

**Marine Stewardship Council (MSC) Year 2 Annual Surveillance
Report**

North Menai Strait mussel fishery

On behalf of

Bangor Mussel Producers Ltd.

Prepared by

Control Union Pesca Ltd

August 2018

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Glossary

Acronym	Definition
AIS	Automatic Identification System
BIM	Bord Iascaigh Mhara (Ireland's Seafood Development Agency)
BMP	Bangor Mussel Producers Ltd
CCW	Countryside Council for Wales
Cefas	Centre for Environment, Fisheries and Aquaculture Science
EA	Environment Agency
ETP	Endangered Threatened or Protected (species)
HRA	Habitat Regulations Assessment
IFCA	Inshore Fisheries Conservation Authority
IFG	Inshore Fisheries Group
INNS	Invasive Non-Native Species
MEC	ME Certification Ltd
MMO	Marine Management Organisation
MSC	Marine Stewardship Council
MSFOMA	Menai Strait Fishery Order Management Association
NRW	Natural Resources Wales
NWIFCA	North Western Inshore Fisheries Conservation Authority
RBF	Risk-Based Framework
SAC	Special Area of Conservation
SPA	Special Protection Area
TAC	Total Allowable Catch
UoC	Unit of Certification
WMFAG	Wales Marine Fisheries Advisory Group
WG	Welsh Government

1 General summary

Fishery name	North Menai Strait Mussel Fishery		
Unit(s) of assessment	Species and stock	European / blue mussel (<i>Mytilus edulis</i>)	
	Geographical range	Seed fishery area: Morecambe Bay, Caernarfon Bay, River Dee, Conwy Bay (Cheshire / N. Wales) Mussel culture area: Menai Strait, north of the Swellies.	
	Method of capture	Mussel dredge	
	Management Systems	Wales: Welsh Government (WG), Natural Resources Wales (NRW) England: Northwestern IFCA (NWIFCA), Natural England Menai Strait Fishery Order Management Association (MSFOMA)	
	Client group	Bangor Mussel Producers Ltd. - Myti Mussels Ltd., Extramussel Ltd., Ogwen Mussel Ltd and Deep Dock Ltd. harvesting seed mussels from Morecambe Bay, Caernarfon Bay, River Dee and Conwy Bay by mussel dredge and relaying these onto culture plots (lays) in the Menai Strait.	
Date certified	26 th October 2010	Date of expiry	9 th May 2021
Surveillance level and type	Level 3, on-site surveillance audit		
Date of surveillance audit	18 th June 2018		
Surveillance stage (tick one)	1st Surveillance		
	2nd Surveillance	X	
	3rd Surveillance		
	4th Surveillance		
	Other (expedited etc)		
Surveillance team	Lead assessor: Dr. Julian Addison		
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2 Background

At the time of the re-certification in May 2016, the Client, Bangor Mussel Producers (BMP) Ltd., consisted of four companies, Extramussel Ltd., Deepdock Ltd., Myti Mussels Ltd. and Ogwen Mussel Ltd. In 2017 another company, Mon Shellfish Ltd., joined the Client group. The addition of the new company had no implications for the nature of the fishery and its sustainability.

Currently there are 4 vessels operating in the fishery. Three of the vessels – Mare Gratia (B932), Valente (BS8) and Lottie Holly (BS12) – were operating at the time of the re-certification in 2016, but since then a fourth vessel, Stil Ostrea (B98), has joined the fleet. All four vessels are based in Port Penrhyn. Mare Gratia and Valente fish only for seed mussel, whereas Lottie Holly and Stil Ostrea operate only within the Fishery Order area.

Since recertification in 2016, the fishery continues to operate in the same areas and there have been no changes to the gear used in the fishery. Both the Welsh Government (WG) and the North Western IFCA insist on the use of approved dredge designs.

This fishery remains in conformity with the MSC scope requirements (FCR 7.4), no inseparable or practicably inseparable (IPI) stocks are caught in this fishery, and the fishery is not an Introduced Species Based Fishery as per the MSC FCR 7.4.4.

The fishery continues to be an enhanced bivalve fishery of the ‘catch and grow’ (CAG) type with translocation of seed mussels. As at the time of the re-certification, the fishery does not involve any ‘hatch and catch’ elements.

The fishery was recertified in May 2016 without conditions (ME Certification, 2016).

2.1 Principle 1

The North Menai Strait mussel fishery is an enhanced ‘catch and grow’ fishery with translocation of mussels. The fishery consists of the collection of seed mussels by dredging from four separate sites – Morecambe Bay, Caernarfon Bay, the River Dee and Conwy Bay – and then relaying the mussels for on-growing on culture plots known as “lays” in the Menai Straits. The main areas of seed mussel collection are subject to winter storms, which wash away seed mussels. Along with high predation rates, particularly in milder winters, the beds are therefore considered to be ephemeral and collection and relaying of seed mussel effectively increases survival rates of mussels. The areas of operation, including seed mussel collection areas and the lays for on-growing mussels, are unchanged since the re-certification.

Mussel production from the Fishery Order was 1200 tonnes in 2017/18 which is a significant decline from reported production figures in 2016/17 and 2015/16, which were 4940 and 5300 tonnes respectively. Prior to 2015/16, mussel production was much higher than the last three years (ME Certification, 2016). The very low production in the last year continues to reflect the current low availability of seed mussels across all four seed mussel areas.

At this 2nd surveillance audit, the Client reported on the results of the most recent mussel stock surveys carried out in 2018:

Morecambe Bay. Surveys of Morecambe Bay are conducted annually by the North Western Inshore Fisheries Conservation Authority (NWIFCA) and the Client by foot at low tide, by boat on the skears and by helicopter and hovercraft. A helicopter survey in May/June 2018 reported a very good settlement of seed mussels and an absence of starfish, which initially provided the possibility of harvesting significant quantities of seed mussels after they had grown during the high temperatures encountered this year over the summer months. However, a second survey in July reported a vast swarm of starfish, particularly over the South America and Falklands skears, and almost all the mussels had been preyed upon by the starfish. There remain some seed on the smaller skears inside Morecambe Bay, but it is likely now that only small quantities of mussels will be harvested. The Client is working with NWIFCA to consider whether access to these mussels can be permitted. Surveys conducted in 2017 had also shown a large settlement in March and April, but these mussels had disappeared by the end of May probably due to large spring tides or because the mussels had been buried by sand. There was no evidence of high levels of predation in 2017. Overall settlement in Morecambe Bay has been much less frequent than in previous years when a good settlement was observed in most years.

Dee Estuary. This area is surveyed by walking on the sands by NWIFCA on the northern (English) side of the estuary and by WG on the southern (Welsh) side. Similar to 2017, there was poor settlement on the southern side, and good settlement this year on the northern side, but NWIFCA manages this area and opportunities for vessel access are limited.

Caernarfon Bar. This area is surveyed remotely using a camera by the Client. This area has not supported a significant mussel seed settlement for nearly 10 years, and the situation is unchanged in 2018. A survey in June 2017 showed signs of a very good settlement of very small (<5mm seed) within the small cobble/stones and dynamic sand environment, but a follow-up survey in September could find no evidence that this initial settlement had survived. The Client considers that storm events in the early 2010s altered the bathymetric nature of the area which has reduced the likelihood of successful settlement of mussels.

Conwy Bay. This area is surveyed remotely using a camera and Roxanne by the Client. The poor levels of settlement observed for the last 8-9 years in this area continued in 2018.

In 2017/18 no seed mussels were collected from Morecambe Bay, Caernarfon Bar and Conwy Bay. The Client bought 109 tonnes of seed mussel hand-picked from the Dee Estuary and relayed them on the lays in the Menai Straits in consultation with NRW. In comparison, 4,200 tonnes of seed mussels were harvested from Morecambe Bay in 2016/17 for relaying.

In conclusion, there has been very little successful settlement of seed mussels in the four areas within the Unit of Certification (UoC), which had previously been shown to be reliable sources of seed over the last 20 years. Morecambe Bay in particular was previously a very reliable source of seed mussels, but settlements have been very poor in the last 3-4 years. However, historical scientific reports from the old North Western and North Wales Sea Fisheries Committee (the forerunner of NWIFCA) suggest that in the 1980s and 1990s, good settlement of seed mussel was the exception rather than the rule. In recent years, the Client has been investigating seed sources outside the UoC. In 2015/16, there was good settlement of seed mussels in Port Eynon in South Wales, but these mussels did not survive due to high predation rates. The Client has also been investigating seed mussel beds at Whiteford Point in the Burry Inlet in South Wales. The biomass in 2018 was in excess of 10,000 tonnes. The settlement area is an

extensive rocky promontory, but it is subject to strong currents and tidal regimes, and after settling first on the rocks, the mussels grow and produce mussel “mud” and become increasingly exposed and vulnerable to the strong currents and tidal regimes. Any successful seed harvesting therefore needs to occur after the small size stage on the rocky ground but before the larger seed are washed away. As noted above this area is not part of the UoC, and there would need to be a further assessment to evaluate this area before seed mussel from the Whiteford Point area could be incorporated within the UoC.

Research continues at Bangor University and Bord Iascaigh Mhara (BIM) in Ireland through the Irish Sea Portal Pilot (ISPP) of which one of the objectives is to develop a clearer understanding of the dynamics that drive mussel larvae dispersal and seed settlement at the pan-Irish Sea scale. The project includes modelling of shellfish larvae movement, monitoring of shellfish larvae to determine spawning patterns, and deployment of seed collectors and assessment of the resilience of seed. To date, the studies have shown that both Morecambe Bay and the western Irish Sea are important settlement areas, and modelling work suggests that larvae dispersal can occur from one side of the Irish Sea to the other. Settlement collectors show large numbers of larvae in the water column, but there are gaps in understanding concerning the mechanisms which control settlement on the seabed. Local gyres may be important, but it is likely that as well as hydrographical factors, mussel larvae are able to preferentially choose suitable substrates on which to settle. A further problem is that seed mussel may settle but move again and then there may be secondary settlement in another areas.

In addition, BMP members are sponsoring PhD studentships at Bangor University. Preliminary modelling work by Jonathan Demmer has shown that larvae produced by mussels in the Menai Strait can exit from the Menai Strait and therefore increase larvae settlement beyond the relaying sites. The modelling work does not yet include wind as a factor driving larvae dispersal or mussel larvae behaviour, but these preliminary results suggest that harvesting and relaying of seed mussel can increase future larvae production and settlement. The model can also be adapted to examine the source of mussel settlement in Morecambe Bay.

Further details of all the collaborative research projects between the shellfish industry and Bangor University can be found in Appendix 2.

A recent occurrence is the settlement of seed mussel on the stanchions of the offshore wind farm pylons in the area. It is not clear currently what impact this new pattern of settlement might have on mussel stock dynamics in the region.

2.2 Principle 2

The re-certification report noted that as there had been no change in the seed collection methods since the initial assessment, there had been no changes in effects on habitats and ecosystems (MEC Certification, 2016). Changes to retained or by-catch species are considered unlikely and to be at such low levels as to have no conceivable impact on populations of those species, and the client confirmed at both this 2nd surveillance audit and last year’s 1st surveillance audit (ME Certification, 2017) that there had been no change to retained or bycatch species since re-certification. Green crab and starfish are the main bycatch, both of which are predators of mussels. In general, bycatch species make up a low proportion of the total catch, although currently starfish abundance is high following mild winters. There was a formal study of bycatch by Dr Michael Ehrhardt of Molecular Biology and Ecology Solutions Ltd. in 2010 which concluded that the total by-catch was well below 5% of the main catch in Morecambe Bay and Caernarfon Bay (Ehrhardt, 2010). Informal figures on bycatch continue to be collected annually.

Authorisations are carefully considered by the relevant regulatory authorities with respect to ETP species that might rely upon the seed mussel resources e.g. eider ducks, common scoters, oystercatchers and knots, thereby helping to ensure that ecosystem structure, function and diversity is maintained. It is widely acknowledged that the quantities of seed mussel remaining are highly likely to be more than sufficient for the dietary needs of any ETP species.

The Client is also concerned about invasive non-native species (INNS) and has produced a Code of Good Practice which is being updated. The 'Code' addresses the risks posed by 7 species with the potential to become established in mussel seed areas and be transported to North Wales. The species include Chinese mitten crabs, Asian crabs *Hemigrapsus sanguineus*, sea squirts, *Didemnum vexillum* and slipper limpet *Crepidula fornicata*, which is a problem in South Wales. For example, there is the potential for the introduction of Chinese mitten crab to the Menai Strait and surrounding ecosystem / habitats. The Code of Good Practice aims to remove the risk of such an introduction occurring. In 2011, the seed fishery in the River Dee was closed because of concerns about Chinese mitten crabs in the estuary. Following the Code of Good Practice, BMP Ltd. agreed to stop fishing. NWIFCA has alerted the mussel industry to the recent identification of some mature female Chinese mitten crabs in the Walney Estuary, which could have implications for sourcing seed mussel from Morecambe Bay in the future. There have been no more sightings of Asian crabs during the last three years. The potential for the spread of sea squirts, *Didemnum vexillum*, has been heightened by the impact of Storm Emma on Holyhead Marina, but to date, there have been no reports of *D. vexillum* settling in new areas. The oyster disease *Bonamia* was detected in the Menai Strait in 2011; this had no major implications for the fishery since their key export area (the Oosterschelde) already has *Bonamia*, and no further outbreaks of *Bonamia* have been detected.

Since the re-certification the Environment (Wales) Act 2016 has received Royal Assent. The key parts of the Act include the sustainable management of natural resources enabling Wales' resources to be managed in a more proactive, sustainable and joined-up way, and clarification of the law in relation to shellfisheries management and marine licensing.

There have been no changes in fishing areas in relation to SACs and SPAs. A new SPA in Liverpool Bay was implemented in 2015 for scoters and red-throated divers, but this does not overlap with the Fishery Order area or the UoC. The North Anglesey Marine SAC was confirmed in 2017, for which the primary reason for selection of the site was the protection of harbour porpoise. There is no overlap of this SAC with the fishery and in any case, during the recertification process the assessment team expressed confidence that "any effects on harbour porpoise from the fishery operations are likely to be undetectable, well within any limits for their protection and are, in any case negligible." In summary, there are no identified or predicted adverse interactions of the fishery on proposed SACs/SPAs.

In addition to the fishery, mussels are an important food source for shellfish-eating birds. NWIFCA uses a bird model to determine how much mussel biomass is required to maintain local bird populations. In addition to the PhD study on mussel larvae distribution described above, there are two other ongoing PhD studies at Bangor University investigating eider duck populations in the Menai Straits and their dependency on mussels and on ecosystem services, in particular nutrient mediation by shellfish and the subsequent effect of shellfish harvesting. The Client expressed a desire to maintain and build on

collaboration with Bangor University. Further details of all the collaborative research projects between the shellfish industry and Bangor University can be found in Appendix 2.

2.3 Principle 3

In Wales, the fishery is managed by the Welsh Government (WG) and Natural Resources Wales (NRW), an amalgamation of three former agencies - Countryside Council for Wales, (CCW), Environment Agency (EA) and the Forestry Commission. Within Wales, the authorities and the Client collaborate on surveys, and the fishery is moving towards co-management. Whilst decision-making remains with WG, stakeholder involvement is formally recognised through the Wales Marine Fisheries Advisory Group (WMFAG), and three new regional Inshore Fisheries Groups (IFGs) were established in 2012, although the IFGs were operationally suspended in 2016. BMP Ltd. regularly attended the North Regional Inshore Fisheries Group.

In England, the fishery is managed by the NWIFCA and Natural England. The IFCA has a Technical, Science and Byelaw Sub-Committee which will make proposals on changes to regulations to be ratified by the full IFCA committee. Within NWIFCA, stakeholder involvement is facilitated through the Bivalve Mollusc Working Group which includes seed dredgers, hand-pickers, Natural England, NGOs and IFCA representatives. The Working Group discusses issues relevant to the mussel fishery, in particular the IFCA policy of limiting access to seed mussel collections to a fixed number of vessels.

WG and NWIFCA authorise seed harvests in Wales and England respectively. There is a three-stage process for obtaining a licence for seed mussel collection:

1. Evaluation of the stock through survey
2. Assessment under the Habitat Regulations (HRA) of likely significant effect (and Appropriate Assessment if necessary) conducted by relevant authority in Wales and England.
3. Authorisation to open the seed mussel bed by WG or NWIFCA.

There needs to be a timely process in place to permit successful harvesting of seed mussel for relaying. Seed mussels that initially settle on suitable ground need to be given time to grow to a size appropriate for relaying, but such settlements are highly vulnerable to being washed away from exposed areas by storms or currents or may be subject to very high levels of predation by starfish and shore crabs. There is therefore often only a very narrow time window in which harvesting of mussels can occur. It is essential therefore that a flexible and timely approval process is in place. The Client reported that within England, the processes implemented by NWIFCA can result in a rapid decision on whether harvesting can occur. More details of this process and the revised Byelaw 9 are given in information in Appendix 2 provided by Mandy Knott of NWIFCA. The revision of Byelaw 9 allows the IFCA to once again charge for the provision of an authorisation to fish for mussel seed within the district. For mussel seed beds managed by the Welsh Government, the Client reported that the process for approval for harvesting seed mussel was less flexible and has in the past resulted in failure to obtain approval before the seed mussel source has been lost to natural physical or predation events.

The relaying of the seed mussels on the private 'lays' is granted under the Menai Strait East Fishery Order which expires in 2022. WG is the grantor of the Fishery Order and the grantee is the Menai Straits Fishery

Order Management Association (MSFOMA) which issues leases to the various companies within the Client Group. MSFOMA includes mussel farmers, hand gatherers, NRW, representatives of local authorities and Bangor University. There have been some changes to the membership including the Chair of MSFOMA over the last year, but these changes should have no impact on the fishery and its management.

Statistics on seed harvests and sale of commercial mussels must be made to WG (monthly returns) and NWIFCA (weekly fishing sheets), and as licensed fishing vessels BMP Ltd members must submit log books to the Marine Management Organisation (MMO). Returns of quantities of consumption mussels are also made to the Centre for Environment, Fisheries and Aquaculture Science (Cefas).

There have been no changes in personnel or organisational changes within the Client Group since the re-certification. The Welsh Marine and Fisheries Action Group (WMFAG) continues to convene and provides a useful forum to share understanding and communications. However, a key Welsh Government officer, Andy Fraser, has left the employment of the Welsh government, and although his departure should not have any significant effect on the management and sustainability of the fishery, the Client reported that there had been an initial slowdown in dialogue between the management authorities and the industry.

There is a strong enforcement presence in the fishery and the Client reports that their vessels are regularly boarded and inspected by NWIFCA and the WG vessel. In addition, all vessels must have a functioning Automatic Identification System (AIS) on board at all times. If the system fails, then the vessel must stop fishing. There have been no reports of non-compliance since the re-certification.

2.4 TAC and catch data

Table 1. TAC and Catch Data

TAC	Year	2018	Amount	No TAC
UoA share of TAC	Year	2018	Amount	No TAC
UoC share of TAC	Year	2018	Amount	No TAC
Total green weight catch by UoC	Year (most recent)	2017/18	Amount	1200 tonnes
	Year (second most recent)	2016/17	Amount	4940 tonnes
Total seed mussel harvested	Year (most recent)	2017/18	Amount	109 tonnes* (Dee Estuary only)
	Year (second most recent)	2016/17	Amount	4200 tonnes (Morecambe Bay only)

* The 109 tonnes of Dee Estuary mussels were not harvested by the Client's vessels but were collected by hand-gatherers. However they come from one of the four seed mussel sites in the UoC and were relayed on the Fishery Order lays, and so are included in this table.

2.5 Traceability

There has been no change to the traceability system in place in the fishery since the recertification. Control Union Pesca determines that mussels collected by the Client Group in Morecambe Bay, Caernarfon Bar, River Dee and Conwy Bay, and which are then relayed and harvested in the North Menai Straits, remain eligible to enter into further certified chains of custody. Separate chain of custody certification is required after the intended change of ownership, which is onward sale through BMP Ltd as live and bagged mussels. Full details on the fishery's traceability can be found in the [Public Certification Report](#) (ME Certification, 2016). In view of recent declines in mussel settlement in the four seed mussel areas within the UoC, the Client is investigating alternative sources of seed mussels outside the UoC. Seed mussels from these alternative sources would not be certified and any such future harvesting and relaying of seed mussels from outside the UoC would have significant implications for traceability within the fishery in the future.

3 Assessment Process

The fishery was originally certified on 29th October 2010. This fishery was the first enhanced mussel fishery to be assessed and occurred before the assessment tree for enhanced bivalve fisheries was developed. The assessment tree included three additional PIs in Principle 1: 1.1.4 (genetic outcome), 1.2.5 (genetic management) and 1.2.6 (genetic information). Unlike the current bivalve tree, translocation was not considered under separate PIs, but was evaluated as a component of PIs 2.5.1, 2.5.2 and 2.5.3 (ecosystem outcome, management and information). PI 1.1.1 was scored using the RBF.

In May 2012, an additional Unit of Certification (UoC) was added to the fishery certificate. This was the addition of mussels collected in the River Dee. It was further extended to include Conwy Bay. The year 2 surveillance team of the original certification was made up of Dr Jo Gascoigne and Chrissie Sieben. The audit took place in Bangor in September 2012. The year 3 audit was completed on site by Jo Gascoigne and Kat Collinson in September 2013. All conditions were closed out by the third year and allowed it to be eligible for reduced re-assessment. The year 4 surveillance audit was also conducted on site in Bangor by Dr Jo Gascoigne and Kat Collinson in October 2014. The re-assessment was announced in June 2015. Principle 1 was scored in line with the RBF requirements. The assessment tree used in the re-assessment included the additional PI in Principle 1 on genetic outcome (1.1.4), but since the fishery does not involve any 'hatch and catch' elements, the MSC verified that PIs 1.2.5 and 1.2.6 were not required to be scored. Since translocation of seed mussel occurs within the fishery, PIs 2.6.1, 2.6.2 and 2.6.3 (translocation outcome, management and information) were scored during the re-assessment. The fishery was successfully recertified in May 2016. No new conditions were raised or old conditions re-opened.

In 2017 the 1st annual surveillance audit for the recertification was conducted offsite. The assessment team consisted of Dr Julian Addison. This year's 2nd annual surveillance audit was conducted on-site in Menai Bridge in June 2018. The assessment team consisted of Dr Julian Addison. As per 7.23.11 of the MSC Certification Requirements v2.0, during a second surveillance cycle, the CAB can appoint one auditor to conduct the surveillance audit.

The surveillance audit took place on 18 June 2018 and was attended by James Wilson, representing the Client, Lewis Le Vay of Bangor University and representing MSFOMA, and Jonathan Demmer of Bangor University (Table 2). Information was requested to evaluate whether there had been any significant changes to the fishery, for example, updated catch data, information on the stock, impacts on the wider ecosystem, management regimes and traceability. A representative from the NWIFCA was unable to attend the site visit meeting, but later provided the information set out in Appendix 2. Other stakeholders were invited by e-mail to submit information or comments on the fishery.

The fishery was assessed using MSC Certification Requirements version 2.0 for procedural stages and version 1.3 for scoring.

Table 2. Participants at the site visit meeting held at the Marine Centre Wales, Bangor University, Menai Bridge on 18 June 2018.

Participant	Affiliation
Julian Addison	Control Union Pesca Audit Team

James Wilson	Bangor Mussel Producers Ltd. (Client)
Lewis Le Vay	Bangor University and MSFOMA
Jonathan Demmer	Bangor University

3.1 Harmonisation

Table 3 below provides details of all of the mussel (*Mytilus edulis*) fisheries that are currently certified or are in assessment against the MSC Standard and if any harmonisation was completed in association with this fishery. A description of the logic for the decisions on these harmonisation decisions is provided in the discussion below the table.

Table 3. Showing Certified and In-Assessment MSC Mussel fisheries

Fishery Name	MSC Status	Harmonisation required		
		P1	P2	P3
DFPO Limfjord mussel and cockle fishery (subsuming the Vilsund Blue a/s Limfjord mussel & cockle dredge fishery)	Certified	No	No	No
Exmouth mussels (now withdrawn)	Certified	No	No	No
DFPO Inner Danish Waters blue shell mussel*	Certified	No	No	No
Ireland Bottom Grown Mussel (<i>Mytilus edulis</i>) fishery	Certified	No	No	No
Northern Ireland Bottom Grown Mussel (<i>Mytilus edulis</i>) fishery	Certified	No	No	No
Limfjord blue shell mussel (rope grown)	Certified	No	No	No
Germany Lower Saxony mussel dredge and mussel culture	Certified	No	No	No
Mussel translocation into the Oosterschelde	Certified	No	No	No
Netherlands blue shell mussel	Certified	No	No	No
Netherlands suspended culture mussel	Certified	No	No	No
Shetland & Scottish Mainland Rope Grown mussel Enhanced fishery	Certified	No	No	No
SSPO Swedish West Coast Rope Grown Mussel	Certified	No	No	No

Schleswig-Holstein blue shell mussel	Certified	No	No	No
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* The DFPO Inner Danish waters blue shell mussel fishery certification supersedes the previous three certifications covered by the Isefjord and East Jutland Danish blue shell mussel fishery, Seafood Romo East Jutland and Isefjord blue shell mussel dredge fishery and Vilsund Blue East Jutland blue shell mussel dredge fishery.

Principle 1 Harmonisation: With reference to the above table, a number of other mussel fisheries are certified MSC, but none have the same seed sources, so none require to be harmonised under P1 (the Irish fishery does take seed from Morecambe Bay but it is not included in their UoC (Public Certification Report (PCR) for the Ireland Bottom Grown Mussel Fishery (2013)).

Principle 2 Harmonisation: With reference to the above table, no currently certified or fisheries in assessment use the same lays as this fishery so none are required to be harmonised under P2.

Principle 3 Harmonisation: With reference to the above table, no currently certified or fisheries in assessment are under the same jurisdiction (Wales) so none are required to be harmonised under P3.

No harmonisation was therefore completed for this fishery.

4 Results

All conditions raised during the initial certification have been closed, and following re-certification of the fishery in 2016, there were no new conditions raised.

However, the team made one non-binding recommendation under PI 3.2.4, which was to include as many of the research papers supported by the fishery as possible on the BMP Ltd. website, as a convenient source of information for stakeholders, as well as to showcase the fishery's history of support for and involvement in scientific research.

At the 1st surveillance audit, the Client reported that no progress has been made on this recommendation. The Client agreed to review the options for making research papers more available, including publishing them on the website of the Menai Strait Fishery Order Management Association (MSFOMA) – www.msfoma.org.uk. At this 2nd surveillance audit, the Client again reported that no progress had been made on this specific recommendation. However, Professor Lewis Le Vay of Bangor University provided a summary of all current research on shellfisheries being undertaken at Bangor University and a list of recent publications, some of which relate to the mussel fishery (Appendix 2).

5 Conclusion

As indicated in Section 2, there have been no significant changes warranting a re-scoring of performance indicators. There have also been no material changes in the traceability system for this fishery.

The audit team confirms that this fishery continues to conform to the MSC Principles and Criteria for sustainable fishing. No new conditions or recommendations have been raised. No Performance Indicators have been re-scored. The surveillance plan has not been revised and remains at Level 3.

The audit team recommends that this fishery should remain certified.

6 Evaluation Results

There have been no changes to the Principle Level or individual Performance Indicator (PI) scores following this surveillance audit.

References

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<http://gov.wales/topics/environmentcountryside/consmanagement/natural-resources-management/environment-act/?lang=en>

JNCC North Anglesey Marine SAC.

<http://jncc.defra.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0030398>

ME Certification. 2016. Marine Stewardship Council (MSC) Reduced Reassessment Public Certification Report (PCR) North Menai Strait Mussel Fishery. On behalf of Bangor Mussel Producers Ltd. 163 pp.

ME Certification. 2017. Marine Stewardship Council (MSC) Year 1 Annual Surveillance Audit Report North Menai Strait Mussel Fishery MEC-F-017. On behalf of Bangor Mussel Producers Ltd. 13 pp.

Menai Strait Fishery Order Management Association (MSFOMA). www.msfoma.org.uk

Appendices

Appendix 1. Rescoring evaluation tables

Not applicable.

Appendix 2. Stakeholder submissions

The North Western IFCA were not available to meet the audit team during the site visit, but subsequently provide the following information by e-mail on 31 July:

“Hi Julian

Thanks for the opportunity to provide information from NWIFCA end of things on the MSC accreditation of the Menai Strait mussel fishery.

NWIFCA involvement with Menai Strait mussel fishery centres around the wild stock of seed mussel which we regulate, mainly in Morecambe Bay, but occasionally in other of our estuaries.

The NWIFCA has previously worked by providing written authorisation and delegating against certain of our byelaws to allow seed mussel dredging to go ahead. This has now been surpassed by the NWIFCA Dredge Byelaw 2017 (copy attached) whereby industry is invited to apply for a permit to dredge for seed mussel if the stock has reached a certain type of condition, the definition of which is as follows:

namely that the stock has been assessed as in imminent likelihood of being lost to the fishery through natural causes, and subsequently that a high proportion of it will not grow through to reach size; and that conditions pertain to fishing being possible without risk of damage to the cobble and boulder substrate conservation features. These include:

- settlement in high abundance and density, and;
- fast growing and high deposits of pseudofaeces (mussel mud), and;
- the mussel mud becoming very soft and loose and at risk of being washed out, taking the mussel with it;
- or dense settlement being heavily predated on by thousands of starfish.

The fishery is highly variable depending on the vagaries of the stock, and the changes in the dynamic environment of the north west coast and have to be assessed on a year by year basis.

Should conditions as stated above prevail, the fishery undergoes an HRA with advice from Natural England, and only on agreement through that process does the fishery proceed.

History has shown that this management approach provides the right kind of circumstances for mussel recruitment to occur year on year, and I therefore believe this fishery to be an excellent example of a sustainable fishery. Years when little seed is available for dredging are due to natural environmental dynamics of the Bay (eg sanded over skears resulting in lack of hard substrate as suitable habitats for

settlement). Each year we see substantial spat settlement across the various beds in the Bay. They just don't all provide suitable dredge fishery stock. Two are regularly fished by permitted hand-gatherers, one of which at Heysham Flat is authorised as a hand-gathered seed mussel fishery.

I trust this is sufficient information for your requirements. However if I can provide anything else please do let me know.

Kind regards

Mandy"

Mandy Knott
Senior Scientist
North Western Inshore Fisheries and Conservation Authority
1 Preston Street
Carnforth
LA5 9BY

NWIFCA Revised byelaw 9:

NORTH WESTERN INSHORE FISHERIES AND CONSERVATION AUTHORITYwww.nw-ifca.gov.ukE-mail: office@nw-ifca.gov.uk**Chief Executive:**
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CARNFORTH
LANCASHIRE, LA5 9BY**Tel: (01524) 727970****WHITEHAVEN OFFICE**
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WHITEHAVEN
CUMBRIA, CA28 7LN**MARINE AND COASTAL ACCESS ACT 2009 (C.23)****RESTRICTIONS ON THE USE OF A DREDGE BYELAW 2017**

The Authority for the North Western Inshore Fisheries and Conservation District in exercise of its powers under sections 155 and 156 of the Marine and Coastal Access Act 2009 makes the following byelaw for that District.

Interpretation

1. In this byelaw:
 - a. "AIS" means an operational transceiver of Class A or Class B design that transmits and can exchange accurate information with shore based facilities;
 - b. "the Authority" means the North Western Inshore Fisheries and Conservation Authority as defined in articles 2 and 4 of the North Western Inshore Fisheries and Conservation Order 2010 (S.I. 2010/2200);
 - c. "the District" means the North Western Inshore Fisheries and Conservation District as defined in articles 2 and 3 of the North Western Inshore Fisheries and Conservation Order 2010;
 - d. "dredge" means a dredge, scoop, or similar device and any auxiliary hydraulic equipment that is designed for or capable of taking sea fisheries resources;
 - e. "permit" means a permit issued by the Authority in accordance with this byelaw;
 - f. "specified vehicle" means a vehicle for which a permit to dredge has been issued under this byelaw;
 - g. "specified vessel" means a vessel for which a permit to dredge has been issued under this byelaw.

Prohibition

2. A person must not use a dredge for the exploitation of sea fisheries resources except in accordance with a permit issued under this byelaw.

Exception

3. Paragraph 2 does not apply to any person performing an act that would otherwise constitute an offence under this byelaw, if that act was carried out in accordance with a written permission issued by the Authority permitting that act for scientific, stocking or breeding purposes.

Permits

4. The Authority may issue a permit in respect of a specified vessel or specified vehicle authorising the use of a dredge to fish or take shellfish.
5. Contravention of a permit condition or a flexible permit condition constitutes an offence under this byelaw.

Permit conditions

6. A person may apply for a permit only in respect of:
 - a. a vessel for which the person is the owner, the majority shareholder in the company that is the owner, the leaseholder or the charterer or;
 - b. a vehicle for which the person is the owner, the majority shareholder in the company that is the owner or the leaseholder.
7. An undamaged identity tag supplied by the Authority must be permanently attached to a specified vehicle.
8. Permit applications may only be made using the form available from the Authority.
9. A permit is valid from the date of issue to 31 December of the same year unless specified in the permit.
10. A fee is payable prior to issue for each permit as follows:

a.	Vessels 15 meters overall length and over	£9,000
b.	Vessels less than 15 meters overall length	£1,000
c.	Vehicles	£1,000
11. The Authority may charge a fee of £50 to issue a replacement permit or vehicle tag.
12. A permit:
 - a. is not transferable from a specified vessel or specified vehicle to another vessel or vehicle;
 - b. must be available for inspection by an IFC officer during a compliance visit to a vessel or vehicle;
 - c. remains the property of and must be surrendered to the Authority if no longer required.
13. A permit holder must not obstruct an IFC officer.

14. Fishing returns must be filed as required by the Authority providing dates, times and locations of dredging and the quantity of fish taken. Returns including nil returns may be required for all months for which permits are valid.
15. The Authority may suspend a permit until outstanding returns have been filed.
16. A specified vessel used in conjunction with a permit must have a fully functioning AIS transmitting information including the vessel's identity course and speed at all times when the vessel is not stationary in port.
17. A permit holder must notify the Authority by phone, text or email at least 2 hours prior to commencement of fishing in conjunction with a permit.
18. A permit holder must notify the Authority of any change in the information provided to obtain a permit during the period when the permit is valid.

Flexible permit conditions

19. On receipt of the information specified in paragraph 20, the Authority may, in order to promote sustainable exploitation of sea fisheries resources, attach flexible conditions to a permit including some or all of the following:
 - a. dates, times or tides during which using a dredge for the exploitation of sea fisheries resources is permitted;
 - b. areas where using a dredge for the exploitation of sea fisheries resources is permitted;
 - c. species for which using a dredge to fish is permitted;
 - d. the type, size or design of dredge which is permitted;
 - e. the maximum number of permits which can be issued for a fishery;
 - f. the maximum number of dredges or total length of dredges that a vessel or vehicle may use in a fishery;
 - g. the total catch limit permitted within a specified period or a specified area.

Review procedure

20. The Authority will review flexible permit conditions no less than once every 4 years as follows:
 - a. the Authority will consult in writing with permit holders and such other stakeholders, organisations and persons as appear to the Authority to be representative of the interests likely to be substantially affected by changes in permit conditions;
 - b. the Authority will decide whether to add, vary or remove any permit condition taking account of the consultation responses and information received in accordance with paragraph 20;
 - c. following a decision by the Authority, permit holders will be notified in writing and permits will be amended as necessary with no charge.

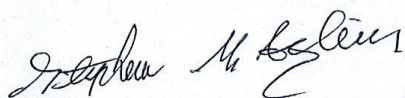
21. The information in paragraph 19 is:

- a. information and advice received from permit holders;
- b. scientific and survey information gathered by the Authority or provided to the Authority by any other organisations or persons as the Authority thinks fit;
- c. advice provided by Centre for Environment, Fisheries and Aquaculture Science, Natural England or any other organisations or persons as the Authority thinks fit;
- d. an impact assessment of any proposed changes;
- e. information from any other relevant source.

Revocation of byelaws

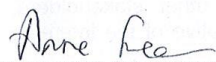
22. The byelaw with the title "Byelaw 12 Restrictions on Fishing for Bivalve Molluscan Shellfish" made by the North Western and North Wales Sea Fisheries Committee under the Sea Fisheries Regulation Act 1966 (c.38) section 5 and confirmed on 21 January 1998 is revoked.

I hereby certify that the above byelaw was made by the Authority at its meeting on the 17th day of March 2017



STEPHEN ATKINS
Chief Executive to the North Western Inshore Fisheries and Conservation Authority
1 Preston Street,
Carnforth
Lancashire, LA5 9BY

The Secretary of State for Environment, Food and Rural Affairs in exercise of the power conferred by section 155(4) of the Marine and Coastal Access Act 2009 confirms the Restrictions on the use of a Dredge Byelaw 2017 byelaw made by the North Western Inshore Fisheries and Conservation Authority on 17th March 2017.



A Senior Civil Servant for, and on behalf of, the Secretary of State for Environment, Food and Rural Affairs

Date: 13/12/2017

Explanatory Note

(This note does not form part of the byelaw)

This byelaw prohibits the use of dredges towed by vessels or vehicles for fishing within the NWIFC District without a permit. The permit application requirements and the conditions of use are set out in the byelaw. In addition the Authority may attach conditions which may be varied to promote sustainable exploitation of sea fisheries resources. The procedure by which permit conditions may be varied is set out in the byelaw.

Vessels for which permits have been issued must carry a functional automatic identification system (AIS) which meets Class B design (tested and certified compliant by a notified body under the Radio Equipment Directive) or the higher specification Class A design (International Maritime Organisation (IMO) performance standard in the SOLAS Convention Chapter 5 Regulation 19 Section 2.4.5).

Summary of current industry collaborative research on shellfish and shellfisheries at Bangor University, and a list of recent publications. Prepared by Professor Lewis Le Vay, Bangor University.

INDUSTRY COLLABORATIVE SHELLFISH RESEARCH AT BANGOR UNIVERSITY

CURRENT AND UPCOMING PROJECTS

The Shellfish Centre (£3.9M ERDF funding, 2018-2021)

The Shellfish Centre, established at Bangor University, will be a new hub for shellfish-related science and innovation. Based in the recently opened Marine Centre Wales, at the School of Ocean Sciences in Menai Bridge, and closely linked to parallel industry investment in new processing capacity in Bangor, the Shellfish Centre will promote collaborative research to support growth of the industry across Wales. The Shellfish Centre will be a facility that provides cutting-edge science, responding directly to industry research priorities, for example improving coastal water quality, new production methods and processing technologies, and expansion into new production areas and diversification to produce new high value species and products. Shellfish farming is one of the most efficient and sustainable forms of food production, with Wales already having a strong track record in successful and sustainable shellfish aquaculture; the UK's leading mussel production area in the Menai Strait was the world's first to be accredited by the Marine Stewardship Council and there are significant opportunities for further growth and expansion. The shellfish industry in Wales has a strong track record of investment in research and the involvement of industry will be integral to the Shellfish Centre, building on well-established relationships with Bangor University and supporting even greater industry participation and investment in research and innovation.

Irish Sea Portal Pilot, Interreg Ireland-Wales, 2016-2018

20 month project between Bangor University and BIM in Ireland. Focusing on mussel seed supply the project will monitor larvae and seed settlement patterns, developing models for predicting larval sources and settlement areas and piloting methods for settlement collection of seed. The project is also establishing a cluster of shellfish producers across the Irish Sea, to help identify common resource issues and to develop new products and processes that can benefit the industry through a programme of collaborative research.

Menai Offshore Subsurface Shellfish (EMFF, 2018-2021 – pending award)

This 3 year project will build on ISPP, conducting commercial scale trials of rope-based offshore mussel seed collection, to test viability as an alternative or supplement to fishing of intertidal seed beds to supply the Menai East Several Order production area. It will also test the potential for grow-out of mussels on offshore rope systems in Welsh waters, with hydrodynamic, ecological and water quality modelling to determine suitable potential production areas.

Bluefish (Interreg Ireland-Wales, 2017-2021)

4 year project, collaboration between Bangor University, Aberystwyth University, Swansea University, University College Cork, Marine Institute, BIM. Addressing vulnerability of shellfish and fish stocks to climate change – covering fisheries and aquaculture and with significant components on shellfish populations, disease and water quality.

Viraqua (NERC 2016-2018)

3-year NERC-funded consortium – Bangor, Liverpool, Cambridge, CEH, CEFAS – with support from Deepdock Ltd, SAGB, NRW, EA, Public Health Wales, Conwy Council. Investigating the origin and fate of human pathogenic viruses in the freshwater-marine continuum – with a focus on the Conwy. Developing novel methods for the quantification of enteric viruses in environmental matrixes. Identifying and quantify harmful viruses in the Conwy catchment, using water, sediment, wastewater and shellfish samples. Assessing the infectivity of viruses. Modeling viral movement in the Conwy river and estuary and improving current risk assessment for waterborne viruses.

CURRENT COLLABORATIVE PhDs SUPPORTED BY ESF/KESS AND INDUSTRY PARTNERS

Balancing Commercial Seed Mussel Harvest and Shorebird Conservation - Alistair Feather, Line Cordes, Jan Hiddink (Bangor Univ) Co-sponsored by Myti Mussels Ltd

Valuing the ecosystem services provided by shellfish aquaculture - Andrew Olivier, Shelagh Malham, Lewis Le Vay (Bangor Univ), Laurence Jones (CEH), Mike Christie (Aberystwyth Univ). Co-sponsored by Deepdock Ltd

Simulating the temporal and spatial variability of North Wales mussel populations – Jonathan Demmer, Shelagh Malham, Peter Robins, Simon Neill (Bangor Univ). Co-sponsored by Extramussel Ltd

COMPLETED PROJECTS

Food Standards Agency (Direct contract 2017-2018) A desk based study reviewing current evidence to devise criteria for the selection and environmental, economic and financial assessment of Active Management Systems in classified shellfish harvesting areas (Bangor University)

Bacterial and Viral Dynamics (UKWIR 2011-2013) Investigation of pathogen dynamics and persistence from treatment works to estuaries and shellfish.

REPROSEED (EU FP7 2010-2014) Research to improve production of seed of established and emerging bivalve species in European hatcheries

BLUESEED (EU FP62005-2007) Technology development for a reliable supply of high quality seed in blue mussel farming

SEAFARE (EU Interreg Atlantic Area 2007-2013) Sustainable and Environmentally friendly Aquaculture For the Atlantic Region of Europe. A consortium project focusing on research to support sustainable coastal aquaculture,

SUSFISH (EU Interreg Ireland-Wales 2009-2013) Research on shellfisheries in the Irish Sea and responses to climate change using oceanographic models to predict on shellfish productivity and connectivity to inform adaptation or mitigation strategies.

Atlantic Arc Aquaculture Group (EU Interreg Atlantic Area 2002-2007) Research to support sustainable coastal aquaculture

Examples of recent publications

Bussi, G., Whitehead, P.G., Thomas, A.R.C., Masante, D., Jones, L., Jack Cosby, B., Emmett, B.A., Malham, S.K., Prudhomme, C., Prosser, H. (2017) Climate and land-use change impact on faecal indicator bacteria in a temperate maritime catchment (the River Conwy, Wales), *Journal of Hydrology* 553: 248-261

Clements K, Giménez L, Jones D, Wilson J, Malham S (2013) Epizoic barnacles act as pathogen reservoirs on shellfish beds. *J Shellfish Res* 32, 533-538

Farkas K, Peters DE, McDonald JE, Malham SK, de Rougemont A Jones D (2017) Evaluation of Two Triplex One-Step qRT-PCR Assays for the Quantification of Human Enteric Viruses in Environmental Samples. *Food Environ Virol* 9:342–349

Farkas K, Cooper D, McDonald JE, de Rougemont A, Malham SK, Jones D (2018) Seasonal and spatial dynamics of enteric viruses in wastewater and in riverine and estuarine receiving waters. *Science of the Total Environment* 634: 1174-1183

Galley TH, Beaumont AR, Le Vay L, King, J., (2017). Influence of exogenous chemicals on larval development and survival of the king scallop *Pecten maximus* (L.). *Aquaculture* 474: 48–56.

Hassard F, Sharp JH, Taft H, Le Vay L, Harris JP, McDonald JE, Tuson K, Wilson J, Jones DL, Malham SK (2017) Critical Review on the Public Health Impact of Norovirus Contamination in Shellfish and the Environment: A UK Perspective. *Food Environ Virol* (2017). doi:10.1007/s12560-017-9279-3

Galley TH, Beaumont AR, Le Vay L, King JW (2017) Influence of exogenous chemicals on larval development and survival of the king scallop *Pecten maximus* (L.) *Aquaculture in press*

Perkins, T.L., Perrow, K., Rajko-Nenow, P., Jago, C.F., Jones, D.L., Malham, S.K., McDonald, J.E., 2016. Decay rates of faecal indicator bacteria from sewage and ovine faeces in brackish and freshwater microcosms with contrasting suspended particulate matter concentrations. *Sci. Total Environ.* <http://dx.doi.org/10.1016/j.scitotenv.2016.03.076>

Robins, P.E., Skov, M.W., Lewis, M.J., Gimenez, L., Davies, A.G., Malham, S.K., Neill, S.P., McDonald, J.E., Whitton, T.A., Jackson, S.E., Jago, C.F., 2016. Impact of climate change on UK

estuaries: a review of past trends and potential projections. *Estuar. Coast. Shelf Sci.* 169: 119-135

Winterbourn JB, Clements K, Lowther JA, Malham SK, McDonald JE, Jones DL (2016) Use of *Mytilus edulis* biosentinels to investigate spatial patterns of norovirus and faecal indicator organism contamination around coastal sewage discharges, *Water Research* 105: 241-250

Owens L., Malham S. (2015) Review of the RNA Interference Pathway in Molluscs Including Some Possibilities for Use in Bivalves in Aquaculture. *Journal of Marine Science and Engineering* 3 (1), 87-99

Roche R.C, J. M. Monnington, R. G. Newstead, K. Sambrook, K. Griffith, R. H. F. Holt, S. R. Jenkins (2015) Recreational vessels as a vector for marine non-natives: developing biosecurity measures and managing risk through an in-water encapsulation system. *Hydrobiologia*: 750:187–199

Flannery, J., Rajko-Nenow, P., Winterbourn, JB., Malham, SK., Jones, DL. (2014). Effectiveness of cooking to reduce Norovirus and infectious FRNA bacteriophage concentrations in *Mytilus edulis*. *Journal of Applied Microbiology*. DOI: 10.1111/jam.12534.

Lynch, SA., Morgan, E., Carlsson, J., Mackenzie, CM., Wooton, EC., Rowley, AF., Malham, SK., Culloty, SC. (2014). The health status of mussels, *Mytilus* spp., in Ireland and Wales with molecular identification of a previously undescribed haplosporidian. *J. Invertebrate Pathology* 118: 59-65.

Mackenzie, CM., Lynch, SL., Culloty, SC., Malham, SK. (2014). Future oceanic warming and acidification alter immune response and disease status in a commercial shellfish species *Mytilus edulis* L. *Plos One*. DOI: 10.1371/journal.pone.0099712.

Mackenzie, CL., Ormondroyd, GA., Curling, SF., Ball, RJ., Whiteley, NM., Malham, SK. (2014). Ocean warming, more than acidification, reduces shell strength in a commercial shellfish species during discontinuous feeding. *Plos One*. DOI: 10.1371/journal.pone.0099712.

Malham SK, Rajko-Nenow P, Howlett E, Tuson KE, Perkins TL, Pallett DW, Wang H, Jago CF, Jones DL, McDonald JE. (2014). The interaction of human microbial pathogens, particulate material and nutrients in estuarine environments and their impacts on recreational and shellfish waters. *Environmental Science. Processes & Impacts*. 16(9): 2145-2155.

Owens L., Malham S. (2015) Review of the RNA Interference Pathway in Molluscs Including Some Possibilities for Use in Bivalves in Aquaculture. *Journal of Marine Science and Engineering* 3 (1), 87-99

Perkins TL, Clements K, Baas JH, Jago CF, Jones DL, Malham SK, McDonald JE. (2014). Sediment composition influences spatial variation in the abundance of human pathogen indicator bacteria within an estuarine environment. *PloS One*. 9 (11) e112951.

Robins PE, Tita A, King JW, Jenkins SR (2017) Predicting the dispersal of wild Pacific oysters *Crassostrea gigas* (Thunberg, 1793) from an existing frontier population – a numerical study. *Aquatic Invasions* 12: 117–131.