below are relevant here – not least being that the information on the relationship between resource abundance and allocation covers the period 2004-2011. All of this information pre-dates the current period of MSC certification.</p> <p>If the fishery is as well managed and documented as stated in the report, it should be easy to provide a more up-to-date time series of information, without which it is very hard to substantiate the score here.</p> <p>I would urge the team to present some more up-to-date information in support of their conclusions, and also to revisit the rationale.</p>	<p>This issue is addressed in the response to PI 1.2 below.</p>
<p>1.2.2. Harvest Control Rules and tools</p>	<p>I raised the concern under this PI that the allocation of catch is not adjusted to match the availability of the resource, but is determined by demand, and that resource allocations in the period 2004-11 were in excess of the availability of seed.</p> <p>The response to this observation seems to agree with my concern. The response is that:</p> <p><i>Yes, the resource allocation granted to the fleet each year is in excess of the exploitable resource, but this is because the resource allocation is designed to prevent ecosystem impacts in on-growing areas through oversaturation with mussel seed if such an abundance of seed became available.</i></p> <p>This response confirms the concern that I had raised, which is that the harvest controls are based upon demand. Operators are given a seed mussel allocation based on the extent of their cultivation areas (apparently to avoid adverse ecosystem effects in these areas), rather than based on the abundance of seed mussels.</p> <p>Finally, I raised concern that the most recent information on seed mussel allocation and harvest was for the period 2004-11. There is no evidence from recent years; the response to this observation is that:</p> <p><i>For the reasons outlined above, more recent evidence of the sort the Peer Reviewer is suggesting would not change the picture here. There is ample evidence of the harvest strategy achieving its objectives, which are in turn appropriate to the particular characteristics of the fishery (i.e. the ephemerality of the seed mussel beds); the score for this PI remains as originally scored.</i></p>	<p>Yes, the Assessment Team do not disagree with anything the Peer Reviewer has indicated here. In fact the Assessment Team have been very upfront throughout the assessment process that this is the case.</p>

Performance Indicator	Outstanding Issue (provide clear justification)	Certifier Response
	<p>It does not seem adequate to base an assessment of the effectiveness of the harvest strategy and harvest control rules on information that is now 7 years old, and which pre-dates the current period of certification.</p> <p>If the fishery is as well managed and documented as stated in the report, it should be easy to provide a more up-to-date time series of information, without which it is very hard to substantiate the score here.</p> <p>Again, I would urge the assessment team to revisit its scoring rationale and present some more up-to-date information to support the scoring of this PI.</p>	<p>The fact that the information presented pre-dates this assessment is not material here. Those data were presented purely to make the point that the available seed mussel in any year is often far below the total allocation.</p> <p>More up to date information on total allocations would be available but the usefulness of compiling it in this case does not justify the effort required. The point is already well made by the available data. The Assessment Team do not therefore feel it is necessary to revisit the rationale.</p>
2.1.1. Retained species outcome	<p>I raised concerns that it seemed very unlikely that the SG100 requirements were met, and also that there is a paucity of evidence in the report about catch composition to justify this very high score.</p> <p>I can still see insufficient numerical evidence to justify the score; and the team's response to PI 2.1.2 (see below) indicates that predator control is an integral part of the cultivation operation. It is hard to see how predator control in the cultivation process cannot be seen as the removal (and presumably either retention or discarding) of non-target species.</p> <p>Under these circumstances, the SG100 score still seems inappropriate. If the "predator control" removals are taken into account, then a score of 80 may be appropriate.</p>	<p>The Assessment Team have determined that there are no Main and no Minor Retained species and therefore the fishery does not impact the Retained species component. According to MSC CR v1.3 CB3.2.1, a default score of 100 is awarded for this PI.</p>
2.1.2. Retained species management	<p>In response to my comments about the catch of non-target species, it is argued that the catch is negligible to the point of satisfying the SG100 requirements.</p> <p>However in response to my concerns about potentially high catches of starfish and green crabs, the assessment team state that:-</p> <p><i>"Predator control is practiced in many ongrowing areas so the abundance of predatory species is likely less than the Peer Reviewer suspects. This predator control takes the form of fishing of green crabs and/or the 'mopping' of starfish."</i></p> <p>If this is the case, and if these activities are a fundamental part of the cultivation process, then why haven't the removals of green crabs and starfish been taken into account?</p>	<p>The removal of green crabs in some areas takes the form of a commercial pot fishery for green crabs; which is a separate fishery to the one under assessment.</p> <p>With respect to starfish, there is an element of cause-and-effect at play where starfish are only sometimes present in abundance in on-growing areas due to the presence of the mussels (i.e. if the mussels weren't there then the starfish wouldn't be either). In any case starfish are ubiquitous around Ireland and some localised 'mopping' of starfish is almost certainly not likely to have any impacts on starfish 'stocks'.</p>

Performance Indicator	Outstanding Issue (provide clear justification)	Certifier Response
	<p>Furthermore, what do we know about the methods used to control green crabs and starfish on mussel lays? Do they have an impact on other species as well? How are these activities managed?</p> <p>I feel that a review of the scoring for this PI is appropriate in this light of this new information about predator control on the mussel lays.</p>	<p>A previously mentioned the pot fishing of green crab is a separate fishery. The 'mopping' of starfish is highly unlikely to impact any other species.</p> <p>The information about predator control is not new and the Assessment were aware of it when originally scoring the fishery; therefore a review of the scoring is not required.</p>
2.2.1/2/3 – Bycatch species	My comments above apply to these PIs. If predator control is practised for green crabs and starfish, and if these species are discarded rather than retained, then this should really be considered under these PIs.	The Assessments team has responded to this concern above.

List any other issues you feel haven't been adequately addressed and would make a material difference to the scoring of the fishery.

Outstanding Issue	Certifier Response
<p>Units of Assessment / Certification</p> <p>The comments made on the Peer Review Draft Report highlighted that there are two species of <i>Mytilus</i> (<i>Mytilus edulis</i> and <i>M. galloprovincialis</i>) and also an interspecific hybrid within the UoA. These cannot be readily distinguished.</p> <p>My comments indicated that the assessment team should either have identified 3 UoAs (one for each species, and one for their hybrid) and / or that the fishery should have been assessed using the MSC's requirements for Indistinguishable or Practically Inseparable (IPI) stocks.</p> <p>The assessment team has responded to these comments by including a new section in the report which looks at the Population structure of mussel populations around the island of Ireland. This section is well referenced.</p> <p>However I am not at all convinced by the response to justify that there is just a single species in the UoC (when quite clearly from the new information presented in the report there is more than one species found in bottom-cultivated mussels).</p> <p>The key point here is that presently <i>M. galloprovincialis</i> has not been found in the Irish Sea. Whilst accepting that the mussel industry tends to harvest seed mussels in the Irish Sea (<i>M. edulis</i>) for export elsewhere, there seems to be nothing to prevent the mussel industry from harvesting <i>M. galloprovincialis</i> seed for on-growing in the Irish Sea.</p>	<p>No response required.</p> <p>No response required.</p> <p>No response required.</p> <p>The Assessment Team is confident on the balance of the available evidence that bottom grown mussels on the island of Ireland are <i>M. edulis</i>.</p> <p>This does not occur. The Peer Reviewer seems to be referring to a hypothetical situation. The key point is that the Assessment Team is confident that the fishery is highly unlikely to impact genetic structure of wild populations to a point where there would be serious or irreversible harm.</p>

Outstanding Issue	Certifier Response
<p>The assessment team is rather casual about this risk (see PI 1.1.4). The argument that the spread of <i>M. galloprovincialis</i> is inevitable is not a robust basis for inaction; as is the argument that the different <i>Mytilus</i> species and their hybrid role fulfil the same ecological role is also specious.</p> <p>The same arguments could equally be made of wild and cultivated salmon and trout in river systems, and would not be acceptable in that context; I am not sure that they are therefore acceptable here.</p> <p>Finally, the observation that rope-grown <i>M. galloprovincialis</i> exhibit high mortality when relayed on the seabed does not provide any conclusive evidence that this species is ill-suited to bottom culture. I am aware that trials elsewhere in Northern Europe show that the same is also true for rope-grown <i>M. edulis</i>.</p> <p>I feel that the report would be better aligned with MSC procedural requirements if the existence of two species and one interspecific hybrid was formally addressed either in the UoAs or through the IPI procedures.</p>	<p>Far from being 'casual' about the risk the Assessment Team have considered all the available evidence before drawing their conclusion. The fact that the relative distributions of the various <i>Mytilus</i> species will likely change in the coming years due to changing water temperatures is presented in order to place the potential risk by the fishery in context.</p> <p>The Assessment Team has no comment.</p> <p>This piece of information is not presented as conclusive evidence but rather a personal communication from BIM based on their (and industry observations) and is presented and referenced as such.</p> <p>The existence of two species and one interspecific hybrid has already been adequately addressed. The Assessment Team does not feel it necessary to address it further.</p>

8.3. Appendix 3. Client certificate sharing statement



Bord Iascaigh Mhara
An Cheannoifig
Bóthar Crofton,
Dún Laoghaire,
Co. Bhaile Átha Cliath
A96 E5A0

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Statement of BIM's Policy on Certificate Sharing Arrangements for the Ireland Bottom Grown Mussel Fishery.

BIM confirms its willingness to share the certificate for MSC certification of the Ireland Bottom Grown Mussel Fishery, including any further potential extension of the scope of that certificate.

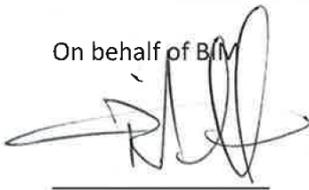
Mussels will be eligible for marketing with reference to the certificate, provided the mussels are supplied and/or sold by members of the client grouping and/or authenticated certificate sharers.

Any holders of Bottom Grown Mussel licenced sites and/or seed mussel allocations and /or processors and/or traders of this species derived from the above fishery are invited to apply to BIM for the sharing of the certificate.

Applicants will be eligible to enter into certificate sharing agreement with BIM on the basis of;

1. Reciprocal access to other certificates
2. Equitable sharing of internal and external costs incurred due to the assessment processes and
3. Full compliance with the MSC Fisheries Standards and Certification Requirements, including any conditions and recommendations set for the certification and any subsequent programs of corrective actions to address such conditions and recommendations

On behalf of BIM



Donal Maguire

8.4. Appendix 4. Stakeholder submissions

Note where submissions have been made by individual stakeholders, contact details have been redacted. In addition because of the linked nature of the Northern Ireland and Republic of Ireland Bottom Grown Mussel fisheries any stakeholder comments received for a particular fishery have been applied to both.

8.4.1. Ashley Hayden

Email 1:

 Mon 01/01/2018 15:23
Ashley Hayden <[REDACTED]@gmail.com>
RE: MSC Certification of the Irish Bottom Mussel Industry

To:  Samuel Dignan

 You replied to this message on 02/01/2018 10:25.

Dear Sam,

As I understand you are lead assessor for the MSC Certification of the Irish Bottom Mussel Industry team.

As a concerned stakeholder I strongly object to the award of this certification to the Irish Bottom Mussel Industry on the grounds of massive benthic habitat destruction the result of permanent mussel beds being dredged up for spat and the subsequent loss of biodiversity to include a coastal mixed fishery off North County Wicklow on Ireland's east coast which was in rude health prior to bottom mussel dredging for spat taking place.

As dredging for spat is a key element of the supply chain to market process of bottom sourced mussels - due to habitat destruction and subsequent loss of biodiversity in no way can this industry claim that its products are sustainable.

In fact the opportunity cost of lost artisan fishing and rod and line tourism related jobs alone resulting from habitat and biodiversity loss wreaked by bottom mussel dredging off North County Wicklow can be proved to offset by a large margin any gain from bottom mussel industry activities.

I am currently filling in an MSC stakeholder input form and have some questions re this as I want to make sure it is done correctly.

Also, I would like to meet and discuss with your team on site south of Greystones, Co. Wicklow if possible to explain why you are so obviously being misled with regard to how this fishery really conducts its business.

Yours sincerely,

Ashley Hayden BA MSc

Ph: [REDACTED]
Web: www.anirishanglersworld.com

Email 2:



Tue 02/01/2018 10:25

Samuel Dignan

RE: MSC Certification of the Irish Bottom Mussel Industry

To 'Ashley Hayden'

Dear Ashley,

Firstly, thank you for your response and comments which we will consider your comments in our assessment of the bottom grown mussel fishery. Unfortunately as you have not previously been identified as a stakeholder you would not have received the initial notifications for this assessment directly. I can also confirm that you have been added to our stakeholder list and in future will receive relevant notifications directly to the same email you used to contact us. If you have not done so already I would urge you to familiarise yourself with the role of stakeholders in MSC assessments; for more information on this please visit: <https://www.msc.org/track-a-fishery/have-your-say>.

Unfortunately at this point having completed the on-site portion of the site visit we have moved on to the evaluation of the fishery and are no longer in a position to meet with stakeholders. With that in mind, as we are already over a month after the site visit, if you would like us to consider any information you have at this stage of the process it would be good if you could get it to us this week or early next week. If comments are submitted later than this they will of course be accepted but may not be considered until the Public Comment Draft Report stage of the assessment process (mentioned below).

There will also be additional public comment opportunities later on once we have a draft report published. Going forward, as a registered stakeholder, you will receive relevant notifications directly. In addition documents relating to the assessment, including an indicative assessment timeline, are published on the MSC website: <https://fisheries.msc.org/en/fisheries/ireland-bottom-grown-mussel/@assessments>.

There are a couple of things I am required to advise you of so here goes. With respect to the submission of information, we encourage you not to withhold any information you feel is relevant. However, you should be aware that any information that you submit will be made public through the reporting process and under the MSC Fisheries Certification Requirements any information that is not made available to all stakeholders may not be used in determining the assessment outcome or as the basis for an objection to a certification. I'm sure this won't have any effect in your case but we are required to inform you regardless.

Many thanks once again for contacting us. Apologies for not being in a position to meet with you at this stage however, we look forward to working with you throughout this process and if you have any questions please don't hesitate to contact me.

Kind regards,

Sam Dignan

Fisheries Assessment Officer
SAI Global/Global Trust
Block 3, Quayside Business Park, Mill Street, Dundalk, County Louth, Ireland.
T: [+353 (0) 42 932 0912]
M: [+353 (0) 86 773 7955]
E: samuel.dignan@saiglobal.com

www.saiglobal.com

Email 3 (and attachment)



Tue 02/01/2018 12:10

Ashley Hayden <[REDACTED]@gmail.com>
Re: MSC Certification of the Irish Bottom Mussel Industry

To  Samuel Dignan

 You replied to this message on 03/01/2018 16:28.

 Message  MSC_template_for_stakeholder_input_in-fishery-assessments_v1.0.doc (1 MB)

Dear Sam thank you for replying.

I have filled in and attached my stakeholder fishery assessment form.

I hope that everything is in order.

Yours sincerely,

Ashley Hayden BA MSc

Ph: [REDACTED]
Web: www.anirishanglersworld.com

Attached MSC Stakeholder input form

Note while this is a verbatim version of the submitted form blank fields have been removed for clarity. In addition where the stakeholder included contact and/or personal details these have been redacted.

The Assessment Team have responded specifically to this submission immediately following the submission itself.

Template for Stakeholder Input into MSC Fishery Assessments

Contact Information Make sure you submit your full contact details at the first phase you participate in a specific assessment process, subsequent participation will only need your name unless these details have changed.					
Contact Name		<i>First</i>	Ashley	<i>Last</i>	Hayden
Title		Independent Stakeholder (Irish Citizen)			
On behalf of (organisation, company, government agency, etc.) – if applicable					
Organisation					
Department					
Position					
Description					
Mailing Address, Country		[REDACTED]			
Tel	+	Mob	[REDACTED]	Fax	+
Email	[REDACTED]			Web	www.anirishanglersworld.com

Assessment Details	
Fishery	Ireland Bottom Grown Mussel Fishery
Certification Body	MSC (Marine Stewardship Council) [note should be SAI Global]

• SECTION 1

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
Fishery announcement and stakeholder identification <i>Opportunity to indicate that you are a stakeholder and identify other stakeholders</i>	Ireland Bottom Grown Mussel Fishery - with specific reference to "spat/seed" collection sites on the east coast of Ireland off the north county Wicklow coastline.	01/01/2018	Ashley Hayden - Stakeholder (Irish Citizen)

Nature of Comment (select all that apply)		Additional Information/Detail Please attach additional pages if necessary.
<input checked="" type="checkbox"/>	I wish to indicate that I am a stakeholder in this fishery, please keep me informed about each stage of the assessment process	<p>My name is Ashley Hayden, I was born on [REDACTED] - my family background on both my father and mothers (nee Redmond) side hail from Greystones, Co. Wicklow - there is a family tradition of artisan small boat fishing (long lining, trammel netting) for both families that I can trace back to both my grandfathers. I was taught by my father and practiced long lining and trammel netting until the early 1980's - latterly I have practiced rod and line sea fishing for recreational purposes.</p> <p>I fished what were permanent mussel banks off Kilcoole, Co. Wicklow (Rileys Ridge) and Newcastle (The breaches shoal) from the 1970's into the mid 1980's.</p> <p>Today these permanent mussel banks do not exist as they were destroyed by bottom mussel dredging for spat/seed with a subsequent massive loss of fin fish and benthic species biodiversity the result of habitat destruction by the dredgers. What was once a marine aquarium now presents as a desert in comparison to what it was pre dredging.</p> <p>See links below to essays I have written and a species assessment based on the Irish Specimen Fish Committee Records between 1975 -2010.</p> <p>(1)http://www.anirishanglersworld.com/index.php/media/reviving-north-county-wicklows-inshore-fisheries-socio-economic-modal/</p> <p>(2)http://www.anirishanglersworld.com/index.php/marine-conservation/the-inshore-fishery-off-north-county-wicklow-from-an-angling-perspective-bray-head-to-wicklow-head-with-particular-reference-to-the-inshore-waters-off-greystones-updated-2010-08-24/</p>
<input checked="" type="checkbox"/>	I wish to suggest information or documents important for the assessment of this fishery (<i>you may either attach documents or provide references</i>)	
<input type="checkbox"/>	I wish to suggest other individuals or organizations who should be considered stakeholders in the MSC assessment of this fishery (<i>please name them with contact information</i>)	
<input type="checkbox"/>	Other (<i>please specify</i>)	

• SECTION 4

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
Information gathering and stakeholder meetings^{viii} <i>Opportunity to engage with and provide information to the certifier</i>	Ireland Bottom Grown Mussel Fishery - with specific reference to "spat/seed" collection sites on the east coast of Ireland off the north county Wicklow coastline.	01/01/2018	Ashley Hayden - Stakeholder (Irish Citizen)

Nature of Comment (select all that apply)		Additional Information/Detail Please attach additional pages if necessary.
<input checked="" type="checkbox"/>	I wish to request an in-person meeting with the assessment team during their assessment visit (meetings without the fishery client present may be requested at this phase of the process if needed)	There is very little written or peer reviewed information on this fishery other than word of mouth - permanent mussel banks in the area off north co. Wicklow underpinned a seasonal fin fishery for cod, plaice and a host of other species which provided local employment for small boat artisan fishers and rod and line tourism interests - all of which ended post 1980 when the dredging started and the permanent mussel banks were ripped up to be replaced by sand.
<input checked="" type="checkbox"/>	I wish to submit written information about the fishery and its performance against the FAM and/or RBF to the assessment team (please provide documents or references).	Any scientific papers that I have accessed which would appear to have been commissioned by BIM or completed by the agencies staff relating to "seed mussel" beds off the North County Wicklow coastline refer to transient mussel beds. That may be the case today but two and certainly three decades ago was not the case. I know from reading the BGMCF meeting reports that the industry still seeks out new seed beds as older exploited beds become uneconomic, i.e., fished out. This is the Achilles heel of the industry and why it should never have received initial certification in 2013.
<input checked="" type="checkbox"/>	Other (please specify)	

• SECTION 5

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
Public review of the draft assessment report^x <i>Opportunity to review and comment on the draft report, including the scoring of the fishery</i>	Ireland Bottom Grown Mussel Fishery - with specific reference to "spat/seed" collection sites on the east coast of Ireland off the north county Wicklow coastline.	01/01/2018	Ashley Hayden, Citizen Stakeholder

I wish to comment on the evaluation of the fishery against specific Performance Indicators. A table with these indicators and the scores and rationales provided by certifiers can be found as an appendix to the report.

Nature of comment (Please code below)

1. I do not believe all the relevant information^x available has been used to score this performance indicator (please provide details and rationale)
2. I do not think the information and/or rationale used to score this performance indicator is adequate to support the given score^{xi} (please provide details and rationale)
3. I do not believe the condition(s) set for this performance indicator are adequate to improve the fishery's performance to the SG80 level^{xii} (please provide details and rationale)
4. Other (please specify)

Performance Indicator	Nature of Comment	Justification
MSC Principal One. Sustainably target fish stocks.	A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.	Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. The inshore permanent mussel banks off Co. Wicklow on Ireland's east coast which were exploited by Irish Bottom Mussel vessels were destroyed and have never been allowed to recover.
MSC Principal Two. Environmental impact of fishing.	Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.	See above point. Seed collection is a key element within the supply chain of the bottom mussel to market process. The actual laying of mussel seed and collection from a specific area, for example Wexford harbour, is in my opinion quite benign environmentally, however it is how the seed is collected which is the problem and this needs to be taken into account re certification. In my opinion seed taken from the water column is the way this industry has to go before certification can be considered.

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
MSC Principal Three. Effective Management	The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.	<p>In effect at present the Irish Bottom Mussel Industry works within the law however its operational framework is not responsible or sustainable hence I am filling in this form.</p> <p>My rights nor the rights of many people as non recognised stakeholders who enjoyed or profited from activities which the once permanent mussel banks off North County Wicklow enabled have never been considered to date by either the state or the Irish Bottom Mussel Industry.</p> <p>Ownership of the Irish inshore mussel resource has always and still has a narrow definition.</p> <p>True responsibility and sustainability relative to the Irish inshore mussel resource will only occur when Government policy in conjunction with required legislation adopts habitat restoration of lost permanent mussel banks and requires the Bottom Mussel Industry to source its seed/spat ultimately from the water column as rope mussel operations do.</p>

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
<input checked="" type="checkbox"/> I wish to comment on the adequacy of the consultation process used to gather information about this fishery (for example, related to the RBF process, selection of stakeholders consulted, etc.)	Notice of the process relating to MSc Certification of the Irish Bottom Mussel Industry was not very visible.	I keep my ear to the ground on this subject and only found out today Monday 01/ 01/ 2018

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
<input checked="" type="checkbox"/> I wish to provide general comments about the assessment of this fishery against the MSC Principles and Criteria for Sustainable Fishing	<p>Dredging of spat for the Irish Bottom Mussel Industry is a key element of the supply chain to market.</p> <p>If an industry cannot meet the core principals of MSC certification then it cannot leave first base.</p> <p>The Irish Bottom Mussel Industry relies on dredged seed to sustain itself and it is this process which</p>	The dredging element of mussel spat within the supply chain to market for bottom mussels is key to the industry existing, however this dredging element has serious damaging repercussions for coastal benthic habitat and inshore fin fisheries - off north Co. Wicklow a once productive mixed fin fishery now no longer exists due to the removal of what was certainly up to the early 1980's permanent bottom mussel by dredgers which come from Wexford and the North of Ireland.

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
	<p>destroys habitat and subsequently fisheries which are attracted to that self same habitat.</p> <p>As a key element of the bottom mussel to market process certification has to recognise this damaging process and adjudicate accordingly.</p>	<p>MSC Principal One. Sustainably target fish stocks. - The inshore permanent mussel banks off Co. Wicklow on Ireland's east coast which were exploited by Irish Bottom Mussel vessels were destroyed and have never been allowed to recover.</p> <p>MSC Principal Two. Environmental impact of fishing - See above point. Seed collection is a key element within the supply chain of the bottom mussel to market process.</p> <p>The actual laying of mussel seed and collection from a specific area, for example Wexford harbour, is in my opinion quite benign environmentally, however it is how the seed is collected which is the problem and this needs to be taken into account re certification.</p> <p>In my opinion seed taken from the water column is the way this industry has to go before certification can be considered.</p> <p>MSC Principal Three. Effective Management - In effect at present the Irish Bottom Mussel Industry works within the law however its operational framework is not responsible or sustainable hence I am filling in this form.</p> <p>My rights nor the rights of many people as non recognised stakeholders who enjoyed or profited from activities which the once permanent mussel banks off North County Wicklow enabled have never been considered to date by either the state or the Irish Bottom Mussel Industry.</p> <p>Ownership of the Irish inshore mussel resource has always and still has a narrow definition.</p> <p>True responsibility and sustainability relative to the Irish inshore mussel resource will only occur when Government policy in conjunction with required legislation adopts habitat restoration of lost permanent mussel banks and requires the Bottom Mussel Industry to source its seed/spat ultimately from the water column as rope mussel operations do.</p>

• SECTION 6

Assessment Stage	Fishery	Date	Name of Commenter or Organisation
Announcement of surveillance visit^{xiii} <i>Opportunity to provide information to the certifier</i>	Ireland Bottom Grown Mussel Fishery - with specific reference to "spat/seed" collection sites on the east coast of Ireland off the north county Wicklow coastline.	01/01/2018	Ashley Hayden Citizen Stakeholder
Nature of Comment (select all that apply)		Justification Please attach additional pages if necessary.	
<input checked="" type="checkbox"/>	I wish to alert the assessment team to important changes in relation to the circumstances of this fishery relevant to the MSC assessment.	(1). http://www.anirishanglersworld.com/index.php/media/reviving-north-county-wicklows-inshore-fisheries-socio-economic-modal/	
<input checked="" type="checkbox"/>	I wish to provide information relevant to fulfilment of the conditions of certification.	(2.) http://www.anirishanglersworld.com/index.php/2016/02/analysis-of-specimen-sea-fish-records-for-co-wicklow-2010-2015/	
<input type="checkbox"/>	Other (<i>please specify</i>)	(3). http://www.anirishanglersworld.com/index.php/marine-conservation/the-inshore-fishery-off-north-county-wicklow-from-an-angling-perspective-bray-head-to-wicklow-head-with-particular-reference-to-the-inshore-waters-off-greystones-updated-2010-08-24/	
		(4). http://www.anirishanglersworld.com/index.php/media/an-anglers-tale/	

Assessment Team response to submission

Note in this section the Assessment responds in turn to each of the substantive points raised in the stakeholder's submission. Irrelevant sections of the submission (e.g. contact details) have been omitted for clarity.

• SECTION 1

Nature of Comment (select all that apply)	Additional Information/Detail Please attach additional pages if necessary.
<input checked="" type="checkbox"/>	I wish to indicate that I am a stakeholder in this fishery, please keep me informed about each stage of the assessment process
<input checked="" type="checkbox"/>	I wish to suggest information or documents important for the assessment of this fishery (<i>you may either attach documents or provide references</i>)
	My name is Ashley Hayden, I was born on [REDACTED] - my family background on both my father and mothers (nee Redmond) side hail from Greystones, Co. Wicklow - there is a family tradition of artisan small boat fishing (long lining, trammel netting) for both families that I can trace back to both my grandfathers. I was taught by my father and practiced long lining and trammel netting until the early 1980's - latterly I have practiced rod and line sea fishing for recreational purposes.
	I fished what were permanent mussel banks off Kilcoole, Co. Wicklow (Rileys Ridge) and Newcastle (The breaches shoal) from the 1970's into the mid 1980's.

<input type="checkbox"/>	I wish to suggest other individuals or organizations who should be considered stakeholders in the MSC assessment of this fishery <i>(please name them with contact information)</i>	Today these permanent mussel banks do not exist as they were destroyed by bottom mussel dredging for spat/seed with a subsequent massive loss of fin fish and benthic species biodiversity the result of habitat destruction by the dredgers. What was once a marine aquarium now presents as a desert in comparison to what it was pre dredging.
<input type="checkbox"/>	Other <i>(please specify)</i>	See links below to essays I have written and a species assessment based on the Irish Specimen Fish Committee Records between 1975 -2010. (1) http://www.anirishanglersworld.com/index.php/media/reviving-north-county-wicklows-inshore-fisheries-socio-economic-modal/ (2) http://www.anirishanglersworld.com/index.php/marine-conservation/the-inshore-fishery-off-north-county-wicklow-from-an-angling-perspective-bray-head-to-wicklow-head-with-particular-reference-to-the-inshore-waters-off-greystones-updated-2010-08-24/

Assessment Team response

At present the evidence available to the Assessment Team supports the assertion that the bottom grown mussel industry exploits ephemeral seed beds, in effect moving mussel seed form areas of high (i.e. total) natural mortality to areas where the seed can mature into marketable sized adults.

Although historically some beds may have been more stable than others and may have overwintered there are currently no known stable mature mussel beds in the area. BIM have been undertaking subtidal seed surveys in the Irish Sea since the 1970's and these historical surveys represent the best available source of scientific information on the nature and extent of seed beds in the Irish Sea. BIM have examined these records o assess the assertions that stable "overwintering" beds exist in this area. The data indicates that while seed beds do sometimes overwinter, no currently identified beds consistently overwinter and therefore no currently identified beds can be described as "permanent".

The absence of "permanent" beds is thought to be due to the highly energetic nature of the Irish Sea when compared with the location of stable beds elsewhere in Europe where they occur in much more sheltered locations, and the level of starfish predation. The "stock status" of seed mussels changes seasonally and is driven by recruitment and growth in spring and summer and mortality during winter.

Given the dynamic nature of the environment and the type of dredge used, repeated seed surveys of the Irish Sea has found that seed fishing leaves no permanent tracks on the areas fished. In addition repeated settlements on the same ground (see [Figure 2](#)) provide evidence of the fact that fishing activity does not prevent settlement of seed in the same area in subsequent years.

With all this being said, and given the fact that the true ephemerality of the seed mussel beds is continually raised as an issue of concern by stakeholders, the Assessment Team has recommended (see [Recommendation 1](#)) that the client group undertake a synthesis of all currently available evidence to support the assertion that the seed mussel beds exploited by the fishery are in fact ephemeral.

• SECTION 4

Nature of Comment (select all that apply)		Additional Information/Detail Please attach additional pages if necessary.
<input checked="" type="checkbox"/>	I wish to request an in-person meeting with the assessment team during their assessment visit (meetings without the fishery client present may be requested at this phase of the process if needed)	There is very little written or peer reviewed information on this fishery other than word of mouth - permanent mussel banks in the area off north co. Wicklow underpinned a seasonal fin fishery for cod, plaice and a host of other species which provided local employment for small boat artisan fishers and rod and line tourism interests - all of which ended post 1980 when the dredging started and the permanent mussel banks were ripped up to be replaced by sand.
<input checked="" type="checkbox"/>	I wish to submit written information about the fishery and its performance against the FAM and/or RBF to the assessment team (please provide documents or references).	Any scientific papers that I have accessed which would appear to have been commissioned by BIM or completed by the agencies staff relating to "seed mussel" beds off the North County Wicklow coastline refer to transient mussel beds. That may be the case today but two and certainly three decades ago was not the case. I know from reading the BGMCF meeting reports that the industry still seeks out new seed beds as older exploited beds become uneconomic, i.e., fished out. This is the Achilles heel of the industry and why it should never have received initial certification in 2013.
<input checked="" type="checkbox"/>	Other (please specify)	

Assessment Team response

As discussed above the evidence available supports the assertion that the industry exploits ephemeral seed mussel beds. In addition the decline of other fisheries in the southern Irish Sea (i.e. recreational finfish fisheries) could very well be related to over-exploitation in other fisheries, changes in migrations etc. and should not be exclusively attributed to the bottom mussel fishery.

The reason the industry continuously seeks out "new" beds is directly related to their ephemeral nature which means that the industry cannot continually return to the same seed mussel beds. Figure 2 shows that while beds do occur in the same general areas (due to local hydrodynamic regimes) their exact location varies such that they do represent the same bed.

• SECTION 5

Performance Indicator	Nature of Comment Indicate relevant code(s) from list above.	Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.
MSC Principal One. Sustainably target fish stocks.	A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.	The inshore permanent mussel banks off Co. Wicklow on Ireland's east coast which were exploited by Irish Bottom Mussel vessels were destroyed and have never been allowed to recover.
MSC Principal Two. Environmental impact of fishing.	Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.	<p>See above point. Seed collection is a key element within the supply chain of the bottom mussel to market process.</p> <p>The actual laying of mussel seed and collection from a specific area, for example Wexford harbour, is in my opinion quite benign environmentally, however it is how the seed is collected which is the problem and this needs to be taken into account re certification.</p> <p>In my opinion seed taken from the water column is the way this industry has to go before certification can be considered.</p>
MSC Principal Three. Effective Management	The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.	<p>In effect at present the Irish Bottom Mussel Industry works within the law however its operational framework is not responsible or sustainable hence I am filling in this form.</p> <p>My rights nor the rights of many people as non recognised stakeholders who enjoyed or profited from activities which the once permanent mussel banks off North County Wicklow enabled have never been considered to date by either the state or the Irish Bottom Mussel Industry.</p> <p>Ownership of the Irish inshore mussel resource has always and still has a narrow definition.</p> <p>True responsibility and sustainability relative to the Irish inshore mussel resource will only occur when Government policy in conjunction with required legislation adopts habitat restoration of lost permanent mussel banks and requires the Bottom Mussel Industry to source its seed/spat ultimately from the water column as rope mussel operations do.</p>

Assessment Team response

As discussed above the evidence available supports the assertion that the industry exploits ephemeral seed mussel beds. Unfortunately verifiable evidence supporting the historic presence of permanent sub-tidal mussel beds off Co. Wicklow, and of their being exploited to destruction by bottom mussel dredgers, is not currently available.

Seed mussel collection via dredging is an allowable activity under the MSC FCR v2.0 and therefore there is no requirement to use seed from spat collectors/hatchery seed. Findings in this report are consistent with those found elsewhere for other mussel fisheries that are MSC certified.

The Assessment Team have determined that, from a resource management point of view and according to the MSC's definition of sustainable (as outlined in the MSC FCR) the management framework operates effectively. Other aspects of sustainability (i.e. the potential socio-economic benefits that might be derived from allocating the resource differently, prioritisation of recreational over commercial fishing etc.) that might be part of what the stakeholder considers to be "true responsibility and sustainability" are not included in the MSC FCR v2.0 and as such have not been assessed here.

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
<input checked="" type="checkbox"/> I wish to comment on the adequacy of the consultation process used to gather information about this fishery (for example, related to the RBF process, selection of stakeholders consulted, etc.)	Notice of the process relating to MSc Certification of the Irish Bottom Mussel Industry was not very visible.	I keep my ear to the ground on this subject and only found out today Monday 01/ 01/ 2018

Assessment Team response

All announcements relating to the re-assessment of this fishery are publically available online. In addition previously identified stakeholders were contacted directly. Once registered stakeholders will continue to receive direct notifications of development with respect to this fishery until such time as they advise SAI Global that they no longer wish this to be the case.

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
<input checked="" type="checkbox"/> I wish to provide general comments about the assessment of this fishery against the MSC Principles and Criteria for Sustainable Fishing	<p>Dredging of spat for the Irish Bottom Mussel Industry is a key element of the supply chain to market.</p> <p>If an industry cannot meet the core principals of MSC certification then it cannot leave first base.</p> <p>The Irish Bottom Mussel Industry relies on dredged seed to sustain itself and it is this process which destroys habitat and subsequently fisheries which are attracted to that self same habitat.</p>	<p>The dredging element of mussel spat within the supply chain to market for bottom mussels is key to the industry existing, however this dredging element has serious damaging repercussions for coastal benthic habitat and inshore fin fisheries - off north Co. Wicklow a once productive mixed fin fishery now no longer exists due to the removal of what was certainly up to the early 1980's permanent bottom mussel by dredgers which come from Wexford and the North of Ireland.</p> <p>MSC Principal One. Sustainably target fish stocks. - The inshore permanent mussel banks off Co. Wicklow on Ireland's east coast which were exploited by Irish Bottom Mussel vessels</p>

Comment	Nature of Comment	Justification Please attach additional pages if necessary.
	<p>As a key element of the bottom mussel to market process certification has to recognise this damaging process and adjudicate accordingly.</p>	<p>were destroyed and have never been allowed to recover.</p> <p>MSC Principal Two. Environmental impact of fishing - See above point. Seed collection is a key element within the supply chain of the bottom mussel to market process.</p> <p>The actual laying of mussel seed and collection from a specific area, for example Wexford harbour, is in my opinion quite benign environmentally, however it is how the seed is collected which is the problem and this needs to be taken into account re certification.</p> <p>In my opinion seed taken from the water column is the way this industry has to go before certification can be considered.</p> <p>MSC Principal Three. Effective Management - In effect at present the Irish Bottom Mussel Industry works within the law however its operational framework is not responsible or sustainable hence I am filling in this form.</p> <p>My rights nor the rights of many people as non recognised stakeholders who enjoyed or profited from activities which the once permanent mussel banks off North County Wicklow enabled have never been considered to date by either the state or the Irish Bottom Mussel Industry.</p> <p>Ownership of the Irish inshore mussel resource has always and still has a narrow definition.</p> <p>True responsibility and sustainability relative to the Irish inshore mussel resource will only occur when Government policy in conjunction with required legislation adopts habitat restoration of lost permanent mussel banks and requires the Bottom Mussel Industry to source its seed/spat ultimately from the water column as rope mussel operations do.</p>

Assessment Team response

This part of the submission is a repeat of the previous section. As such the points raised here have been responded to above.

Email 4:



Wed 03/01/2018 16:28

Samuel Dignan

RE: MSC Certification of the Irish Bottom Mussel Industry

To 'Ashley Hayden'

Hi Ashley,

Thank you for your comments, having quickly skimmed through them they look very constructive so thank you very much for that. The Assessment Team will now consider your submission in our assessment of the fishery and we are required to include your submission along with our responses in future assessment reports. So basically we will put your submission verbatim into the report.

A draft report for public comment will likely be available in Feb/March but we will inform you directly once this becomes available. At this point you will have a 30 day period in which you can provide further comments as to the recommended outcome of the assessment process.

Many thanks once again for your input and if you have any questions please don't hesitate to contact me.

Cheers,

Sam

Email 5:



Wed 31/01/2018 17:53

Ashley Hayden <[REDACTED]@gmail.com>

Irish Bottom Mussel Industry Certification

To Samuel Dignan

i You replied to this message on 01/02/2018 10:55.

Dear Sam,

I have just read your report on MSC re-certification of the Irish Bottom Mussel Industry.

It amazes me based on the evidence that I tendered with regard to the untold damage to permanent mussel banks off north County Wicklow that SAI Global would recommend continuance of MSC certification.

"The Ireland Grown Bottom Mussel fishery (and the linked Northern Ireland Bottom Grown Mussel fishery) continue to operate well-managed and sustainable fisheries and therefore, continued certification to the MSC Principles and Criteria for Sustainable Fishing is awarded."

Please give me a call on [REDACTED] to explain how habitat destruction of permanent mussel sites can be deemed sustainable. In my opinion this decision makes a mockery of what the MSC purports to stand for.

Yours sincerely,

Ashley Hayden

Ph: [REDACTED]

Email 6:



Thu 01/02/2018 10:55

Samuel Dignan

RE: Irish Bottom Mussel Industry Certification

To 'Ashley Hayden'

Dear Ashley,

Apologies for missing your calls. I'll give you a ring shortly. I just wanted to send some info on first beforehand.

You're probably aware of this but the report that went up on Monday was a surveillance report for the fishery, this relates to the current certificate and not the re-assessment of the fishery which is ongoing. Given the point at which comments were submitted it is in the re-assessment reports that your comments will be included and specifically responded to. FYI a public comment draft of the re-assessment report, including your submission and our specific responses, should be up in late-Feb/early-March depending on when we can get it through Peer Review.

I think it might also be helpful if I clarified our (SAI Global's) role in the MSC process.

SAI Global is an independent third party Certification Body whose role it is to assess applicant fisheries (in this instance the mussel fishery) against MSC requirements. Our application of the MSC Requirements must follow a set of defined processes and our work is subject to rigorous review through MSC's internal technical oversight mechanisms and regular audits by MSC's accreditation body ASI. So basically what this means is that we have no role in developing the requirements with our role being limited to assessing the fishery against set criteria using set processes with our work then being subject to scrutiny from peer reviewers (for full assessment reports), stakeholders, MSC and ASI.

Specifically when it comes to habitat impacts the fishery is deemed (based on the available evidence) to be: *"highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm."* Importantly habitat impacts here are considered on a regional or bioregional basis so a fishery can cause localized impacts and still mean the requirements. In the case of the mussel fishery available evidence supports the assertion that the fishery is spatially and temporally extremely limited and is confined to what are considered to be ephemeral seed mussel beds in highly dynamic areas. I think this is the area you are particularly in disagreement with (i.e. the idea that these seed beds are ephemeral)?

Note the *"highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm"* and the *"considered on a regional or bioregional basis"* are not our words and are taken straight out of the MSC Requirements and this finding is consistent with those found elsewhere for other mussel fisheries that are MSC certified.

Anyway I will give you a call shortly to discuss.

Kind regards,

Sam Dignan

Fisheries Assessment Officer

SAI Global/Global Trust

Block 3, Quayside Business Park, Mill Street, Dundalk, County Louth, Ireland.

T: [+353 (0) 42 932 0912]

M: [+353 (0) 86 773 7955]

E: samuel.dignan@saiglobal.com

www.saiglobal.com

8.4.2. Charles Hendron

Email 1:

 Wed 03/01/2018 15:58

charles hendron <[REDACTED]@hotmail.com>
mussel spat dredging

To  Samuel Dignan

 You replied to this message on 03/01/2018 16:20.

Hi Sam

Can you please instruct me on how to obtain the template for the 'Stakeholder Input into MSC Fishery Assessment please'? Have you got a link?
I wish to state my concerns against dredging for spat and make clear my objection to its certification.

Thank you

Charles

Email 2:

Wed 03/01/2018 16:21

Samuel Dignan

RE: mussel spat dredgingTo 'charles hendron'; 'Kieran Hanrahan'

Hi Charles and Kieran,

I hope you guys don't mind but since you both had the exact same request I'm going to reply to you both in this email.

Firstly, neither of you have previously been identified as a stakeholder so you would not have received the initial notifications for this assessment directly. I can confirm that I have now added you added to our stakeholder list so in future you will receive relevant notifications directly to the same email you used to contact us.

Thank you for getting in touch. I'll give up a quick rundown on the process for submitting comments relating to the ongoing re-assessment of the Irish bottom grown mussel fishery. If you have not done so already I would urge you to familiarise yourself with the role of stakeholders in MSC assessments; for more information on this please visit: <https://www.msc.org/track-a-fishery/have-your-say>.

With regards to the template for stakeholder comment you can find that here: <https://www.msc.org/track-a-fishery/have-your-say/comment-on-an-assessment/comment-on-an-assessment>. There is a link for download about halfway down the page in the "How to Comment" section. If you find that template difficult to use you can just submit in letter form. The most important thing is that you should be aware that in order for comments to be as impactful as possible, the details provided are crucial. We can only consider information that is relevant, factual and substantiated (backed up by clear evidence).

As we are already over a month after the site visit, if you would like us to consider any information you have at this stage of the process it would be good if you could get it to us this week or early next week. If comments are submitted later than this they will of course be accepted but may not be considered until the Public Comment Draft Report stage of the assessment process (mentioned below).

There will also be additional public comment opportunities later on once we have a draft report published. Going forward, as a registered stakeholder, you will receive relevant notifications directly. In addition documents relating to the assessment, including an indicative assessment timeline, are published on the MSC website: <https://fisheries.msc.org/en/fisheries/ireland-bottom-grown-mussel/@@assessments>.

Just a bit of required housekeeping, I have to inform you that with respect to the submission of information, we encourage you not to withhold any information you feel is relevant. However, you should be aware that any information that you submit will be made public through the reporting process and under the MSC Fisheries Certification Requirements any information that is not made available to all stakeholders may not be used in determining the assessment outcome or as the basis for an objection to a certification. I'm sure this won't have any effect in your case but we are required to inform you regardless.

Many thanks once again for contacting us. We look forward to working with you both throughout this process and if you have any questions please don't hesitate to contact me.

Cheers,

Sam Dignan

Fisheries Assessment Officer
SAI Global/Global Trust

Email 3:

 Fri 05/01/2018 16:37
charles hendron <[REDACTED]@hotmail.com>
Re: mussel spat dredging

To  Samuel Dignan

 If there are problems with how this message is displayed, click here to view it in a web browser.

Hi Sam

that's great, thank you for an informative an hasty reply.

Yes, I can't imagine that I will have been identified as a stakeholder already, in this case or any cases previous, as it is the first time that I have taken any steps to try to put forward my opinions.

So, basically, I am a very keen recreational angler and naturally concerned at the present state, and future well-being, of our marine resource; I have an issue with bottom trawling in general and particularly with any sort of dredging activity..

I appreciate you adding me to the stakeholder list, thank you, as I certainly see myself as a stakeholder.
But are recreational anglers directly considered as stakeholders, in relation to having an 'interest' in a fishery being considered for certification?
Any option or comment that i may present will be based on observational experience and any gathered general knowledge, not necessarily "**factual and substantiated (backed up by clear evidence)**" comments.
How indeed are recreational anglers 'viewed' under such circumstances?

Thanks again Sam

Kind regards
Charles

Email 4:

 Fri 26/01/2018 01:05
charles hendron <[REDACTED]@hotmail.com>
Re: mussel spat dredging

To  Samuel Dignan

 If there are problems with how this message is displayed, click here to view it in a web browser.

Hi Sam

Having read your response below and having gone through all the information as supplied on the MSC website as best I could, I now realise that it is all associated with 'having your say' with the actual fishery *assessment* process only. Am I correct?

However, I don't wish to get involved with the fishery assessment process itself (give input or provide opinion on how it is conducted etc) but instead wish to raise my concerns about the ecological impact of mussel dredging on our marine environment, in general.

I don't believe there was anywhere to do this on the MSC website (?) and so what I really want to know is: who do I address my concerns to directly such that they will be taken seriously when the certification is considered?? Is there someone in the MSC that I should be addressing instead?

I hope that I am understanding everything correctly here. I hope that I am approaching this from the correct direction.

Thanks again

Charles

Email 5:

 Mon 29/01/2018 15:58
charles hendron <[REDACTED]@hotmail.com>
Fw: mussel spat dredging

To  Samuel Dignan

 You replied to this message on 29/01/2018 16:40.
If there are problems with how this message is displayed, click here to view it in a web browser.

Hi Sam

Did you get the chance to read my email below?
So would I be channelling my concerns in the proper direction (i.e. via you)? If I'm not, then can you please give me an idea of who I should be channelling them through?

Thanks
Charles

Email 6:

 Mon 29/01/2018 16:41
Samuel Dignan
RE: mussel spat dredging

To 'charles hendron'
Cc Géraldine Criquet

Hi Charles,

Apologies for not getting back to you sooner. In answer to your question yes you are correct everything I would have alluded to has to do with getting involved in the assessment process specifically. But remember as part of this process the impacts of mussel dredging is considered so any submission with respect to the ecological impact of mussel dredging on our marine environment will be considered, will be included in full in the report and will be responded to directly; these are all things that we are required to do as part of the process.

I suppose it would be helpful if I clarified our role in the MSC process. SAI Global is an independent third party Certification Accreditation Body (CAB) whose role it is to assess applicant fisheries against requirements laid out in the MSC Fisheries Certification Requirements (FCR). SAI Global's application of the MSC FCR and adherence to defined processes is subject to rigorous review through MSC's internal technical oversight mechanisms and regular audits by MSC's accreditation body ASI. With this in mind, any decisions made by SAI Global's Assessment Team are defined purely by the MSC FCR v2.0 and other relevant scheme documents. So basically our role is to assess a fishery against set criteria (the MSC FCR) using set processes.

If you don't wish to get involved with the fishery assessment process itself but are instead concerned about the ecological impact of mussel dredging more generally and the fact that the MSC FCR allows this kind of fishing you would have to channel your concerns through MSC directly **BUT** doing it this way will limit any impact your submission will have on any future certification decisions. If you still want to go that route there's a contact form on their website here: <https://www.msc.org/about-us/offices-staff/email-us> and I suppose the idea is they will contact you.

I would say that as we are the ones conducting the assessment so if you want your submission to have an influence over an eventual certification decision you do need to submit it through us. A submission to MSC might be considered with respect to the future development of their requirements but I'm not 100% on how they do things so couldn't guarantee that it would. If you are finding the stakeholder template too cumbersome and would like to make a submission in another form.

p.s. You should get an email today about a surveillance report for the fishery, this relates to the current certificate and not the re-assessment of the fishery which is ongoing. If you didn't get the email it means I didn't add you to the list correctly so please let me know if that's the case.

I hope this helps,

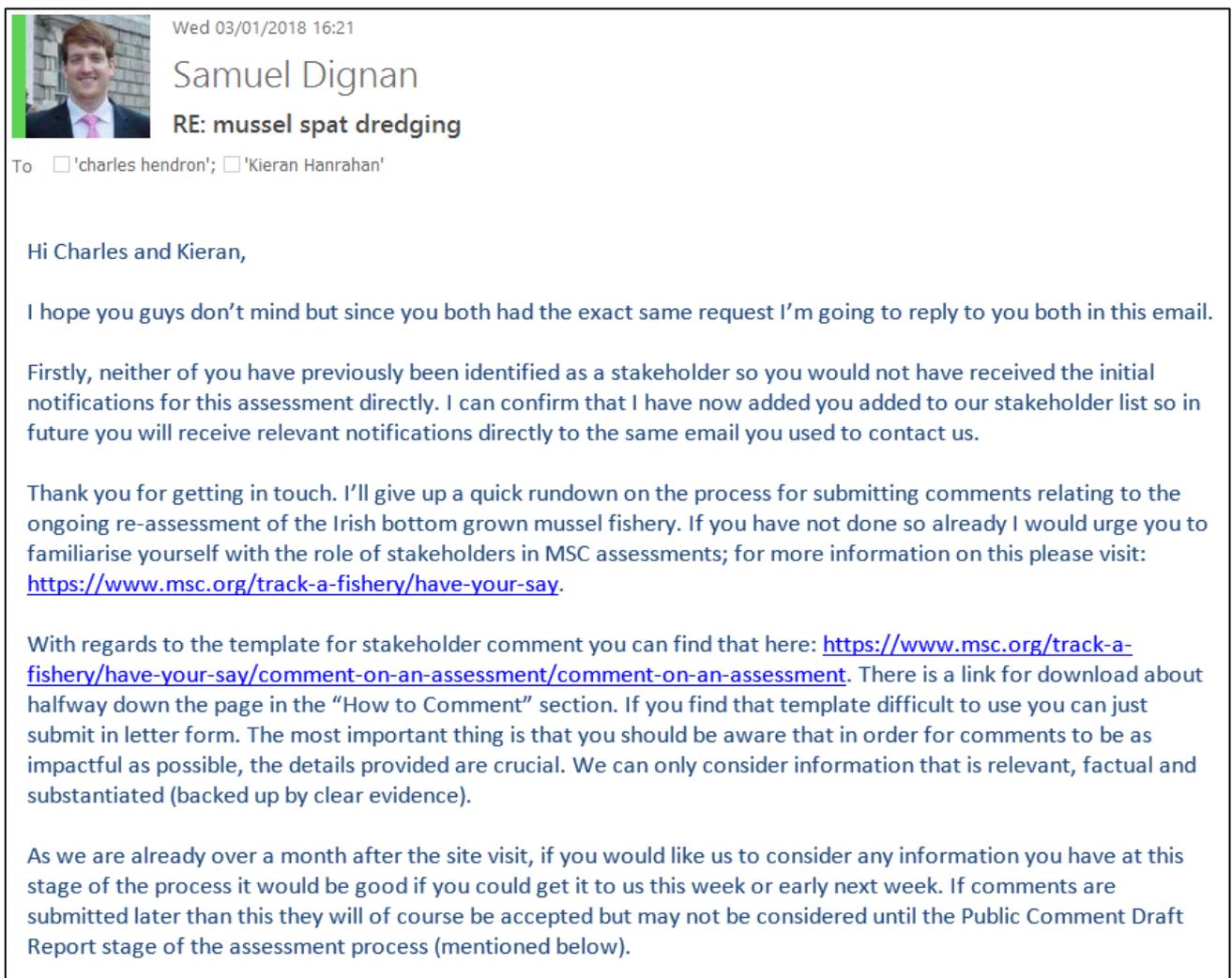
Sam

8.4.3. Kieran Hanrahan

Email 1:



Email 2:



There will also be additional public comment opportunities later on once we have a draft report published. Going forward, as a registered stakeholder, you will receive relevant notifications directly. In addition documents relating to the assessment, including an indicative assessment timeline, are published on the MSC website:

<https://fisheries.msc.org/en/fisheries/ireland-bottom-grown-mussel/@assessments>.

Just a bit of required housekeeping, I have to inform you that with respect to the submission of information, we encourage you not to withhold any information you feel is relevant. However, you should be aware that any information that you submit will be made public through the reporting process and under the MSC Fisheries Certification Requirements any information that is not made available to all stakeholders may not be used in determining the assessment outcome or as the basis for an objection to a certification. I'm sure this won't have any effect in your case but we are required to inform you regardless.

Many thanks once again for contacting us. We look forward to working with you both throughout this process and if you have any questions please don't hesitate to contact me.

Cheers,

Sam Dignan

Fisheries Assessment Officer
SAI Global/Global Trust

Email 3:



Thu 04/01/2018 20:29

Kieran Hanrahan <[REDACTED]@gmail.com>

Re: mussel spat dredging

To  Samuel Dignan

thank Sean, very clear!

Kieran

8.4.4. Northern Ireland Marine Task Force

Email 1:

From: james@nimtf.org [<mailto:james@nimtf.org>]

Sent: 26 October 2017 16:46

To: Ruth O'Connell

Subject: Stakeholder registration documents for the NI bottom grown mussel fishery

Hey Ruth,

I am working through the 'MSC template for stakeholder input in fishery assessments' with a view to registering as a stakeholder in the NI bottom grown mussel fishery reassessment. I am having difficulty commenting on the 'FAM assessment tree' as I am unsure where I can access information on this. Would you be able to point me in the right direction?

Thanks,

James Rainey

Northern Ireland Marine Task Force

Direct Line: 028 9046 3127

Address: McClelland House, 10 Heron Road, Belfast, BT3 9LE. Tel: 028 9045 4094

www.nimtf.org @NIMTF #SeaChangeNI

Email 2:

Hi James,

Ruth forwarded your query on to me as I'm leading the Assessment Team for this fishery. Firstly, I can confirm that you have been added to our list of stakeholders and will receive any future notifications related to the fishery directly.

The section of the "Template for Stakeholder Input into MSC Fishery Assessments" to which you refer is only really to be used if a modified tree is to be used in the assessment.

For this re-assessment we will be using the default enhanced bivalve tree for catch and grow fisheries (MSC CR v1.3). As the fishery involves the translocation of seed from one area to another we will also have to score Principle 1 be scored. This tree is mostly the same as for a normal fishery but as this fishery involves catching seed and laying it out elsewhere to on-grow it represents a Catch and Grow fishery for the purpose of assessment and this means a few extra areas around the genetic impacts of translocation need to be scored.

If you're interested you can find the additional parts of the Assessment Tree we will be using in "Annex CK: Modifications to the Default Tree for Enhanced Bivalve Fisheries" on page 342 of the MSC CR version 1.3 which you can find here: <https://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents> under Fisheries Certification Requirements and Guidance.

If you've any questions please get back to me.

Cheers,

Sam Dignan

Fisheries Assessment Officer

SAI Global/Global Trust

Email 3:

Subject:Re: Stakeholder registration documents for the NI bottom grown mussel fishery
Date:2017-10-27 10:00
From:james@nimtf.org
To:Samuel Dignan <Samuel.Dignan@saiglobal.com>

Hey Sam,

Thanks for your reply.

We would see our role as a stakeholder being to ensure that the following are taken into consideration:

- appropriate sensitivity assessments of subtidal blue mussel bed habitat
- within NI waters, subtidal blue mussel beds are recognised as component habitats for the potential Marine Conservation Zone features: 'sublittoral biogenic reefs', 'sublittoral muds', and 'sublittoral sand'

Is there a specific stage of the assessment where we would provide evidence on these points?

Many thanks,

James

Email 4:

From: james@nimtf.org [<mailto:james@nimtf.org>]
Sent: 17 November 2017 14:43
To: Donna Sweeney <Donna.Sweeney@saiglobal.com>
Subject: Fwd: Re: Stakeholder registration documents for the NI bottom grown mussel fishery

Hey Donna,

Further to our phone conversation, I was just wondering if the workshop on the 27th is appropriate place to raise the points in the message below.

Many thanks,

James

Northern Ireland Marine Task Force

Direct Line: 028 9046 3127

Address: McClelland House, 10 Heron Road, Belfast, BT3 9LE. Tel: 028 9045 4094

www.nimtf.org @NIMTF #SeaChangeNI

Email 5:

Hi James,

I had Donna send out an email on this earlier but I don't think you were on the list. We've added you now so going forward you should get relevant emails directly to: james@nimtf.org. The gist of the email is this.

If you wish to meet with the Assessment Team, we will be Dún Laoghaire and available to meet with stakeholders on Wednesday 29th November and again on the morning/early-afternoon of Friday 1st December 2017. If either of those dates/times works for you please let us know by close of business on Wednesday 22nd November and we will set it up.

If you cannot make a meeting but would still like to contribute you can do so by submitting written comments. You can use the form but if you are finding that cumbersome feel free to just make a submission in whatever format you feel works for your info.

There's no reason you can't do both. That's what a lot of people do because if you make a submission we are required to include it and our responses to the points raised into the assessment report.

Just a bit of housekeeping here, and I'm sure it won't apply to your organisation, I'm required to inform you that we encourage you not to withhold any information you feel is relevant. However, you should be aware that any information that you submit will be made public through the reporting process. Any information that is not made available to all stakeholders may not be used in determining assessment outcomes or as the basis for an objection to a certification.

If you could let me know what suits that would be great and any questions please don't hesitate to ask.

Cheers,

Sam Dignan

Fisheries Assessment Officer

SAI Global/Global Trust

Email 6:

Subject:Re: Stakeholder registration documents for the NI bottom grown mussel fishery

Date:2017-11-22 10:21

From:james@nimtf.org

To:Samuel Dignan <Samuel.Dignan@saiglobal.com>

Hey Sam,

Thanks for clarifying- we'll not be able to make either of the stakeholder meetings, but will make a written submission. When are these required by?

Many thanks,

James

Email 7:

 Tue 02/01/2018 16:08
james@nimtf.org
Fwd: Re: Stakeholder registration documents for the NI bottom grown mussel fishery

To  Samuel Dignan

 You replied to this message on 03/01/2018 16:32.

Hey Sam,

Please see our submission below:

"NIMTF wishes the following points to be taken into account during the MSC assessment of the NI bottom grown mussel fishery:

- Subtidal blue mussel beds have a medium sensitivity to abrasive, penetrative and extractive pressures¹.
- Within Northern Ireland, subtidal blue mussel beds are a component habitat of several potential Marine Conservation Zone habitats. These include sublittoral biogenic reefs, sublittoral muds and sublittoral sand².

1. Tillin, H.M. & Mainwaring, K., 2016. [Mytilus edulis] beds on sublittoral sediment. In Tyler-Walters H. and Hiscock K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 14-12-2017]. Available from: <http://www.marlin.ac.uk/habitat/detail/36>
2. DOE 2014. Guidance on selection and designation of Marine Conservation Zones (MCZs) in the Northern Ireland Inshore Region"

Best wishes,

James

Email 8:

 Wed 03/01/2018 16:32
Samuel Dignan
RE: Re: Stakeholder registration documents for the NI bottom grown mussel fishery

To 'james@nimtf.org'

Hi James,

Thank you for your comments. The Assessment Team will now take your submission into account in our assessment of the fishery and we are required to include your submission along with our responses in future assessment reports. So basically we will put your submission verbatim into the report.

A draft report for public comment will likely be available in Feb/March but we will inform you directly once this becomes available. At this point you will have a 30 day period in which you can provide further comments as to the recommended outcome of the assessment process.

Many thanks once again for your input and if you have any questions please don't hesitate to contact me.

Cheers,

Sam

8.5. Appendix 5. MSC Technical Oversight

The MSC provided technical oversight on 25th May 2018 via its Supply Chain Standards Team. Technical Oversight is provided for action by the CAB (SAI Global) and ASI (MSC's Accreditation Body) in order to improve consistency with the MSC scheme requirements; MSC does not review all work products submitted by Conformity Assessment Bodies and Technical Oversight does not represent a checking service. The TO comments are presented below (note TO has been re-formatted for presentation purposes only). The Re-assessment team has adjusted the content of the report to reflect all clarifications and suggestions and has responded specifically to each TO below.

MSC Technical Oversight (TO)

Ref	Type	Requirement	Oversight Description	Assessment Team Response
28804	Guidance	FCR 7.4.11.c v2.0	Conflicting statements exist within the report stating that 'there are currently no other eligible fishers' and conversely that 'there are other eligible fishers who are not members of the client group and who fish for the target species using the same fishing gear under the same management system(s)' (p.14). Please clarify what the current situation is and if other eligible fishers exist outside the client group please identify and elaborate the risk this poses to traceability as per FCR 7.4.11.c	The UoA table should have read there are currently other eligible fishers; this has been corrected. The current situation is that all bottom grown mussels on-grown in Rol waters are potentially eligible for Certification if they are sold through a member of the Client Group. The Client Group membership is fluid and is determined based on whether a member has paid their dues in a given year. An updated Client Group member list will be maintained on the MSC website.
28805	Guidance	FCR 7.12.1.1 v2.0	The report states: 'The system for recording the transfer of product to buyers is sufficient to identify that all product is eligible for MSC CoC'. Please further detail how the system meets the MSC requirements.	All mussels within the UoA fished by certified gears are potentially eligible for certification upon sale to a member of the client group. Product does not become eligible until it enters the Client Group and once it does all bottom grown mussels held by a member of the Client Group are eligible. Therefore bottom mussels held by a member of the Client Group are eligible to enter further Chains of Custody.
28806	Guidance	FCR 7.12.1.5.b v2.0	Please confirm the point of intended change of ownership of the product. Also please clarify if the point of first sale is taking place at the point of landing. As the assessment has only scrutinized up to the point of landing, please evaluate the traceability risks of all activities between point of landing and first sale, if any.	The Client Group is made up of both vessels and processors. Therefore, CoC will be required where the product leaves the Client Group for the first time. The point of first sale may or may not take place at landing depending on whether the product is being landed to an eligible processor by an eligible vessel that is also owned by that processor. As pointed out in the UoA table all bottom grown mussels on-grown in Rol waters are potentially eligible for Certification if they are sold through a member of the Client Group. Therefore, traceability risks between point of landing and first sale, where they differ, are mitigated by the fact that all product is potentially eligible.

8.6. Appendix 6. Surveillance Frequency

During each full assessment, surveillance and re-certification assessment, the team, with input from the client shall determine the level at which subsequent surveillance of the fishery shall be undertaken. Surveillance audits shall take place according to the default surveillance level (requiring 4 on-site surveillance audits), unless the team decides on a reduced surveillance programme.

The surveillance level for the fishery shall be determined on the basis of the confidence of the CAB in its ability to verify information, and progress towards meeting conditions, remotely and surveillance level 1 may only be chosen if, following an assessment or surveillance audit, the fishery has no outstanding conditions. Where a reduced surveillance level is adopted rationale is required as to how the CAB can verify information remotely.

To assess fisheries against the verification of information criteria the Assessment Team elected to use Table G13 provided in the FCR v2.0 to determine the likelihood that future surveillance teams will be able to access the required information remotely and that they can confirm veracity of the information. For results of this assessment of the fishery against the verification of information criteria see Table 30 below.

Table 30. Assessment of the Northern Ireland Bottom Grown Mussel fishery against verification of information criteria.

	Ability to verify remotely is low	Ability to verify remotely is high	SAI Global evaluation
Client and stakeholder input	Electronic forms of communication and other mechanisms to engage with clients and stakeholders (such as video conferencing, phone conferencing, email, phone) are absent, limited or inefficient and ineffective in providing the information required for an audit in the particular circumstances of the fishery.	There are ample opportunities and mechanisms to engage with clients and stakeholders including electronic forms of communication, such as videoconferencing phone conferencing, email, phone. The mechanisms are effective in the particular circumstances of the fishery.	Electronic forms of communication are widely and readily available. SAI Global's ability to remotely verify information is determined to be High .
Fishery reports, government documents, stock assessment reports and/or other relevant reports	Fishery reports and other types of reports required for the surveillance, and to demonstrate fishery performance in relation to any relevant conditions and on-going performance against the MSC's standard are not available publicly and cannot be transmitted electronically. There is no remote access to the information and there are none, or very limited other sources available to triangulate and confirm status of the fishery with respect to the MSC standard	Fishery reports and other documented evidence that can be used to demonstrate progress against conditions and other issue relevant to the MSC Principles and criteria can be easily and transparently checked remotely, due to such information being available publicly, such as being available on a website or having been widely distributed and made publically available to several stakeholders. The reports can be transmitted electronically and veracity easily confirmed.	Documentation relating to fisheries advice, research and management are available online or can be obtained electronically. SAI Global's ability to remotely verify information is determined to be High .
Information appropriate to determination of Principle 1 and 2 information requirements.	Information from electronic monitoring of position, observer data, logbooks, fisher interviews, dockside monitoring etc. is required for audits but cannot be easily transmitted to a remote auditor in a form that can be easily interpreted.	Where Information from electronic monitoring of position, observer data, logbooks, fisher interviews, dockside monitoring etc. is required to verify performance against MSC standard, this information is available to be transmitted electronically to auditors in a form that can be easily interpreted.	Data on landings is available to be transmitted electronically. Any other information that might be required can be transmitted in an electronic form. SAI Global's ability to remotely verify information is determined to be High .

Transparency of the management system	Level of transparency of information by management is low such that information about performance of the fishery is generally not easily and widely available.	There is a high level of transparency in management, such that information on the fishery is widely and publically available or known to the wider group of stakeholders. Any information provided on the fishery can be easily verified.	Information on the fishery is transparent, widely available online. Information can easily be verified by checking online sources or through direct contact with relevant officials. SAI Global's ability to remotely verify information is determined to be High .
Vessels, gear or other physical aspect of the fishery	There are milestones and conditions that require inspection of vessels or other physical aspects of the fishery during the audit and there are no reliable mechanisms for verifying these aspects of the fishery from a remote location.	There are no milestones that require investigation of physical aspects of the fishery or if there are, there are reliable mechanisms to enable verification of developments with respect to that milestone from a remote location.	There are no Conditions and hence no milestones that not require investigation of physical aspects of the fishery. SAI Global's ability to remotely verify information is determined to be High .

Following this assessment it was determined that the appropriate surveillance level for this fishery at this time is Surveillance Level 1 (minimum surveillance) (Note this Surveillance Level may be revised at subsequent surveillance audits should the rationale presented here no longer hold true). The fishery is eligible for Surveillance Level 1, as there are no outstanding conditions.

Rationale for a reduction from the default surveillance level are presented in Table 31 below.

Rationale for any deviations from carrying out the surveillance audit before or after the anniversary date of certification are presented in Table 32 below.

A completed fishery surveillance program is presented in Table 33 below.

Table 31. Surveillance level rationale.

Year	Surveillance activity	Number of auditors	Rationale
Year 1 (2019)	Review of information audit	2 remote auditors*	There are no Conditions and any required information can be provided remotely; therefore, SAI Global proposes to conduct a review of information audit.
Year 2 (2020)	On-site surveillance audit	2 auditors on-site*	There are no Conditions but following a review of information audit in Year 1, SAI Global proposes to conduct an on-site surveillance audit in Year 2.
Year 3 (2021)	Review of information audit	2 remote auditors*	There are no Conditions and any required information can be provided remotely; therefore, SAI Global proposes to conduct a review of information audit.
Year 4 (2022)	On-site surveillance and re-assessment audit	2/3 auditors on-site*	As this will potentially be both a 4 th surveillance and a re-assessment audit, SAI Global proposes to conduct an on-site audit with 2/3 auditors on-site.

* As the fishery is entering its 2nd certification cycle and has no conditions a reduced team of 1 auditor is technically allowable however, it is highly unlikely that a single auditor could meet all the required competency criteria.

Table 32. Timing of surveillance audits.

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
Year 1 (2019)	TBD	Nov/Dec 2019	The main seed fishery generally takes place in Sept/Oct so conducting audit in Nov/Dec would allow time for all information relating to the past fishing season to be available.
Year 2 (2020)	TBD	Nov/Dec 2020	
Year 3 (2021)	TBD	Nov/Dec 2021	
Year 4 (2022)	TBD	TBD	Allow sufficient time for re-assessment to be completed before cert expiry date.

Table 33. Fishery Surveillance Program.

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 1	Review of information audit	On-site surveillance audit	Review of information audit	On-site surveillance and re-assessment audit

8.7. Appendix 7. Objections Process

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

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

(Reference: FCR 7.19.1)