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The Wild Oysters Project Conwy Bay - Cultch Re-levelling

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Prepared by:

MarineSpace Ltd

MarineSpace
AN ERM GROUP COMPANY

MarineSpace Ltd
2 Charlotte Place
Southampton
SO14 0TB

Prepared for:

Zoological Society of London

Zoological Society of London
Regent's Park
London
NW1 4RY

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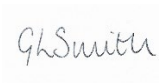
13/11/2023	Grace Leyton-Smith	0.1	Internal Draft	
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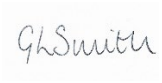
12/01/2024	Grace Leyton-Smith	0.3	Internal Draft	
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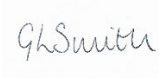
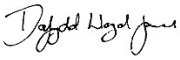
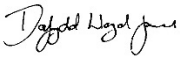
12/02/2024	Grace Leyton-Smith	1.1	Internal Draft - Addressing Client / Regulator Comments	
20/02/2024	Dafydd Lloyd Jones	1.2	Technical Review / Editorial Review	
21/02/2024	Dafydd Lloyd Jones	2.0	Director Sign-off / External Document	
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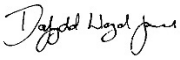
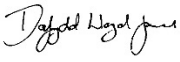
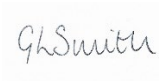
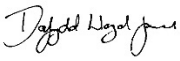
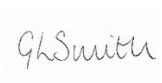
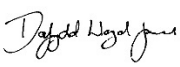
18/03/2024	Dafydd Lloyd Jones	2.2	Technical Review / Editorial Review	
18/03/2024	Dafydd Lloyd Jones	3.0	Director Sign-off / External Document	
25/04/2024	Grace Leyton-Smith	3.1	Internal Draft - Addressing Client / Regulator Comments	
29/04/2024	Dafydd Lloyd Jones	4.0	Director Sign-off / External Document	
29/05/2024	Grace Leyton-Smith	4.1	Internal Draft - Addressing Client / Regulator Comments	
05/06/2024	Dafydd Lloyd Jones	5.0	Director Sign-off / External Document	

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Glossary

Abbreviation	Description
Blue Marine	Blue Marine Foundation
EEZ	Exclusive Economic Zone
ENORI	Essex Native Oyster Restoration Initiative
EUNIS	European Union Nature Information System
GEP	Good Ecological Potential
HRA	Habitats Regulations Assessment
INNS	Invasive Non-Native Species
iVMS	Inshore Vessel Monitoring System
kWh	Kilowatt Hours
LSE	Likely Significant Effect
MLA	Marine Licence Application
MMO	Marine Management Organisation
Nm	Nautical Mile
NRW	Natural Resources Wales
OEL	Ocean Ecology Ltd
SID	Supporting Information Document
SSC	Suspended Solids Concentration
UKHO	United Kingdom Hydrographic Office
VMS	Vessel Management System
WFD	Water Framework Directive
WNMP	Welsh National Marine Plan
ZSL	Zoological Society of London

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1. Introduction

The project has set up restoration hubs in North Wales, in Conwy Bay; and northeast England, in Tyne and Wear; with local partners Bangor University and Groundwork North East and Cumbria, combining local knowledge and expertise with the knowledge gained from restoration projects including the Solent Oyster Restoration Project and the Essex Native Oyster Restoration Initiative (ENORI). The Wild Oysters Project successfully deployed a native oyster reef at the Tyne and Wear site in Summer 2023 and began to deploy cultch material at the Conwy Bay site in June 2023, with plans to complete the restoration site in Summer 2024 (pending the levelling of the existing cultch material at the site).

This Supporting Information Document (SID) has been produced by MarineSpace Ltd, an ERM Group Company to support a new Marine Licence Application (MLA) to be submitted to Natural Resources Wales (NRW), on behalf of the client, the Zoological Society of London (ZSL). This new MLA links to an existing marine licence, DEML2284, which was granted for the Conwy Bay site by NRW on 06 April 2023. This existing marine licence, DEML2284, allows for the deposit of cultch (shells and stone material) on the seabed, deployment of spat collectors for the purposes of native oyster habitat restoration, and removal of sediment via grab sampling as part of the project monitoring plan.

Following the deposition of cultch material (locally sourced limestone gravel) under DEML2284, between 08-21 June 2023, a post-deposition bathymetric survey was undertaken as soon as weather conditions allowed, on 06 July 2023. Multibeam surveys for post deployment monitoring were previously described in the SID for DEML2284, and agreed with NRW. Results of the bathymetric survey revealed several raised areas to be present within the West Bwrling licensed area. On 18 July 2023 it was confirmed with the Conwy Council Harbour Master, Matthew Forbes, that these peaks do not pose a risk to navigation, however a local notice to mariners regarding the raised areas was still issued, and is currently in place. Further to this, the results of the bathymetric survey were also shared with:

- The UK Hydrographic Office (29/08/2023);
- Rowland Sharp from the Marine Area Advice and Management Team at NRW (19/07/2023); and
- Dylan Griffith, Marine Enforcement Officer at the Welsh Government Marine and Fisheries Division (19/07/2023).

Additional multibeam surveys were later conducted on 16 November 2023, and 03 May 2024, as part of post-deployment monitoring. The surveys showed that limestone gravel remained in the West Bwrling licence area, and also indicated natural redistribution of the limestone gravel, as maximum peak height had reduced to 1.07 m in recent surveying in May 2024. Another multibeam survey is planned later in summer 2024 (weather permitting) as part of post-deployment monitoring, and seabed maps will be updated prior to the proposed seabed levelling works.

Following consultation with the NRW Marine Licensing Team, advice was provided that small-scale re-levelling works would be required at the seabed, in order to meet information provided within

the SID for DEML2284, which stated that cultch will be deposited up to a maximum height of 0.5 m above the seabed.

The NRW advice also confirmed that a MLA should be submitted for these additional works, as they would involve dredging of the cultch material on the seabed, which is deemed to be licensable by NRW, under the Marine and Coastal Access Act 2009 (note that no sediment or cultch will be removed, only redistributed within the licensed area) - see Section 2.1 for marine licensing requirements.

Therefore, this report details the background of the project, provides additional information about the project, and details the project location and timeline.

1.1. Report Structure

This SID accompanies the MLA, and is structured as follows:

- Section 2: Relevant Policy and Legislation;
- Section 3: Method Statement;
- Section 4: Consultation;
- Section 5: Environmental Impact Summary; and
- Section 6: Conclusion.

Additionally, the following assessments have been produced to accompany the application:

- Appendix A: Habitat Regulations Assessment;
- Appendix B: Water Framework Directive Assessment; and
- Appendix C: Overview of Fish and Shellfish Spawning Areas.

The following documents are also attached to provide further context to this application:

- MS008 Marine Plough - An operating statement from Holyhead Harbourmaster regarding the MS008 marine plough;
- Specification document of the *St David's* tug vessel;
- DEML2284 Marine Licence and supporting application documents; and
- Wild Oysters Project Biosecurity plan.

1.2. Background

The Wild Oysters Project: Conwy Bay aims to restore native oyster habitat, with the wider aim of providing wider ecosystem service benefits. The project is using the following restoration approaches:

1. Phase 1 - suspended broodstock cages ("*nurseries*") containing aggregations of mature individuals (this phase of the project has been consented by NRW and is currently in progress with "*nurseries*" presently in the water at separate sites in Conwy); and
2. Phase 2 - laying of cultch (shells and stones) and oysters onto the seabed to improve substrate availability and, therefore, seabed habitat for native oyster and other species.

1.3. Location

Existing marine licence DEML2284, allows for cultch to be deposited in 3 licensed sites, which have a total combined area of approximately 0.2 km^2 and are highlighted in Figure 1.3-1. Under DEML2284, the project may deploy cultch multiple times over several years across these sites, scaling up to a maximum combined area of 0.05 km^2, notably lower than that of the overall licensed area.

Of these sites, 650 tonnes (approximately 430 m^3) cultch has been deposited at the West Bwrling Site between 08-21 June 2023. The West Bwrling Site is 0.08 km^2 (520 m x 160 m) and the coordinates are provided in Table 1.3-1. The re-levelling being applied for via this new MLA will, therefore, currently only be required to be undertaken within the boundaries of the West Bwrling Site. There is also potential for future re-levelling events until the expiration of the existing MLA DEML2284 on 05 December 2029. This allows for any possible future re-levelling that may need to be undertaken after successive cultch or shell deployments within the West Bwrling Site.

Table 1.3-2 presents a summary of the project details used to inform the Habitats Regulations Assessment (HRA) and Marine Conservation Zone Risk Assessment (MCZRA).

Table 1.3-1: Coordinates of Conwy Bay licensed areas

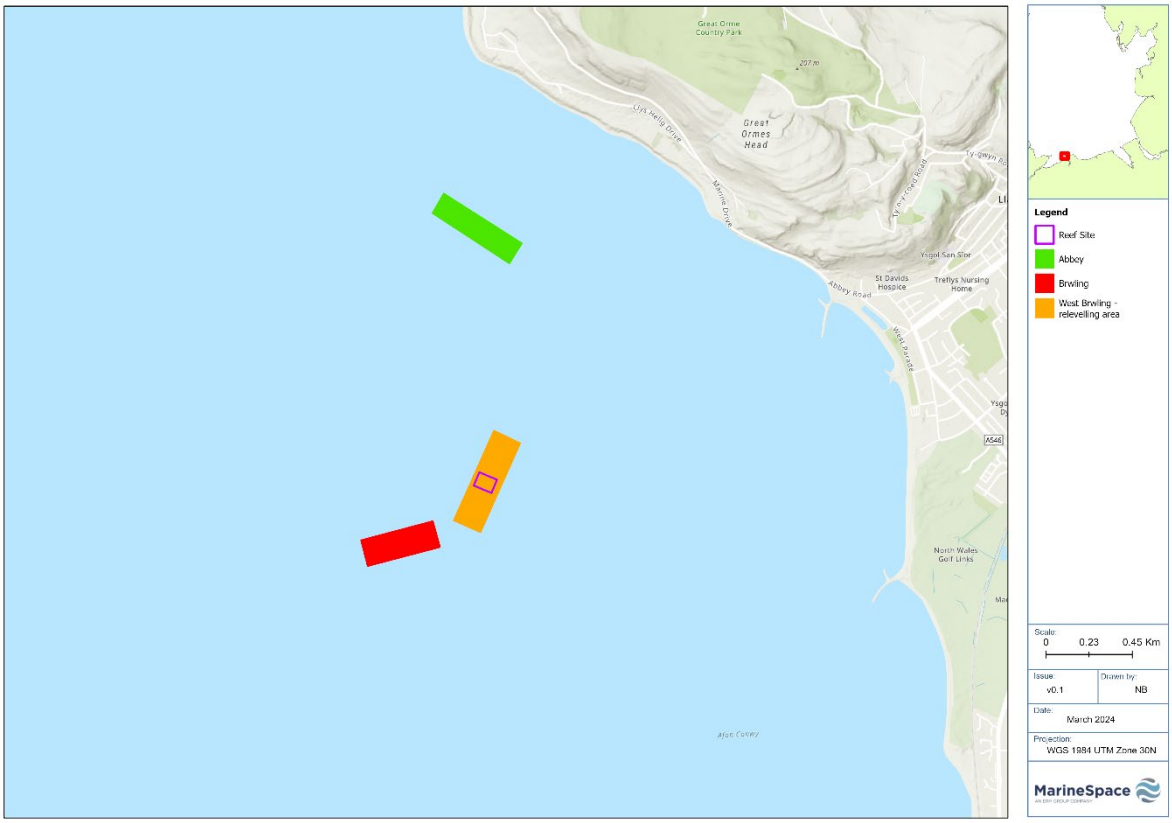
Licensed Area	LAT	LON
Abbey	53.3265318°N	-3.8798208°W
	53.3255450°N	-3.8807460°W
	53.3231957°N	-3.8745802°W
	53.3242051°N	-3.8735596°W
Bwrling	53.3089449°N	-3.8854331°W
	53.3102238°N	-3.8860089°W
	53.3111781°N	-3.8802965°W
	53.3098956°N	-3.8796802°W
West Bwrling (re-levelling area)	53.3148517°N	-3.8734793°W
	53.3154556°N	-3.8756607°W
	53.3111689°N	-3.8787716°W
	53.3105959°N	-3.8765791°W

Table 1.3-2 Summary of project details used to inform the Habitats Regulations Assessment

Parameter		Value
Spatial Extent	Area 3 (West Bwrling)	0.08 km^2
Water Depth	Area 3 (West Bwrling)	1 m (above ordinance datum)
Distance from Shore	Area 3 (West Bwrling)	1,600 m
Cultch	Timing (re-levelling)	Year Round
	Volume	<5,000 m^3
	Height	≤0.5 m
	Spatial Extent (Cultch laying, as currently licensed)	0.05 km^2 (225 × 225 m)
	Spatial Extent (re-levelling, contained within currently licensed areas)	≤0.05 km^2
Native Oyster *Ostrea edulis*	Timing	Year-round
	Density (average across site, as currently licensed) [1]	1 per 1 m^2
	Total Count (as currently licensed)	50,000
Post-introduction Monitoring	Geophysical	Multibeam bathymetry
	Physical	Sediment grab samples
	Biological	Underwater video
Vessels	Cultch Deposition (as currently licensed)	Hopper/flat-bottomed barge/landing craft/mussel dredger, or similar
	Oyster Introduction (as currently licensed)	Small inshore vessel/mussel dredger, or similar
	Re-levelling (as covered within this assessment	Small inshore vessel/tug vessel, or similar
	Surveys (as currently licensed)	Small inshore survey vessel

[1] NB: Oyster density provided is across all three licensed areas, not just the West Bwrling licence area.

Figure 1.3-1: Location of the reef site which requires re-levelling within the West Bwrling licensed area, and location of other Conwy Bay licensed areas



The bathymetric survey data obtained on 06 July 2023 identified 3 peaks within the Conwy Bay site of 2 m in height, and approximately 5 smaller peaks of 1 m in height. Seabed elevations >0.5 m are illustrated within Figure 1.3-2. This highlights the three large peaks that transect just south of the centre of the reef site and several smaller peaks which are scattered throughout the reef deployment site. These results are further highlighted in Figure 1.3-3 which shows the difference in seabed elevation between 2022-2023, post cultch deployment.

Additional multibeam surveys were also conducted on 16 November 2023 and 03 May 2024, as part of post-deployment monitoring. The limestone gravel remained in the West Bwrling licence area, and a natural redistribution of the limestone gravel was indicated, as maximum peak height had reduced to 1.07 m (Figure 1.3-3 and Figure 1.3-4).

A further multibeam survey is planned in late summer 2024 (weather permitting) as part of post-deployment monitoring. Seabed maps will be updated with these data, prior to the proposed re-levelling works. The results of the multibeam survey will feed into the proposed methodology of re-levelling the material, for example if there has been a significant reduction in the height and distribution cultch peaks.

Figure 1.3-2: Bathymetric survey results after limestone gravel deployment highlighting the difference in seabed elevation >0.5 m (March 2022-July 2023), maximum peak height 2.08 m

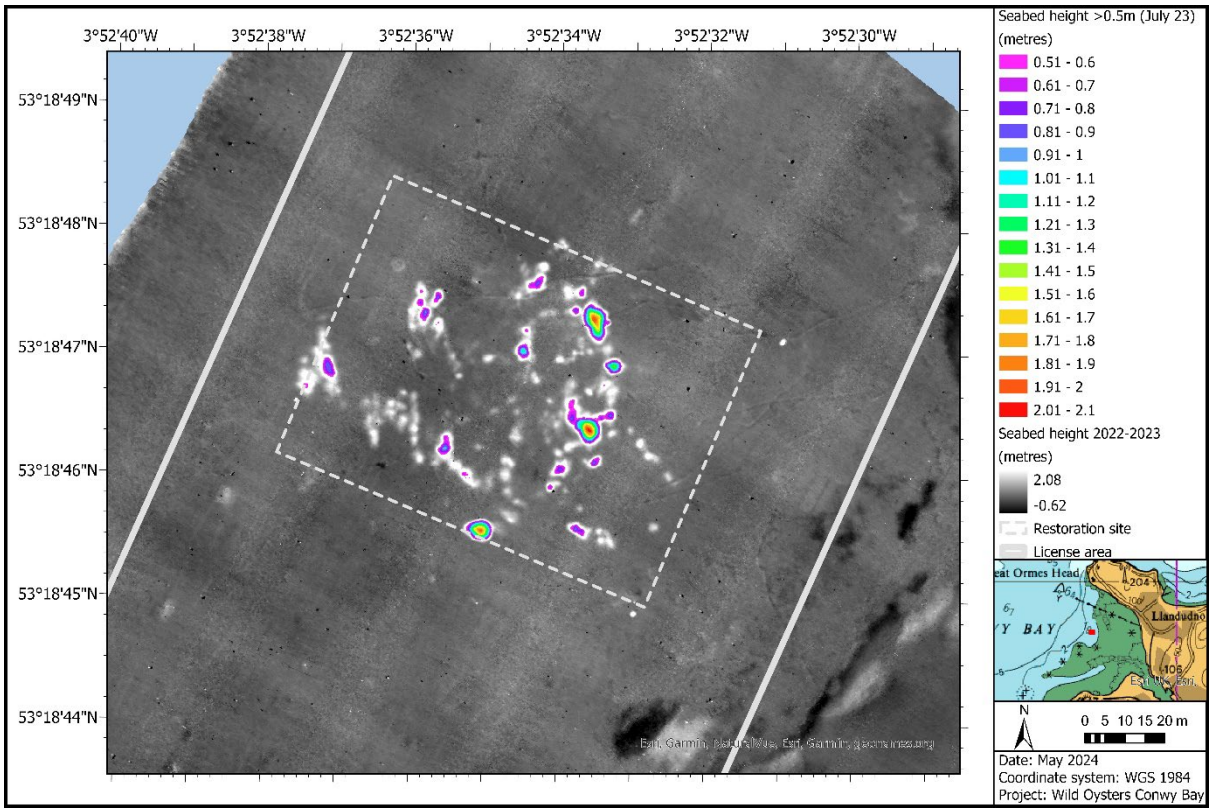


Figure 1.3-3: Bathymetric survey results which highlight the difference in seabed elevation (March 2022-Novemeber 2023), maximum peak height 1.42 m

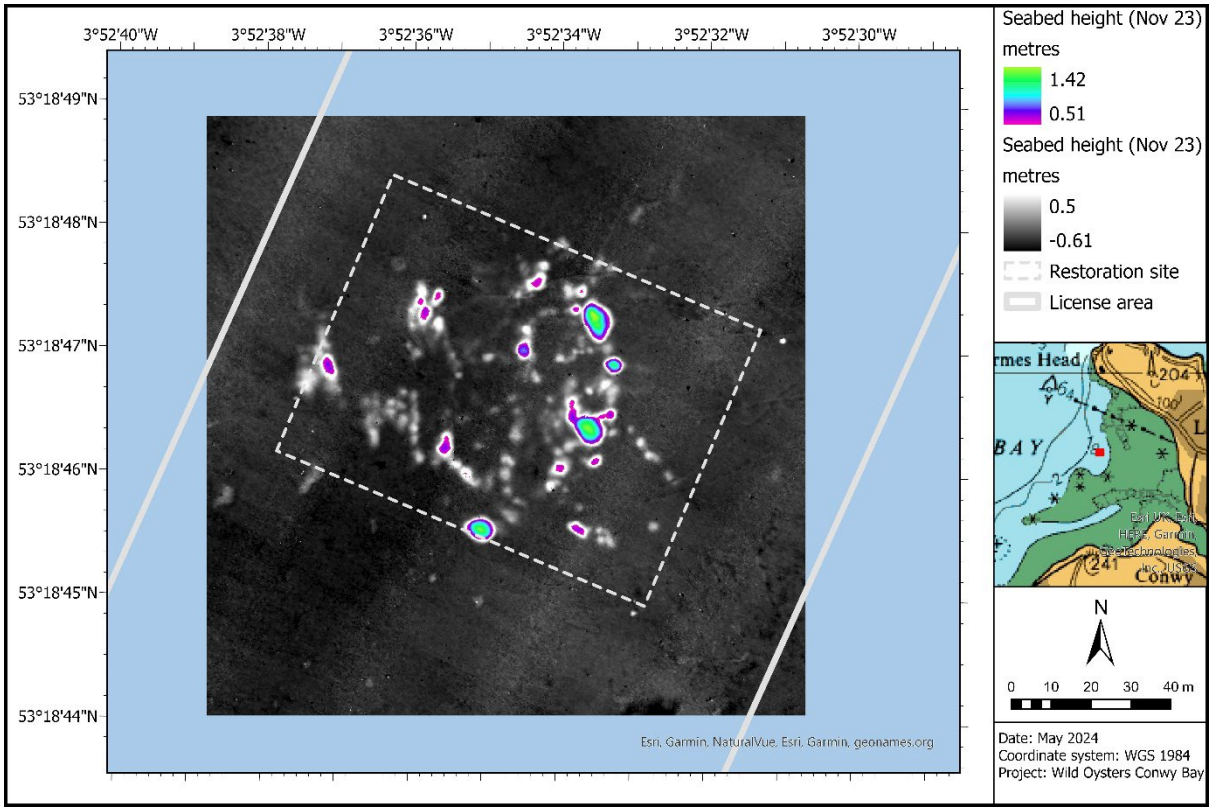
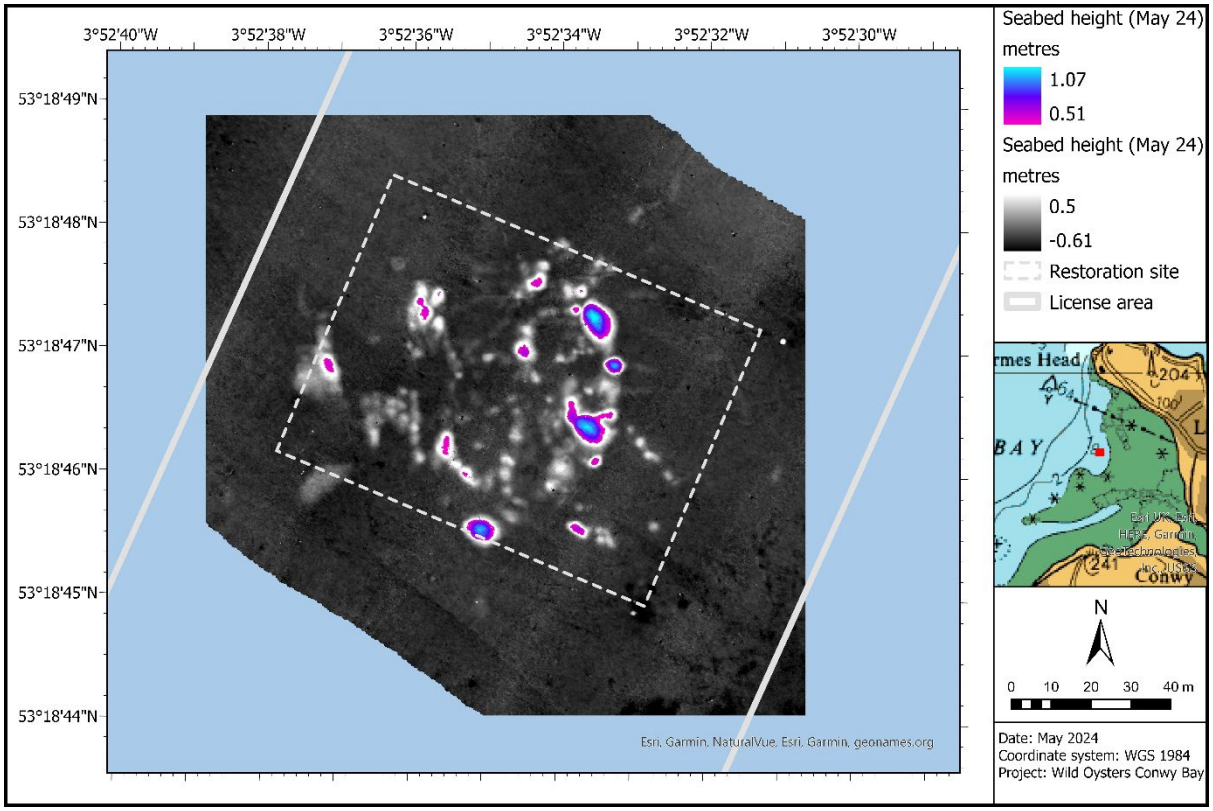


Figure 1.3-4: Bathymetric survey results which highlight the difference in seabed elevation (March 2022 – May 2024), maximum peak height 1.07 m



2. Relevant Policy and Legislation

2.1. Marine and Coastal Act 2009

NRW is the licensing authority for the Welsh inshore and offshore region. Under the Marine and Coastal Access Act 2009, a marine licence is required for carrying out a licensable marine activity, summarised as:

- Deposit any substance or object, in the sea or on or under the seabed;
- Construct, alter or improve any works either in or over the sea, or on or under the seabed;
- Use a vehicle, vessel, aircraft, marine structure or floating container to remove any substance or object from the seabed; and
- Carry out any form of dredging, whether or not involving the removal of any material from the sea or seabed.

The proposed works include the dredging of a substance on the seabed using a vessel, which constitutes a marine licensable activity under the Marine and Coastal Access Act 2009. Therefore, a marine licence is required.

2.2. Welsh National Marine Plan

The Welsh National Marine Plan (WNMP) is the framework for preparing Marine Plans and taking decisions affecting the marine environment in Wales. The WNMP is divided by areas, the marine inshore (mean high water – 12 nautical miles (nm)) and offshore region (12 nm to the extent of the Welsh Exclusive Economic Zone (EEZ)). The project sits within the inshore region of the Plan. The aim of the WNMP is to ensure Welsh seas are clean, healthy, safe, productive and biologically diverse, through:

- An ecosystem approach, natural resources are sustainably managed and our seas are healthy and resilient, supporting a sustainable and thriving economy;
- Access to, understanding of and enjoyment of the marine environment and maritime cultural heritage, health and well-being are improving;
- Blue Growth meaning more jobs and wealth are being created and are helping coastal communities become more resilient, prosperous and equitable with a vibrant culture; and
- The responsible deployment of low carbon technologies, the Welsh marine area is making a strong contribution to energy security and climate change emissions targets.

This project is in support of, and supplementary to, the native oyster habitat restoration in Conwy and is in alignment with a key objective of the WNMP, which promotes healthy, functioning marine ecosystems, and protects marine habitats and species. Table 2.2-1 provides an overview of how the project is aligned with several key policies outlined in the WNMP.

Table 2.2-1: Key relevant Welsh National Marine Plan Policies

Policy Ref.	Policy text	Relevance to proposed project
Gen_01	**Planning Policy** There is a presumption in favour of the sustainable development of the plan area in order to contribute to Wales' well-being goals.	The project intends to restore native oyster habitats and connect local communities with marine conservation and native oyster restoration.
ECON_02	**Coexistence** Proposals should demonstrate how they have considered opportunities for coexistence with other compatible sectors in order to optimise the value and use of the marine area and marine natural resources.	Consultation has taken place between Welsh regulators, Blue Marine, ZSL, British Marine and with Conwy harbour authorities and Conwy Mussels Company, as well as the wider local working group. Since limestone deployment additional members have been added to the local working group, including the Chair of the Welsh Fishermen's Association.
SOC_05	**Historic Assets** Proposals should demonstrate how potential impacts on historic assets and their settings have been taken into consideration and should, in order of preference: a) avoid adverse impacts on historic assets and their settings; and/or b) minimise impacts where they cannot be avoided; and/or c) mitigate impacts where they cannot be minimised. If significant adverse impacts cannot be avoided, minimised or mitigated, proposals must present a clear and convincing case for proceeding. Opportunities to enhance historic assets are encouraged.	A review of known wreck sites relative to the survey areas has been included in this report, and no known wrecks or archaeological sites have been found.
ENV_01	**Resilient Marine Ecosystems** Proposals should demonstrate how potential impacts on marine ecosystems have been taken into consideration and should, in order of preference: a) avoid adverse impacts; and/or b) minimise impacts where they cannot be avoided; and/or c) mitigate impacts where they cannot be minimised. If significant adverse impacts cannot be avoided, minimised or mitigated, proposals must present a clear and convincing case for proceeding. Proposals that contribute to the protection, restoration and/or enhancement of marine ecosystems are encouraged.	The Project will contribute to the marine ecosystem by boosting and restoring wild native oyster habitats through the various ecosystem services these habitats provide, such as increased water clarity and improved water quality, as well as enhanced biodiversity and fish production.

Policy Ref.	Policy text	Relevance to proposed project
ENV_02	**MPAs** Proposals should demonstrate how they: avoid adverse impacts on individual Marine Protected Areas (MPAs) and the coherence of the network as a whole; have regard to the measures to manage MPAs; and avoid adverse impacts on designated sites that are not part of the MPA network.	A HRA has been undertaken to assess potential impacts on designated sites. No Likely Significant Effects (LSE) have been identified in relation to the project.
ENV_03	**Invasive Non-native Species** Proposals should demonstrate how they avoid or minimise the risk of introducing and spreading invasive non-native species. Where appropriate, proposals should include biosecurity measures to reduce the risk of introducing and spreading of invasive non-native species.	Shell cultch will be sourced from approved sites and weathered for 6 months prior to deployment to the seabed. Best practice biosecurity protocols will be followed as per the NORA Guidelines on Biosecurity (European Guidelines on Biosecurity in Native Oyster Restoration. 2020. The Zoological Society of London, UK., London, UK) The chartered vessels, including the Saint David tug vessel has been sourced locally and came out of a dry dock in May 2023, after which antifouling was carried out. The plough has been out of water for over 3 years and is additionally stored out of water when not in use, thus reducing the risk of invasive non-native species (INNS).
ENV_06	**Air and Water Quality** Proposals should demonstrate that they have considered their potential air and water quality impacts and should, in order of preference: a) avoid adverse impacts; and/or b) minimise adverse impacts where they cannot be avoided; and/or c) mitigate adverse impacts where they cannot be minimised. If significant adverse impacts cannot be avoided, minimised or mitigated, proposals must present a clear and convincing case for proceeding.	Impacts to water quality have been assessed in Section 5. No significant negative impacts were concluded as a result of the project on water quality and instead restoring native oyster habitats aims to create a net positive impact on water quality as part of the oysters natural filter feeding process.
FIS_01 a	**Fisheries (Supporting)** Proposals that support and enhance sustainable fishing activities will be supported where they contribute to the objectives of this plan. Proposals should comply with the relevant general policies and sector safeguarding policies of this plan and any other	The Project will contribute to supporting sustainable fishing activities by boosting and restoring wild native oyster habitats, which in term will provide sustainable habitat and prey resource for many

Policy Ref.	Policy text	Relevance to proposed project
	relevant considerations.	commercially important juvenile fish and invertebrate species like crab, and prawn.
FIS_01 b	**Fisheries (Supporting)** Relevant public authorities and the sector are encouraged, in liaison with other interested parties, to collaborate to understand opportunities to develop a strategic evidence base to improve understanding of opportunities for the sustainable development of fisheries in order to support the sustainable development of the fisheries sector through marine planning.	Consultation has taken place between Welsh regulators, Blue Marine, ZSL, British Marine and with Conwy harbour authorities and Conwy Mussels Company, as well as the wider local working group. Since limestone deployment additional members have been added to the local working group, including the Chair of the Welsh Fishermen's Association. Local working group meetings discussed the proposed methodology on 02 August 2023, 23 November 2023, 21 February 2024, and 09 May 2024. A meeting was also held on 08 February 2024, with Jim Evans, Chair of Welsh Fisherman's Association, to discuss the proposed re-levelling methodology.

3. Method Statement

In order to re-level peaked areas within the licensed area of cultch deployment identified from the bathymetric surveys, the preferred methodology (based on the current peak height) is to charter a small tug-type vessel to tow a plough aiming achieve a uniform reef height of a maximum of 0.5 m, as stipulated within the original MLA DEML2284. Seabed levelling using a plough is a dredging technique used in many ports and harbours and has proven itself as an efficient dredging tool. A plough is towed behind the vessel along the seabed levelling high spots and ridges, moving the material to nearby low spots. Material is relocated from one place to another along the seabed and the sediment is not raised from the surface of the water. The plough is fitted with teeth to cut into the seabed material and is very efficient in moving material over short distances. The shorter the distance, the quicker the turn round time, the more material is moved per tide. Types of material that are moved by seabed levelling are clay, sand, silt and gravel. The more cohesive the material the more power the tug will need to relocate it. The cultch material is noncohesive as it is made of limestone gravel and shell.

It is likely that the seabed levelling will be completed by chartering the 'St David' Damen Stan Tug from Holyhead Port or 'CT Barnston' Easyworker 2080 from Carmet or similar small tug-type vessel. These vessels are capable of being fitted with an A Frame to carry out seabed levelling with a plough. The vessel is fitted with deck brackets and pad eyes to enable the fitting of the A Frame and associated solid and wire stays and chains to have control of the plough and lift off seabed when manoeuvring to target designated depth and ploughing area to avoid overspill into other areas. Any turns will be made as slowly as possible and during the turn the weight on the lifting wire and the angle of heel will be monitored closely. If necessary, the engines will be stopped and the plough lifted when directly under the A frame roller until vessel is in position for another run over the target site. Vessels will be fitted with navigation system, sounders and/or use a Dredging Software and it is anticipated that the reef coordinates will be uploaded to this system to ensure that the re-levelling work remains within the existing licensed area. Furthermore, after the re-levelling works have been completed, the vessel will be able to check that all peaks have been levelled to a uniform reef height of a maximum of 0.5 m.

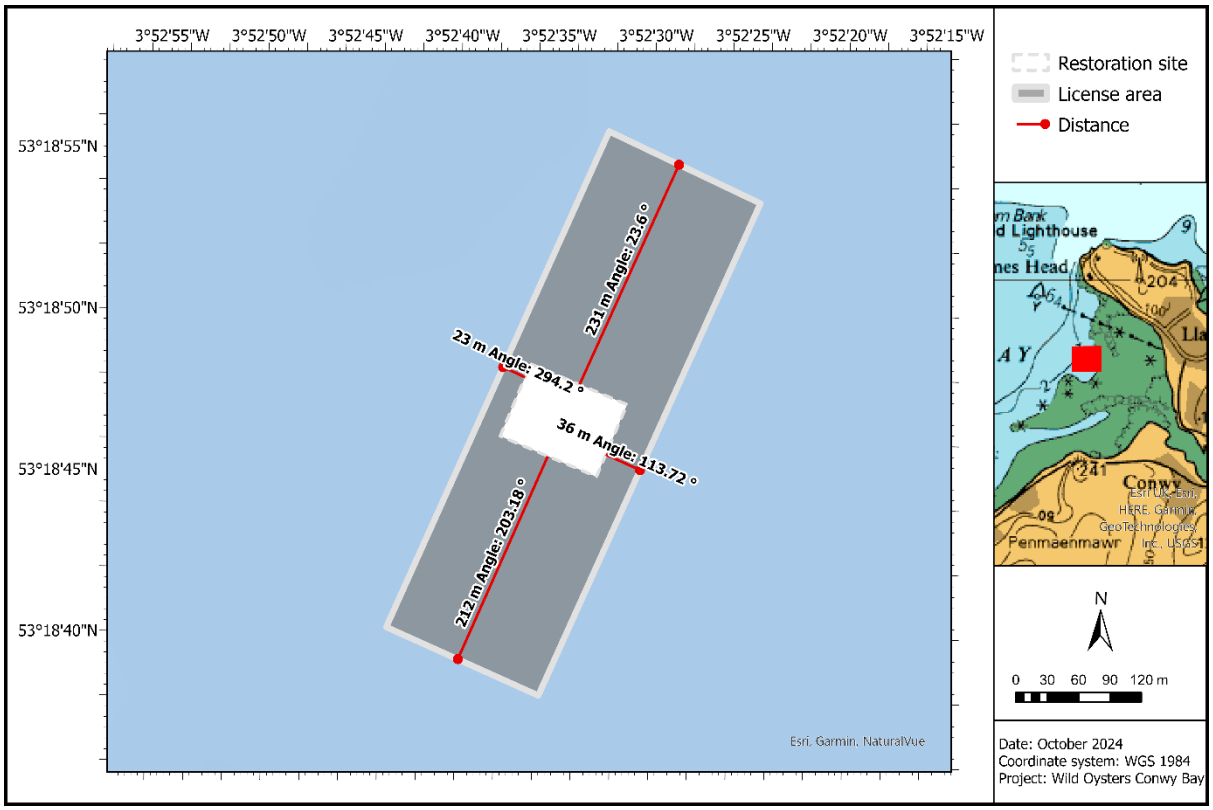
If future multibeam surveys show the peak height to have significantly reduced it may be necessary to use a more appropriate vessel proportionate to the scale of the works, like a smaller inshore vessel, such as the Conwy harbour maintenance vessel 'Jac-Y-Do' or similar type vessel, and a long reach excavator. The chartered vessel would use spud legs to hold position, targeting the peaked areas identified from bathymetric surveys using a long reach excavator arm to move the material to nearby low spots within the license area, aiming to achieve a uniform reef height of a maximum of 0.5 m, as stipulated within the original MLA DEML2284. It is anticipated that the reef coordinates will be uploaded onto the navigation system to ensure that the re-levelling work remains within the existing licensed area. Furthermore, after the re-levelling works have been completed, sounders would be able to check that all peaks have been levelled to a uniform reef height of a maximum of 0.5 m.

A multibeam survey will be conducted after shell and oyster deployment, as soon as weather permits, as part of post-reef monitoring, to assess the project footprint and reef height.

Any vessels used will follow biosecurity and pollution protocols. The chartered vessels, including the St David tug vessel, has been sourced locally and came out of a dry dock in May 2023, after which antifouling was carried out. The plough has been out of water for over three years and is additionally stored out of water when not in use, thus reducing the risk of invasive non-native species (INNS).

The restoration site is situated within the license area accounting for a buffer zone to avoid any potential overspill/natural redistribution of cultch outside of the license area presented in Figure 2.2-1.

Figure 2.2-1: Measured distance (metres) of buffer zone surrounding the restoration reef site (white box) within the license area.



3.1. Timeline

Re-levelling works for the currently identified peaks are proposed to be undertaken as soon after determination of the licence as practicably possible. However, this new MLA is seeking an active date that aligns with the existing DEML2284, i.e. up until 05 December 2029. This would allow for any potential future re-levelling works, if required, as a result of further cultch deployment within the West Bwrling licensed area of DEML2284.

The re-levelling works, and potential future re-levelling activities, are expected to be completed within 10 days (for any one event); this includes 5 days for the works, and another 5 days to allow for possible weather down time, vessel and crew availability and vessel mobilisation.

4. Consultation

Initial consultations have previously been undertaken with the NRW Marine Licensing Team to discuss options for this new MLA. Additionally, the Conwy County Borough Council Harbour Master, Matthew Forbes, is also aware of the Wild Oyster Restoration project and the peaks associated with this re-levelling project. The UK Hydrographic Office (UKHO) has been informed of the multibeam survey results and bathymetric changes, highlighting the areas which require re-levelling. In light of this information, the UKHO has updated paper charts with the Shellfish bed areas and the Electronic Navigational Charts (ENC) with the Marine Farm area, K47 in NP5012. No further updates to Notice to Mariners, in relation to the multibeam survey results, were deemed necessary by the UKHO.

Further to this, Rowland Sharp from the Marine Area Advice and Management Team at NRW, and Dylan Griffith, a Marine Enforcement Officer at the Welsh Government Marine and Fisheries Division, have also been contacted in relation to this project prior to this current MLA.

Additionally, updates on the project have been provided to the Local Working Group on a quarterly basis, including discussion of the proposed methodology. Proposed methodology was discussed at local working group meetings held on 02 August 2023, 23 November 2023, 21 February 2024, and 09 May 2024. A meeting was also held on 08 February 2024, with Jim Evans, Chair of Welsh Fisherman's Association, to discuss the proposed re-levelling methodology.

5. Environmental Impact Summary

This section identifies receptors or impact pathways that could potentially be affected by the project. Sections 5.1 to 5.11 present key environmental and social constraints in the vicinity of the proposed re-levelling area within the West Bwrling Site. Re-levelling will only take place within the West Bwrling licensed area. It is, therefore, considered that all impact pathways would remain the same for potential future re-levelling scenarios.

5.1. Physical Processes

Individual seabed re-levelling events will take up to 10 days (at any one time), and there are no anticipated impacts on physical processes from the redistribution of cultch material within the seabed restoration area.

Water depths in the area range between 1-3 m (Chart Datum); sediment in the area comprises sands, mixed sediments, and areas with coarse substrate (OEL, 2022). Therefore, given the coarser sediment type and the small scale of the re-levelling activity, up to a total of 0.08 km^2 (including the potential for future re-levelling works within the West Bwrling licensed area), it is expected that any associated sediment plumes will be small in terms of both spatial extent and elevations in turbidity. Additionally, no removal of sediments, nor excavations will occur in the area. Therefore, seabed re-levelling will not have long-term effects on physical processes, once completed, and seabed morphology will only be locally affected. There is potential for minor alteration of local seabed and sediment dynamics through very localised changes to existing sedimentation processes, extending to the area of the intervention only. Therefore, given the small scale of relevelling works (0.08 km^2), there is not anticipated to be any impact on a regional scale.

Overall, there are not considered to be any impacts on physical processes from the planned seabed re-levelling works.

The chemical properties of the sediments in this area are unknown. The potential impacts of sediment physico-chemical properties on water quality (such as increased suspended solids concentration (SSC)), are discussed in Appendix B Water Framework Directive Compliance Assessment.

5.2. Designated Sites

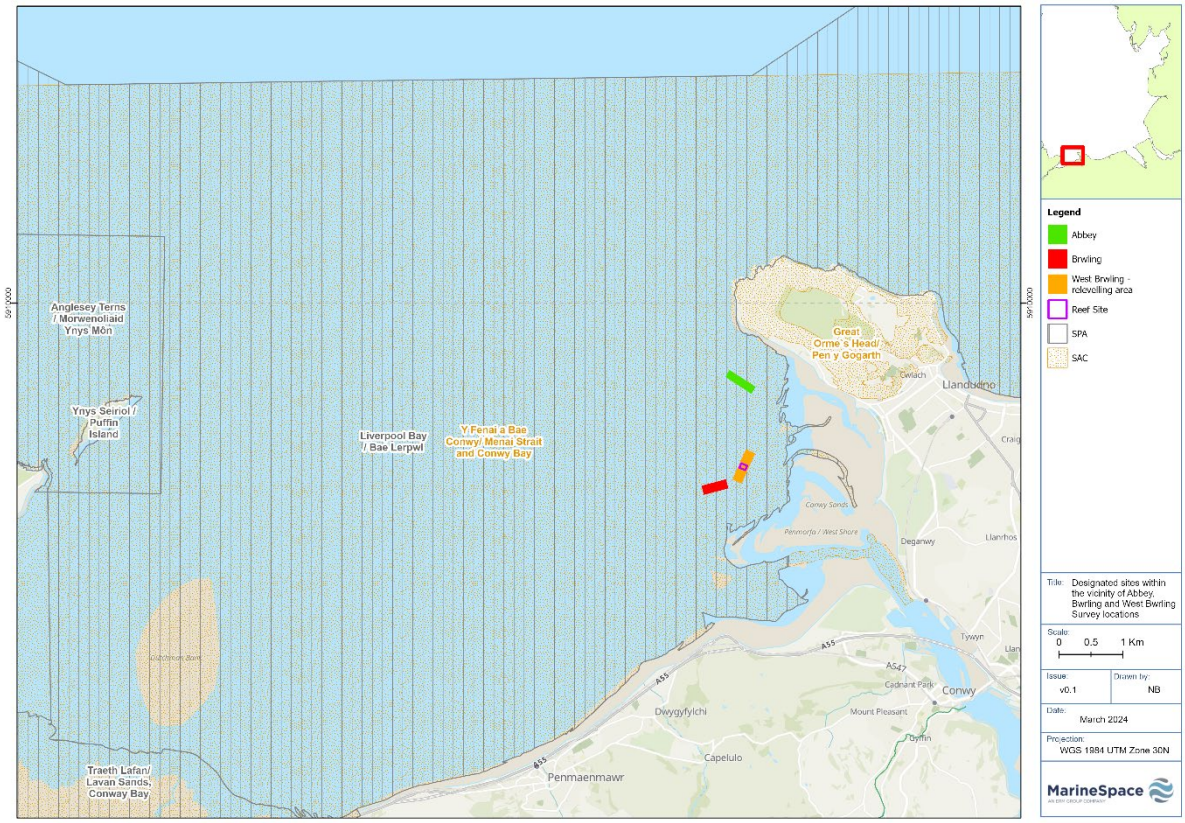
The proposed re-levelling area sits within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay Special Area of Conservation (SAC) (Figure 5.2-1). As well as these sites, the vessel will transit through the North Anglesey Marine/Gogledd Môn Forol SAC. These sites are designated for the following features:

- Sandbanks which are slightly covered by sea water all the time;
- Mudflats and sandflats not covered by seawater at low tide; and
- Reefs.

The original deposit of cultch material did not have any adverse effects on the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC. Furthermore, given the small-scale re-levelling works

(0.08 km^2) proposed, the short-term nature of the works involved, and given that re-levelling is only planned on already deployed material, not the surrounding habitat, no significant impacts are predicted to features associated with the designated sites. A separate Habitat Regulations Assessment is attached to this document, and referred to in Appendix A.

Figure 5.2-1: Designated Special Areas of Conservation (SAC) and Special Protection Areas (SPA) in relation to the Conwy Bay licence areas



5.3. Benthic Ecology

In 2022, Ocean Ecology Ltd (OEL) was contracted to provide a broadscale habitat map of the seabed habitats, to European Union Nature Information System (EUNIS) Level 3, through interpretation of geophysical data, alongside analysis of environmental data (drop-down video) to identify Annex I habitats, as part of initial site investigations for the original MLA. The survey work was conducted by Bangor University and data were analysed by OEL. The results of these surveys are presented in Figure 5.3-1, and show the EUNIS Classifications. The primary classifications found across the survey areas were:

- Moderate energy infralittoral rock;
- Moderate energy circalittoral rock;
- Subtidal Sand;
- Subtidal Mud;
- Subtidal Mixed Sediments; and
- Subtidal Macrophyte Dominated Sediment.

As presented in Figure 5.3-1, the original OEL survey areas cover a variety of seabed sediments, including sands and mixed sediments, as well as areas of mixed sediment and hard substrate. Subtidal sands and gravels (EUNIS habitat 'Sublittoral mixed sediment' (A5.4)) are considered to be the major component of the sediments which require re-levelling; however, this habitat was often not distinguishable from 'Atlantic and Mediterranean moderate energy infralittoral rock' (A3.2) or 'Atlantic and Mediterranean moderate energy circalittoral rock' (A4.2). The A3.2 and A4.2 habitats may represent Annex I reef within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC. The reef site which requires re-levelling is located within the West Bwrling area (southeastern-most site, Figure 5.3-1), which is predominantly identified as EUNIS habitat 'Sublittoral mixed sediment' (A5.4).

No potential Annex I biogenic or bedrock reefs were identified through the survey areas but potential Annex I stony reef was identified by OEL during the seabed habitat scoping survey. Some stations met criteria for low resemblance stony reef and medium resemblance stony reef. These data were shared with NRW. The areas licensed within DEML2284, were selected to avoid areas of medium resemblance stony reef, as observed in Figure 5.3-2, which shows the habitat scoping areas and the Conwy Bay licensed areas (DEML2284).

Given the small scale of seabed re-levelling works (0.08 km^2), and that the project will avoid and not overlap with areas of potential Annex I medium resemblance stony reef, as re-levelling is only planned on already deployed material, not the surrounding habitat, no significant impacts are predicted.

Figure 5.3-1: EUNIS (European Union Nature Information System) Level 3 habitat map based on geophysical and imagery data (From: OEL, 2022)

Figure 5.3-2: Habitat mapping showing multibeam, grab sample locations, habitat scoping areas, and Conwy Bay licensed areas (From: OEL, 2022)

5.4. Fish and Shellfish

The Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC, in which the proposed re-levelling area is located, is not designated for any fish or shellfish species. The proposed re-levelling area is, however, located within areas of known spawning and nursery grounds for those species identified in Table 5.4-1. Additionally, Appendix C provides an overview of the spawning and nursery grounds in the region.

The licensed areas are also located within a legislated area for the Conwy Bay and Estuary blue mussel fishery, although the re-levelling site does not directly overlap any existing mussel beds.

Table 5.4-1: Summary of fish and shellfish spawning and nursery grounds which overlap with the Conwy Bay Site

Species	Spawning	Nursery
Sole *Solea solea*	Yes	Yes
Whiting *Merlangius merlangus*	Yes	Yes

Species	Spawning	Nursery
Thornback ray *Raja clavata*	No	Yes
Sprat	Yes	No
Cod *Gadus morhua*	Yes	Yes
Mackerel *Scomber scombrus*	Yes	No
Plaice *Pleuronectes platessa*	Yes	Yes
Sandeel *genus Hyperoplus*	Yes	Yes

Seabed re-levelling may directly impact fish and shellfish through the risk of smothering, alteration of existing habitat type, and loss of habitat. Alteration of habitat type may also indirectly impact fish and shellfish species through loss of prey and food species. However, given the very small scale of seabed re-levelling works (0.08 km^2), the short-term duration (up to 10 days maximum per re-levelling event), and given that re-levelling is only planed on already deployed material, not the surrounding habitat, no significant impacts are predicted.

5.5. Ornithology

The proposed re-levelling area is located within the Liverpool Bay Special Protection Area (SPA) (Figure 5.2-1), designated for the features presented in Table 5.5-1.

Table 5.5-1: Designated features of the Liverpool Bay SPA

Feature	Feature Type	% of population	Conservation Objective
Red-throated diver *Gavia stellata* (in non-breeding season)	Annex I species	6.89% of GB	Maintain or Restore
Little gull *Hydrocoloeus minutus* (in non-breeding season)	Annex I species	N/A	Maintain or Restore
Common scoter *Melanitta nigra* (in non-breeding season)	Regularly occurring migratory species	10.31% of NW European	Maintain or Restore
Waterbird assemblage	Assemblage	N/A	Maintain or Restore
Little tern *Sternula albifrons* (in breeding season)	Annex I species	6.84% of GB	Maintain or Restore
Common tern *Sterna hirundo* (in breeding season)	Annex I species	1.80% of GB	Maintain or Restore

Individual seabed re-levelling works will take up to a maximum of 10 days (for any one event) to complete and, given the works will be completed at the seabed, there is anticipated to be no impacts on marine birds.

Once re-levelled it is considered that there will be no interaction with marine birds and, therefore, no significant impacts are predicted.

5.6. Marine Mammals

The re-levelling area is located in the Menai Strait and Conwy Bay SAC (Figure 5.2-1), of which marine mammals are not a designated feature. However, the Welsh Marine Planning Portal (Welsh Marine Planning Portal, 2023) confirms the presence of bottlenose dolphin *Tursiops truncatus* and harbour porpoise *Phocoena phocoena* in the region, with a designated grey seal *Halichoerus grypus* pupping and haul out site approximately 5 km from the proposed re-levelling area.

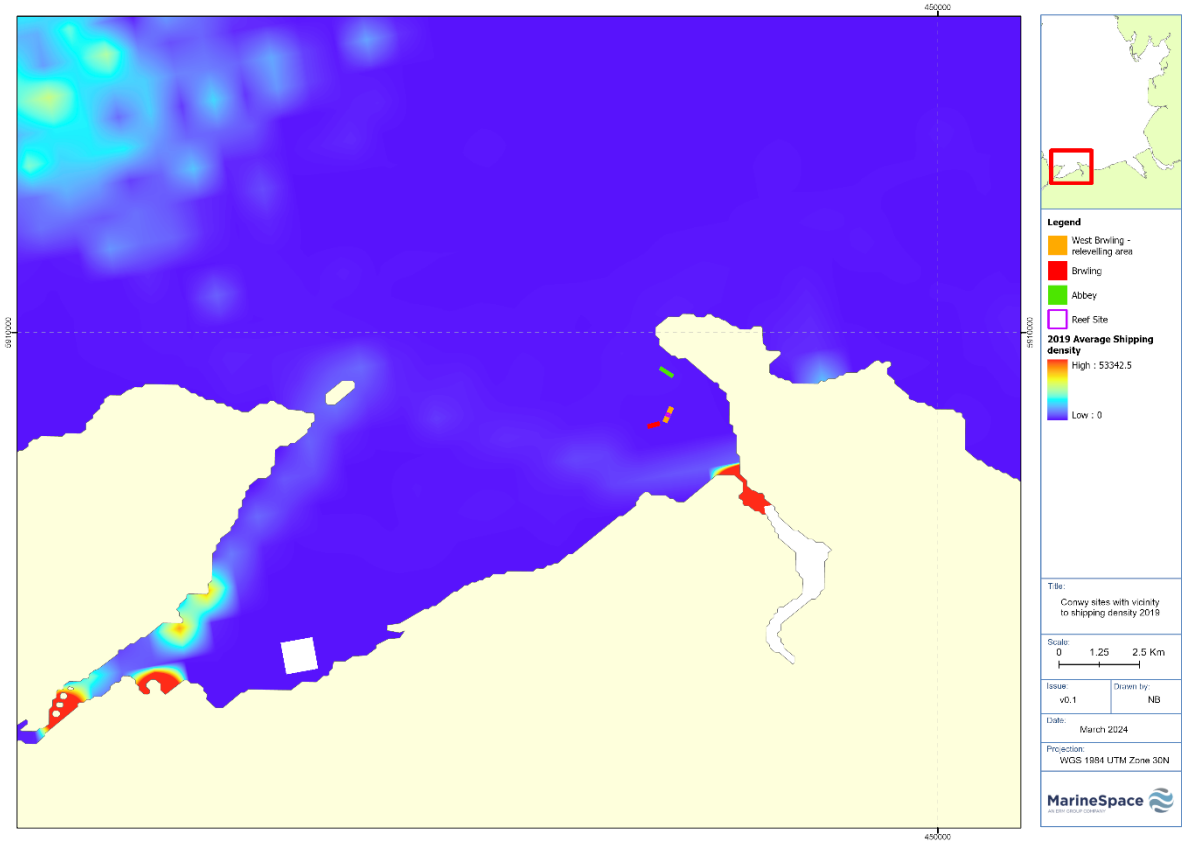
There may be some minor disturbance from the tug vessel during seabed ploughing, however given the short-term re-levelling works, and the mobile nature of marine mammals, no significant impacts are predicted.

5.7. Shipping and Navigation

Figure 5.7-1 provides an overview of the regional shipping activity, which shows areas of low shipping activity in the proposed re-levelling area, with the areas of highest shipping activity at the mouth of the river Conwy, likely due to concentrated vessel movements, setting off from, and returning to, Conwy harbour, marinas and moorings.

Seabed re-levelling will be temporary and take up to a maximum of 10 days (for any single event. The licence areas are outside of the Conwy river channel, and the Harbour Master has confirmed the peaks pose no interaction with shipping activities and, thus, there is no risk to navigation. Therefore, it is considered that impacts on shipping and navigation during these works will be minimal. Once the peaks have been re-levelled there will be no interaction with shipping and navigation, and also no reduction in water depth sufficient to create any impacts. Therefore, no significant impacts are predicted.

Figure 5.7-1: Average shipping vessel density and activity relative to the Conwy Bay licensed areas (EMODnet, 2019a)



5.8. Commercial Fisheries

Figure 5.8-1 and Figure 5.8-2 provide an overview of the static and mobile fishing activity in the region surrounding the proposed re-levelling area, where each cell represents an area 189.51 m by 189.51 m. The data presented in Figure 5.8-1 and Figure 5.8-2 are Vessel Monitoring System (VMS) data obtained from the Welsh Government (2019); geo-referenced from: Welsh Government, 2019. Welsh National Marine Plan. FIS_01: Fisheries (supporting) – Vessel Monitoring System Data. Available online at: https://www.gov.wales/sites/default/files/publications/2019-11/welsh-national-marine-plan-document_0.pdf.

The VMS data obtained from the Welsh government (2019) are used to form the baseline of the assessment of fishing activity. In Figure 5.8-1 and Figure 5.8-2, fishing activity is presented relative to a given year (2019), as fishing activity is variable. The high-medium-low bands (or colour coded ranges in our case) of fishing activity change relative to within a given year.

The data time period presented is for one year (2019). The data source does not state vessel size included, however due to inclusion of inshore data, vessel size classes likely include under 10 m, and 12 m and over, vessels. The unit for the 'Estimated relative fishing activity' presented in Figure 5.8-1 and Figure 5.8-2 is fishing effort (kilowatt hours (kWh)).

Additionally, the most recently available VMS data have been obtained from the Marine Management Organisation (MMO), 2020. These data highlight the most up to date information available for vessels over 15 m and are presented in Figure 5.8-3. This illustrates vessels over 15 m, fishing within the 12 nm limit during 2020, to spend between approximately 0-60 hours fishing.

It is noted that smaller inshore vessels are largely under-represented by VMS data. A request was made to the Welsh Government Marine and Fisheries Division for inshore VMS (iVMS) data, which include vessels under 12 m, but the data could not be shared. Lack of regular systematic data reporting for the inshore region, and restrictions on disclosing fishing activities, particularly in relation to smaller inshore vessels, remains an obstacle.

Based on the data that were available, the figures show the proposed re-levelling area to be located in a region of low mobile fishing activity, with some areas of higher static fishing; however, overall, the fishing activity seems to be low, relative to areas further offshore (although inshore fishing vessel data could not be obtained to be incorporated in the assessment of the static and mobile fishing activity in the region surrounding the proposed re-levelling area). Individual seabed re-levelling events will be temporary and take up to a maximum of 10 days to complete (for any single event); therefore, it is considered that impacts on commercial fisheries during the re-levelling works, will be minimal. Once re-levelled the cultch will be largely permanent and immobile, although there is some potential for risk of translocation during severe storm events. Despite this, any potential translocation of material will be low and not above background levels of sediment/seabed dispersion during storm events, as such no significant impacts are predicted using the data that was available for this assessment. Unfortunately, the publicly available fishing data are limited for recent years (2020 onwards) and fishing activity for the full fishing fleet could not be assessed, because iVMS data could not be shared by Welsh Government at the time.

From personal communications with fishers involved in the project's local working group, it is understood that some fishing from smaller vessels does take place in the region surrounding the proposed re-levelling area. However, an assessment of static and mobile fishing activity in the region surrounding the proposed re-levelling area could only be completed using the available data (Welsh Government, 2019; MMO, 2020). We have presented the proposed levelling methodology to the local working group and discussed with the chair of the Welsh Fishermen's Association.

NRW Marine Licensing and Welsh Government Marine and Fisheries Division have been contacted about this. NRW Marine Licensing have confirmed that they will be consulting directly with Welsh Government Marine and Fisheries Division, and other fisheries consultees, as part of the determination of the application. Welsh Government Marine and Fisheries Division has confirmed that a representative of Welsh Government will comment on the Marine Licence, when submitted, taking into account the potential impact of the work on local fisheries.

Figure 5.8-1: Vessel Monitoring System (VMS) data obtained from the Welsh Government showing the estimated mobile fishing activity (kilowatt hours (kWh)) relative to a given year (2019). The data source does not state vessel size included, however due to inclusion of inshore data, vessel size classes likely include under 10 m, and 12 m and over, vessels. Each cell in the figure represents an area of 189.51 m by 189.51 m

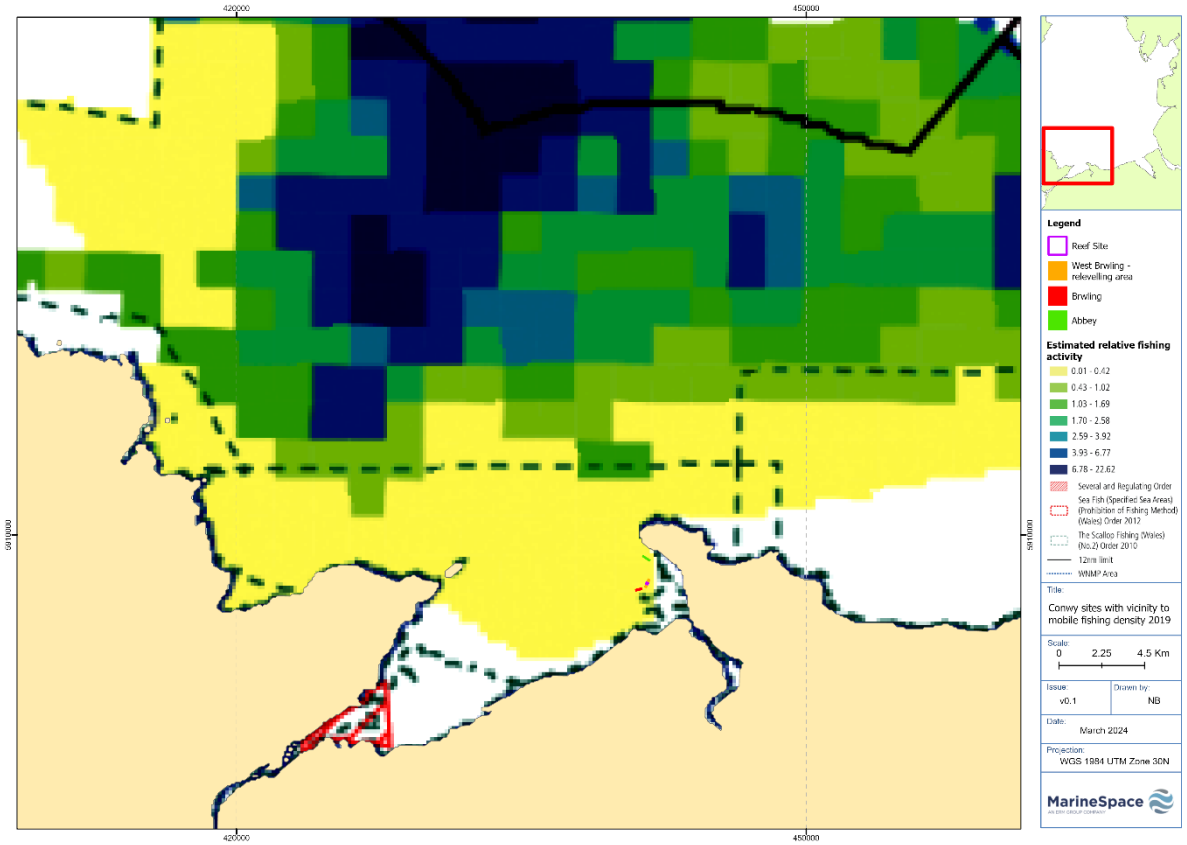


Figure 5.8-2: Vessel Monitoring System (VMS) data obtained from the Welsh Government showing the estimated static fishing activity (kilowatt hours (kWh)) relative to a given year (2019). The data source does not state vessel size included, however due to inclusion of inshore data, vessel size classes likely include under 10 m, and 12 m and over, vessels. Each cell in the figure represents an area of 189.51 m by 189.51 m

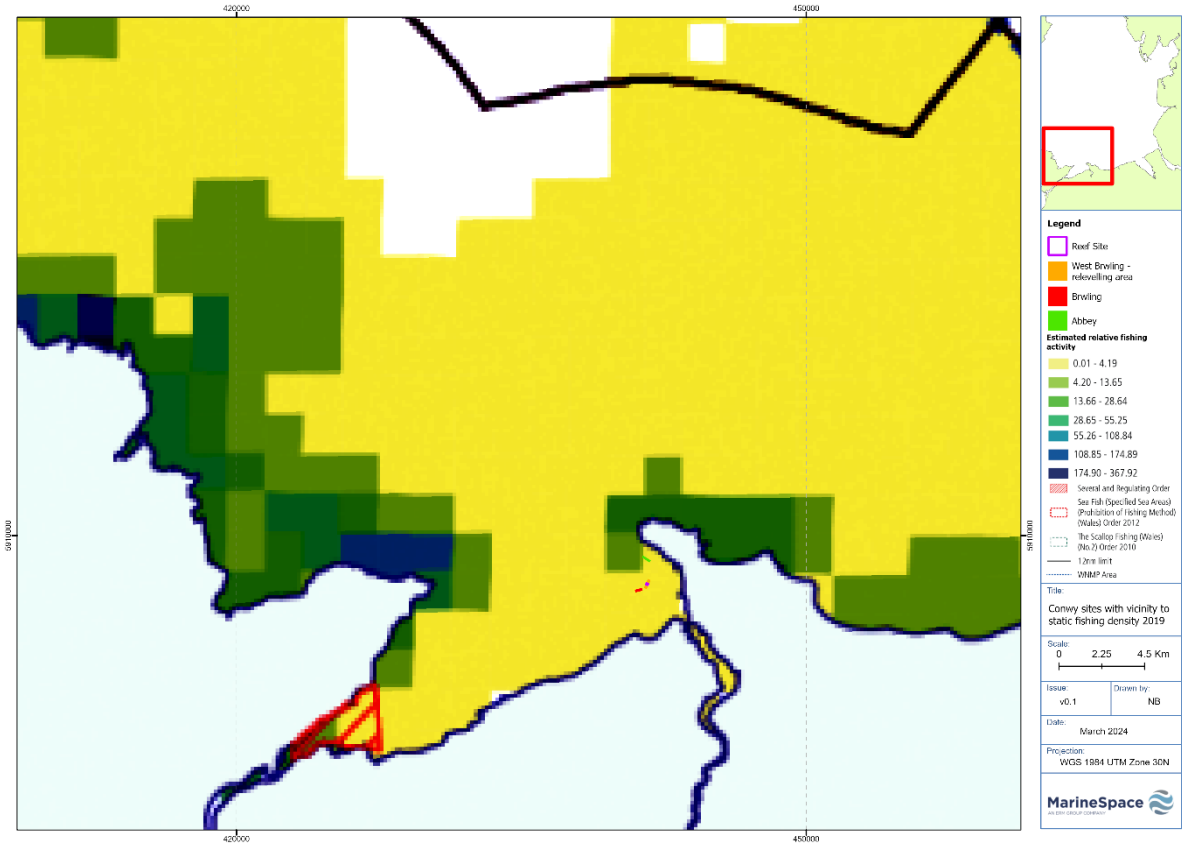
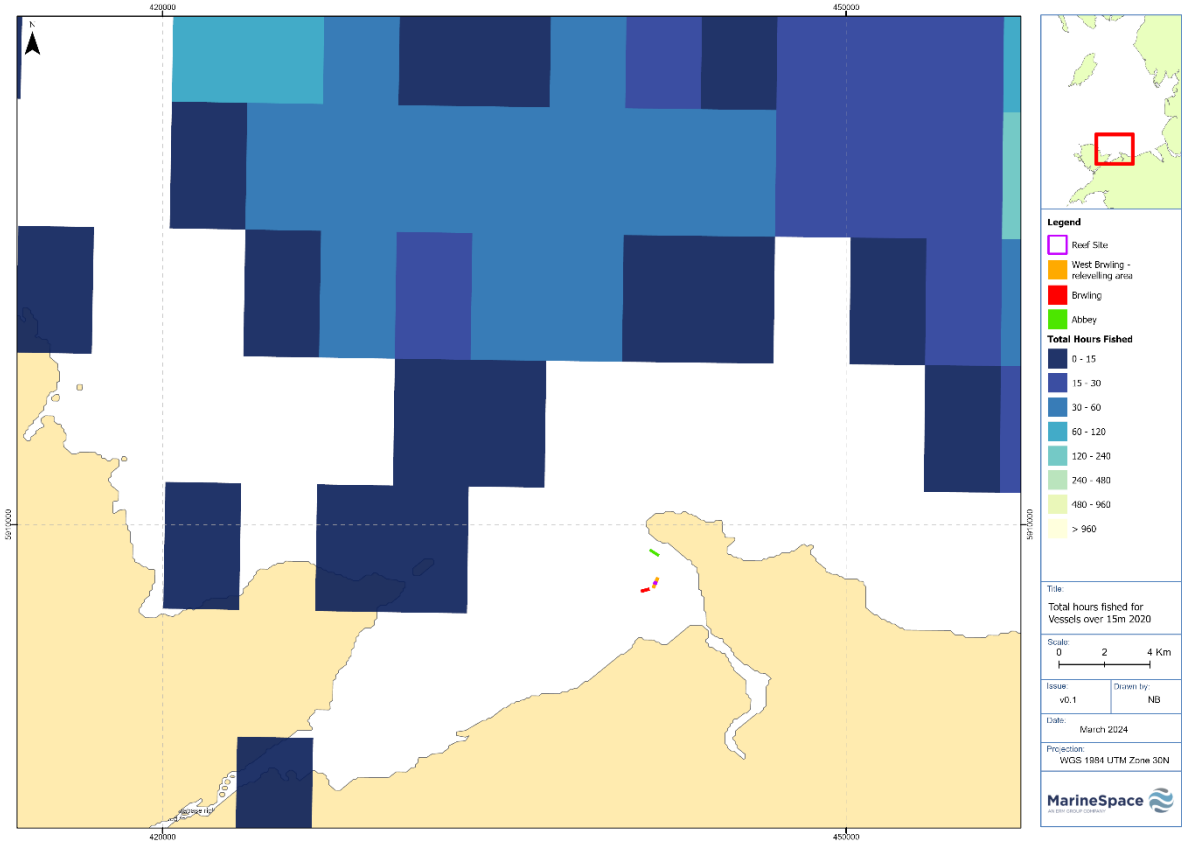


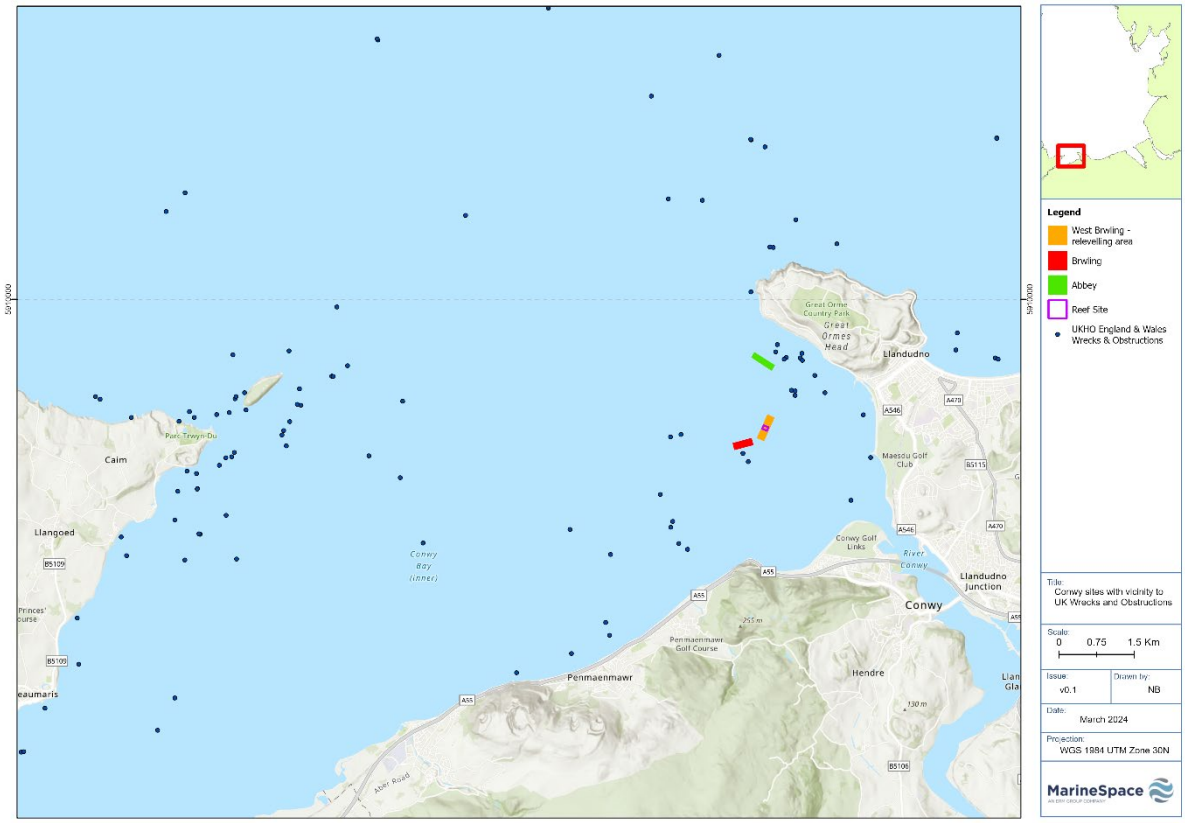
Figure 5.8-3: Vessel Monitoring System (VMS) data showing the total hours fished by vessels over 15 m during 2020, obtained from the MMO. Each cell in the figure represents an area of 18.15 km^2



5.9. Marine Archaeology and Cultural Heritage

No known wrecks are present within the proposed re-levelling area highlighted within the West Bwrling Site, detailed in orange in Figure 5.9-1. Additionally, no known wrecks are located within the other licensed areas of the Conwy Bay site. It is anticipated, therefore, that there will be no impacts on marine archaeology and cultural heritage, either via the actual re-levelling works themselves, or once the works have been completed.

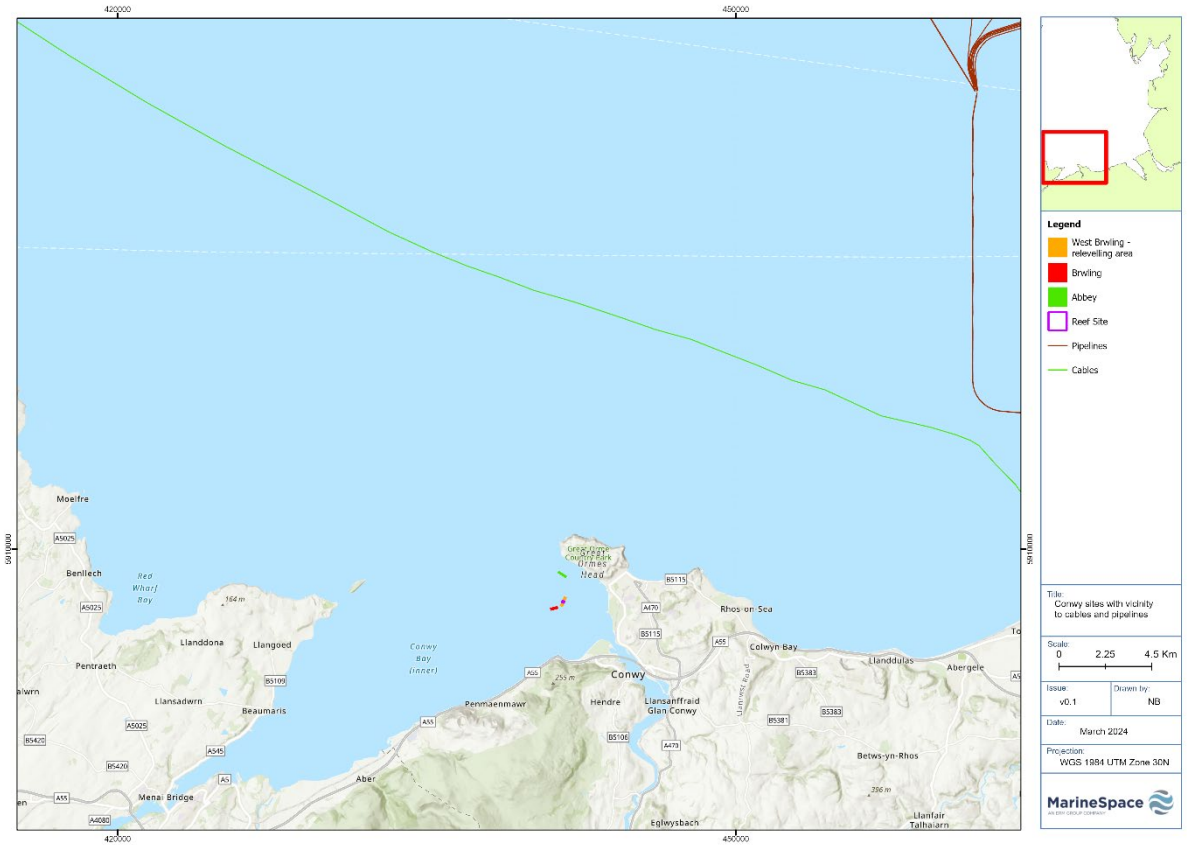
Figure 5.9-1: Known wrecks or obstruction locations relative to the Conwy Bay licensed areas from the UK Hydrographic Office wrecks and obstructions database (2015 and 2024)



5.10. Marine Infrastructure

As presented in Figure 5.10-1, there are no existing cables or pipelines within 10 km of the potential re-levelling area and, as such, no impacts will result from the re-levelling works on existing marine infrastructure and/or after the works have been completed. Individual seabed re-levelling events will be temporary, and take up to a maximum of 10 days to complete (for any single event, including weather downtime); therefore, no significant impacts are predicted for recreational receptors, such as angling, water sports and diving, as these activities are considered to operate within a wide spatial area.

Figure 5.10-1: Location of subsea cables, obtained from KIS-ORCA (2024), and pipeline locations, from EMODnet (2019b) relative to the Conwy Bay licensed areas



5.11. Water Framework Directive

The Water Environment (Water Framework Directive (WFD)) (England and Wales) Regulations 2017 are designed to prevent deterioration of the water environment and improve water quality. A separate WFD scoping and assessment has been conducted - see Appendix B. Following consideration of the project's mitigation, including a biosecurity plan, no impacts were identified on any WFD waterbody and the proposed cultch re-levelling plan is considered WFD compliant.

6. Conclusion

The SID provides the following:

- An overview of the project and the associated project activities; and
- A summary of the potential environmental impacts resulting from the project by highlighting potential receptors and impact pathways.

It has been concluded that no potential impacts will arise from the project, this is supported by the Habitats Regulations Assessment (HRA) and WFD Assessments conducted (refer to Appendix A, Appendix B and Appendix C). This report will be submitted to support a new MLA to NRW.

7. References

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Appendices

Appendix A – Habitat Regulations Assessment

Appendix B – Water Framework Directive Assessment

Appendix C – An Overview of Fish and Shellfish Spawning Areas

Appendix A. Habitat Regulations Assessment

Refer to Appendix A attached.

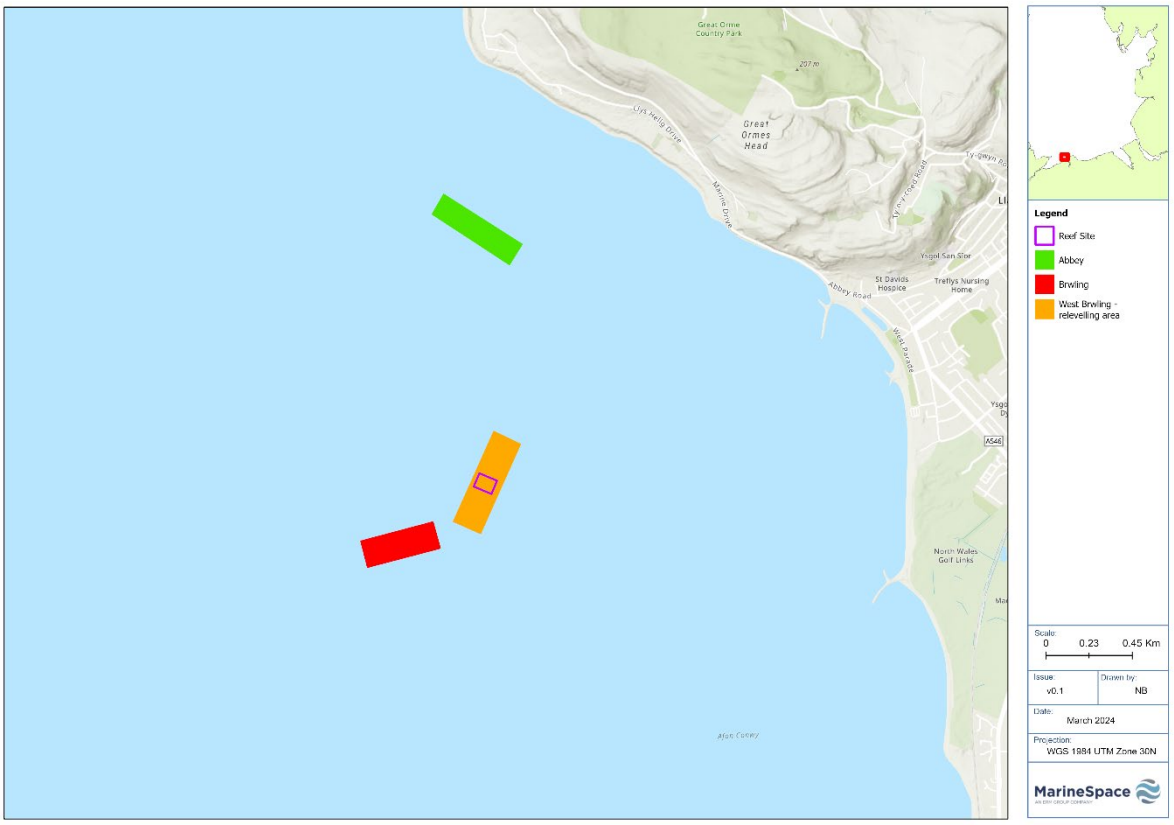
Appendix B. Water Framework Directive Assessment

1. Introduction

This Water Framework Directive (WFD) assessment has been produced by MarineSpace Ltd (MarineSpace) on behalf of the client, the Zoological Society of London (ZSL), to accompany a Marine Licence Application (MLA) to Natural Resources Wales (NRW) for substrate re-levelling in the Conwy Bay reef site.

Following the deposition of cultch material under existing marine licence DEML2284 between 08-21 June 2023, a bathymetric survey was undertaken as soon as weather conditions allowed, on 06 July 2023. Results of the bathymetric survey revealed several raised areas to be present within the licensed area, which now require re-levelling, an activity separately licensable by NRW under the Marine and Coastal Access Act 2009 and, therefore, part of a new MLA Figure B 1-1.

Figure B 1-1: Location of the Conwy Bay licensed areas and reef site which requires re-levelling



The bathymetric survey data obtained on 06 July 2023 have identified 3 peaks of 2 m in height and approximately 5 smaller peaks of 1 m in height within the Conwy Bay site. Seabed elevations >0.5 m are illustrated within Figure B 1-2, Figure B 1-3 and Figure B 1-4. This highlights the three large peaks that transect just south of the centre of the reef site and several smaller peaks which are scattered throughout the reef deployment site. Additional multibeam surveys were conducted on 16 November 2023, and 03 May 2024, as part of post-deployment monitoring. The limestone gravel

remained in the reef site within West Bwrling licence area, and a natural redistribution of the limestone gravel is indicated, as maximum peak height has reduced, displayed in Figure B 1-3 and Figure B 1-4.

Figure B 1-2: Bathymetric survey results after limestone gravel deployment highlighting the difference in seabed elevation >0.5 m (March 2022-July 2023), maximum peak height 2.08 m

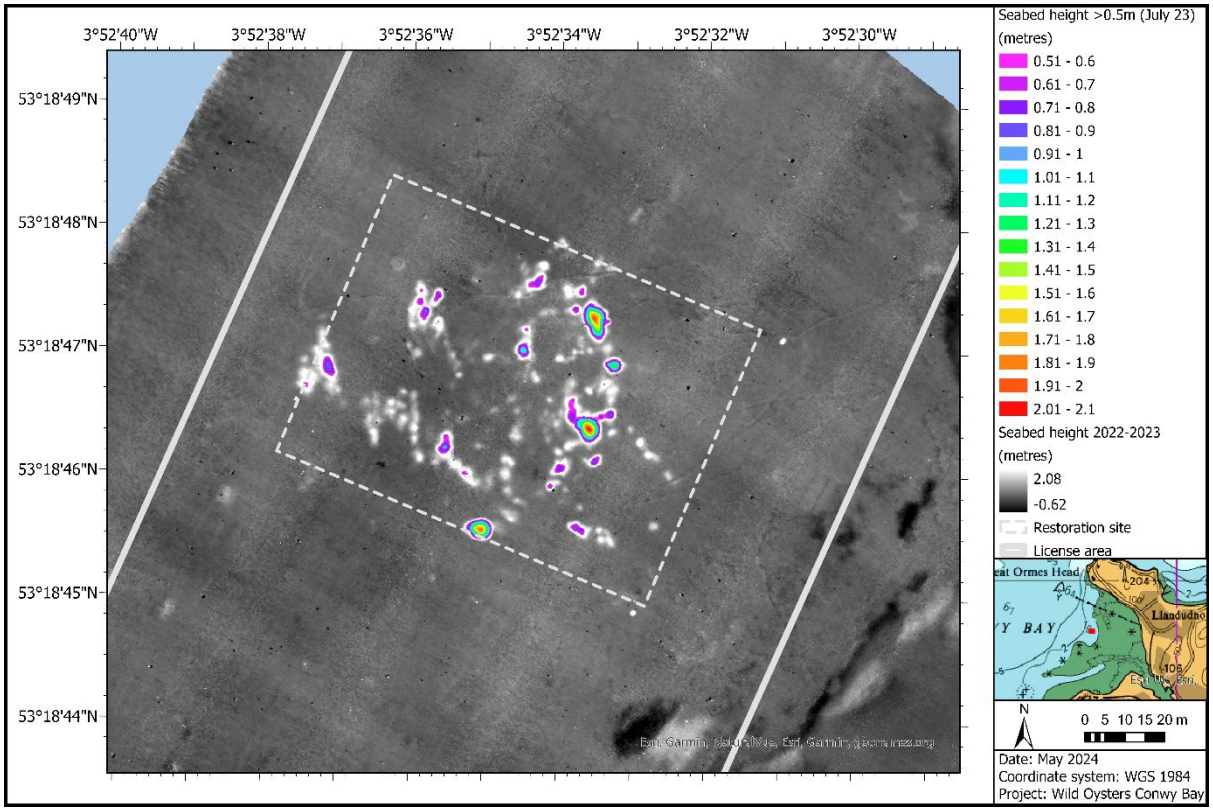


Figure B 1-3: Bathymetric survey results which highlight the difference in seabed elevation (March 2022-November 2023), maximum peak height 1.42 m

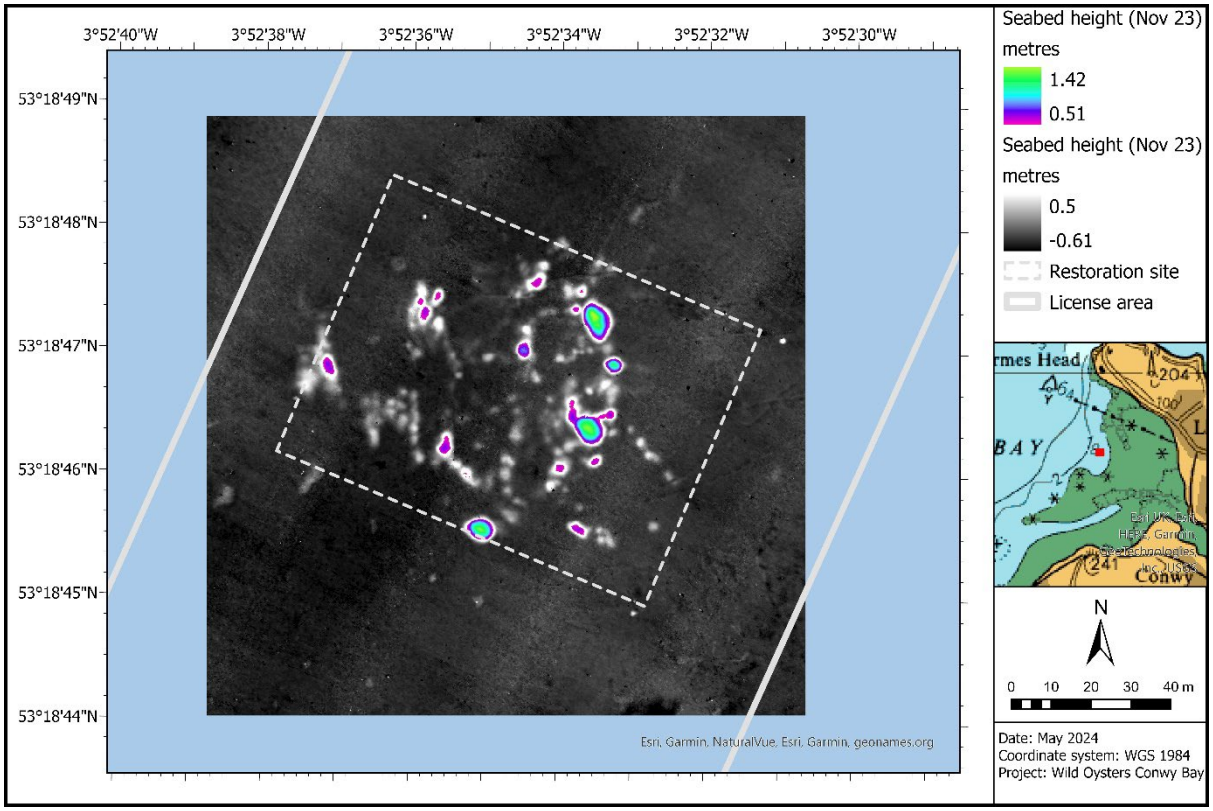
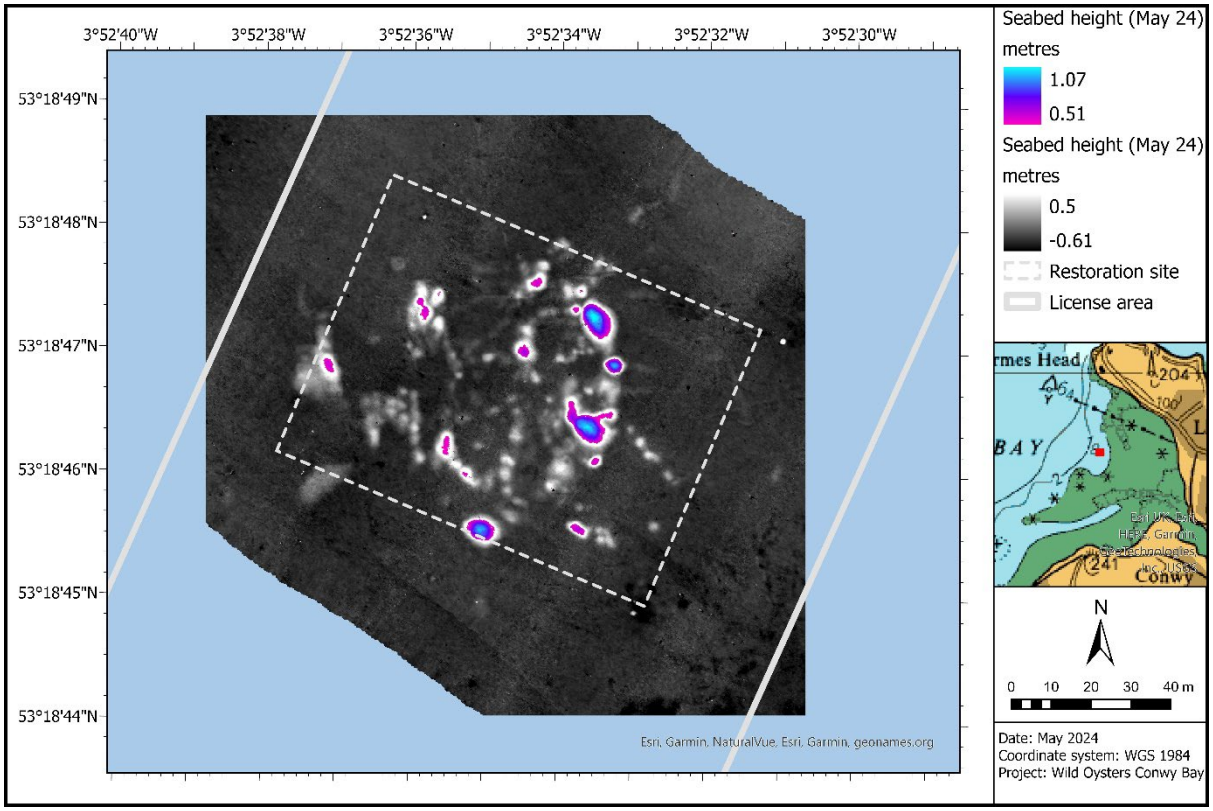


Figure B 1-4: Bathymetric survey results which highlight the difference in seabed elevation (March 2022 – May 2024), maximum peak height 1.07 m.



Re-levelling works will involve dredging of the seabed; however, it should be noted that no sediment will be removed, only redistributed within the West Bwrling licensed area, up to a maximum height of 50 cm above the seabed, as per the Supporting Information Document (SID) for MLA DEML2284. The following project activities are deemed to be licensable by NRW, under the Marine and Coastal Access Act 2009:

- Carry out any form of dredging, whether or not involving the removal of any material from the sea or seabed (Band 2).

A marine licence is, therefore, required. This report details the background of the project, provides additional information about the project, and details the project location and timeline.

As part of the application process, the proposed sites located in transitional and coastal waters within the 1 nm boundary need to undergo WFD assessment. The site lies within the 1 nm boundary and, therefore, a WFD assessment is required for those locations.

Background information regarding the project and its location can be found in Section 1.2 and 1.3 of the main SID.

2. Associated Legislation

2.1. The Water Framework Directive

The EU Water Framework Directive 2000/60/EC is transposed into law in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, as amended by The Floods and Water (Amendment *etc*.) (EU Exit) Regulations 2019. The Regulations mean that the requirements of the WFD need to be considered at all stages of the planning and development process, which may impact on water bodies.

The Regulations require all UK waterbodies to achieve Good Ecological Status (GES) or Good Ecological Potential (GEP) by 2027, with interim targets in 2015 and 2021. They also require that environmental objectives be set for all waterbodies to either maintain 'good status', or to move towards 'good status' if a waterbody is currently failing its target. Under all conditions, it requires that there should be no deterioration in status.

Waterbody classification is based on two separate categories: ecological and chemical. For a waterbody to be in overall 'good' status, both ecological and chemical status must be at least 'good'. The ecological status of surface waters is classified using information on the biological, physio chemical and hydromorphological quality of the body of water.

Ecological status is recorded on the scale of 'high', 'good', 'moderate', 'poor' or 'bad'. 'High' denotes largely undisturbed conditions and the other classes represent increasing deviation from this natural condition, otherwise described as a 'reference condition'. Classification under the WFD is determined in accordance with the 'one out, all out' principle, meaning that the worst assessment result for a biological quality element determines the overall assessment result. This means that the condition of a single quality element can cause a waterbody to fail to reach its overall WFD classification objectives.

Chemical status is assessed by compliance with environmental standards for chemicals that are listed in the EC Environmental Quality Standards Directive (2008/105/EC). These chemicals include priority substances, priority hazardous substances, and eight other pollutants carried over from the Dangerous Substance Daughter Directives. Chemical status is recorded as 'good' or 'fail'. The chemical status classification for the waterbody is determined by the worst scoring chemical.

The WFD seeks to reduce Priority Substances (20 are Priority Substances and 13 are Priority Hazardous Substances = 33 in total) in the marine environment, through the use of the Environmental Quality Standards Directive (EQSD) 2008/105/EC for discharges and outfalls. In addition, a further 8 pollutants fall under the scope of Directive 86/280/EEC, and are included in List I of the Annex to Directive 76/464/EEC, but are not in the priority substances list. Environmental quality standards for these substances are, however, included in the Environmental Quality Standards Directive.

Due to changes in the methodology (in which ubiquitous Persistent, Bio-accumulative and Toxic (uPBT) substances are one of the new surface water chemical substances included for assessment), and with the introduction of new surface water chemical substances assessed, all water bodies in

England and Wales now fail chemical status, and the assessments are not comparable to previous years' assessments. The four groups of global pollutants known as uPBTs, causing the significant change in chemical classification are:

- Polybrominated diphenyl ethers (PBDEs - a group of brominated flame retardants);
- Mercury and its compounds;
- Certain Polycyclic aromatic hydrocarbons (PAHs); and
- Perfluorooctane sulfonate (PFOS), a group of per-and polyfluoroalkyl substances (PFAS) which is being assessed for the first time (EA 2022).

If uPBTs are included, chemical status assessment is not comparable to previous years' assessments; and if uPBTs are omitted, the chemical status assessment is comparable to previous years' assessments.

Where the hydromorphology of a surface waterbody has been significantly altered for anthropogenic purposes, it can be designated as an Artificial or Heavily Modified Waterbody (A/HMWB). An alternative environmental objective, Good Environmental Potential (GEP) applies in these cases.

River Basin Management Plans (RBMPs), developed for each River Basin District (RBD), set out the current status classification of all waterbodies, as well as the objectives and actions required to maintain or improve the current Status of each waterbody.

2.2. Shellfish Waters Directive

The WFD has repealed 'Directive 2006/113/EC of the European Parliament and of the Council of 12 December 2006 on the Quality Required of Shellfish Waters', also known as the Shellfish Waters Directive. This Directive was in place to protect and improve water quality and support the growth of healthy shellfish (bivalve and gastropod molluscs) and contribute to good quality edible shellfish. These requirements are now included within the WFD.

The Shellfish Waters Directive established parameters applicable to designated shellfish waters, as well as indicative values, mandatory values, reference methods of analysis, and the minimum frequency for taking samples and measurements. These parameters are set for pH, temperature, salinity and the presence or concentration of certain substances (dissolved oxygen, hydrocarbons, metals, organohalogenated substances *etc*.).

The competent authorities for each Member State (in this case, NRW) must take samples from the waters to verify their conformity with the criteria set by the Directive. The following proportions of samples must conform to the established values:

- 100% of the samples for the parameters 'organohalogenated substances' and 'metals';
- 95% of the samples for the parameters 'salinity' and 'dissolved oxygen';
- 75% of the samples for the other parameters; and
- No evidence of harm to the shellfish from organohalogenated compounds.

Additionally, the Directive stipulated that a discharge should not cause increase of suspended solids to exceed 30% above background levels, as shellfish can be adversely affected by the smothering effects of sediment settling.

2.3. The Bathing Waters Directive

The Bathing Waters Directive 2006/7/EC is implemented through the Bathing Waters Regulations 2013, as amended by The Floods and Water (Amendment *etc*.) (EU Exit) Regulations 2019. This requires that bathing waters are monitored every year, and the monitoring calendar should provide for at least 4 samples to be taken per season (except where the season is very short or where there are special geographic constraints). The sampling interval should not be longer than 1 month. From the point that 4 years of monitoring results are available, assessment of bathing waters should be completed at the end of every season. A shorter period may be acceptable in some cases.

NRW assesses bathing water quality at each designated bathing water site in Wales throughout the season from 15 May to 30 September.

The Bathing Waters Directive was introduced to ensure that EU Member States identify popular bathing areas and monitor bathing waters for indicators of microbiological and chemical pollution throughout the bathing season. In total, there were originally 19 quality parameters, both microbiological and physio-chemical. However, under the revised Bathing Waters Directive, more stringent water quality standards have been set, and a stronger emphasis placed on beach management. The bacterial parameters mentioned above have been replaced by tests for:

- *Escherichia coli*; and
- Intestinal enterococci.

The Bathing Waters Directive also requires that:

- When the bathing water profile indicates a potential for cyanobacterial proliferation, appropriate monitoring shall be carried out to enable timely identification of health risks;
- When the bathing water profile indicates a tendency for proliferation of macro-algae and/or marine phytoplankton, investigations shall be undertaken to determine their acceptability and health risks and adequate management measures shall be taken, including information to the public; and
- Visual inspections for waste, including tarry residues, glass, plastic or rubber must also be carried out.

2.4. Environmental Quality Standards Directive

The Environmental Quality Standards Directive (EQSD) (2008/105/EC) outlines concentration limits for water quality parameters for 20 priority substances and 13 priority hazardous substances. Exceedance of the limits could result in a deterioration of the water quality and potentially the WFD status.

The aim of the WFD, as stated in WFD Article 1(c), is to "*cease or phase out discharges, emissions and losses of priority hazardous substances, with the ultimate aim of achieving concentrations in the*

marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances".

Priority hazardous substances are substances which are toxic and are persistent (do not readily break down in the water environment) and have the potential to bioaccumulate.

3. Assessment Methodology

The aim of this WFD Compliance Assessment is determine whether or not the Proposed Project activity supports the objectives set out in the local River Basin Management Plan (RBMP), to identify the potential WFD waterbodies receptors hydrologically connected to aspects of the Proposed Development and assess the potential effects of the Proposed Development on the waterbodies Ecological Status and on the WFD statutory receptors within the identified waterbodies (in compliance with the WFD).

The following section sets out the approach that will be followed, based on the following set of guidance documents:

- Advice Note 18[2]: The WFD (Planning Inspectorate, 2017), which provides an overview of the WFD and provides an outline methodology for considering WFD as part of the DCO process;
- Clearing the Waters For All (Environment Agency, 2016[3]), which provides guidance for undertaking activities within transitional and coastal waterbodies.

In accordance with these sources, assessment of all stages of the activity, including construction, operation, maintenance and decommissioning, is carried out in the following stages:

- Stage 1: Screening;
- Stage 2: Scoping; and
- Stage 3: Detailed Compliance Assessment.

[2] Planning Inspectorate (2017). Advice note 18: The water Framework Directive. Available online at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/. [Accessed November 2023].

[3] Environment Agency (2016) Water Framework Directive risk assessment: How to assess the risk of your activity [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/522426/LIT_10445.pdf [Accessed November 2023].

4. WFD Assessment

4.1. Stage 1: Screening

During this stage:

- The environmental baseline information is collated to identify WFD designated water bodies which could be impacted (Figure B 4-1 and Figure B 4-2). Under consideration are the WFD waterbodies (surface and groundwater) which are hydrologically connected to the Project site, either directly or indirectly. Indirectly connected waterbodies are those that are connected to the site investigation areas via other waterbodies e.g. downstream waterbodies; and
- The Project design is considered and the activities which could lead to potential impacts, are identified. All identified activities and components related to the Marine Infrastructure are identified and those which are not considered to cause effects to waterbody water quality are 'screened-out'. All other activities which are considered to have potential to cause effect are 'screened-in' and considered in the scoping stage.

The following sources of information informed the screening assessment:

- Environment Agency (2017) Water Framework Directive assessment guide: estuarine and coastal Waters[4];
- Environment Agency WFD scoping template[5]; and
- DataMap Wales[6];
- Water Watch Wales Map viewer[7].

The proposed project is composed of a single phase, of which the main activity comprises the re-levelling of the substrate and area where the cultch was deployed. The key aspects of the re-levelling activity include:

- Dredging of the seabed at the elevated points identified from the multibeam survey data;

[4] Environment Agency (2017) Water Framework Directive assessment: estuarine and coastal waters [Online] Available at: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters. [Accessed: November 2023].

[5] Environment Agency, Water Framework Directive assessment: estuarine and coastal waters Scoping Template. Available online at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fassets.publishing.service.gov.uk%2Fmedia%2F5a7f3831e5274a2e8ab4ad9b%2Fwfd_scoping_template.odt&wdOrigin=BROWSELINK.

[6] DataMap Wales (2023). Available online at: https://datamap.gov.wales/maps/new?layer=geonode:nrw_wfd_cycle_3_classifications#/. [Accessed November 2023].

[7] Water Watch Wales map viewer (2023). Available online at: https://waterwatchwales.naturalresourceswales.gov.uk/en/. [Accessed November 2023].

- Redistribution of material and substrate into the surrounding licensed area (no material or sediments will be permanently removed from the seabed).

The Proposed Development does not meet the criteria for activities exempt WFD assessment. As such, the project is taken forward to Stage 2 (Scoping).

The waterbodies considered in this assessment are:

- Conwy Bay Coastal Water Body GB671010400000 – HMWB, Moderate ecological potential;
- Conwy Transitional Water BodyGB541006614800 – HMWB, Moderate ecological potential.

Figure B 4-1: Water Framework Directive Water Bodies and Designated Protected Sites

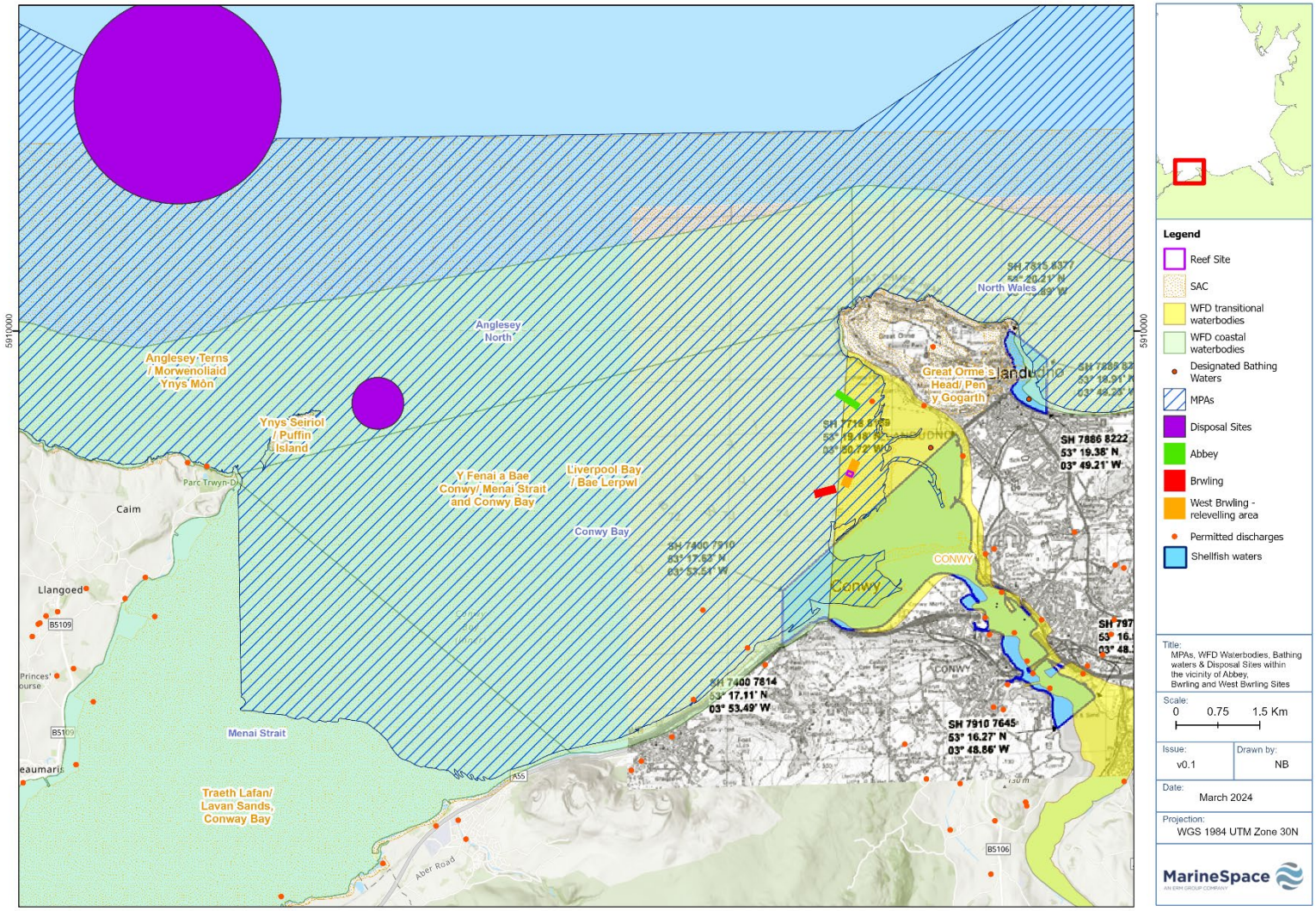
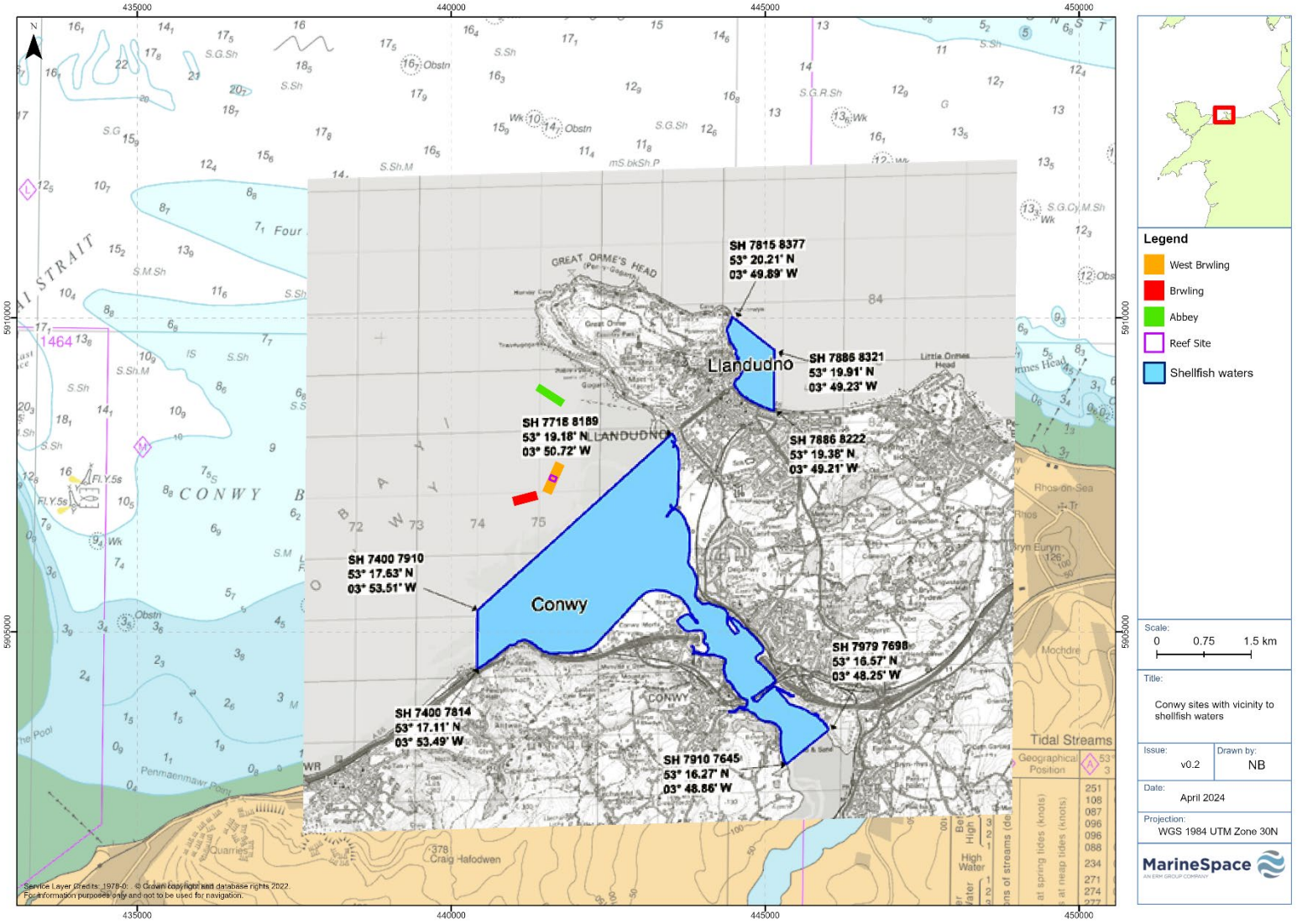


Figure B 4-2: Designated Shellfish Waters in the Conwy Bay area as defined by the Welsh Government, NRW and Cefas (2016)



4.2. Stage 2: Scoping

Stage 2 (Scoping) allows the applicant to define and agree the scope of further assessment that may be required in Stage 3. This involves identification of WFD water quality elements that may be at risk from the proposed development's activities.

A scoping exercise has been conducted prior to the assessment following the EA guidelines as follows:

Your activity	Description, notes or more information
Applicant name	Zoological Society of London
Application reference number (where applicable)	*n/a*
Name of activity	Wild Oysters Project Conwy – Cultch re-levelling
Brief description of activity	Work will involve levelling of cultch peaks to restore bathymetric conditions in Conwy Bay aiming achieve a uniform reef height of a maximum of 0.5 m.
Location of activity (central point **XY coordinate**s or national grid reference)	Site maps and boundary coordinates provided in licence application. Coordinates of the West Bwrling licensed area under DEML2284 where re-levelling may be undertaken: *West Bwrling* *53.3148517°N -3.8734793°W* *53.3154556°N -3.8756607°W* *53.3111689°N -3.8787716°W* *53.3105959°N -3.8765791°W*
Footprint of activity	Up to 0.08 km^2 including the potential for future re-levelling works within the West Bwrling licensed area.
Timings of activity (including start and finish dates)	Levelling works for the currently identified peaks are proposed to be undertaken as soon after determination of the licence as practicably possible. Any future re-levelling works have the potential to be undertaken up until the expiration of the current MLA DEML2284 in 05/12/2029 within the West Bwrling licensed area.
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	Approximately 10 days for individual re-levelling events. No discharge or collection will take place, only rearrangement of the cultch within the West Bwrling licensed area (approx..0.08 km^2) where cultch can be deposited to achieve a maximum reef height of 0.5m. Full methods provided in Marine Licence application.

Use or release of chemicals (state which ones)	No chemicals will be used in this project.

Water body[1]	Description, notes or more information
WFD water body name	Conwy Bay Coastal Water Body
Water body ID	GB671010400000
River basin district name	Western Wales
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	4966.9 ha
Overall water body status (2015)	Moderate
Ecological status	Moderate
Chemical status	Moderate
Target water body status and deadline	Good Ecological Potential (2027)
Hydromorphology status of water body	N/A
Heavily modified water body and for what use	Yes – nature protection and other ecological uses
Higher sensitivity habitats present	-
Lower sensitivity habitats present	Subtidal soft sediments like sand and mud; subtidal rocky reef; intertidal soft sediments like sand and mud.
Phytoplankton status	Good

History of harmful algae	Not reported
WFD protected areas within 2km	Yes
Water body[1]	**Description, notes or more information**
WFD water body name	Conwy Transitional Water Body
Water body ID	GB541006614800
River basin district name	Western Wales
Water body type (estuarine or coastal)	Transitional
Water body total area (ha)	1556
Overall water body status (2015)	Moderate
Ecological status	Moderate
Chemical status	Moderate
Target water body status and deadline	Good Ecological Potential (2027)
Hydromorphology status of water body	Not high
Heavily modified water body and for what use	Yes – flood protection
Higher sensitivity habitats present	Mussel beds; salt marsh
Lower sensitivity habitats present	Subtidal rocky reef; intertidal soft sediments like sand and mud
Phytoplankton status	Good

History of harmful algae	Not reported
WFD protected areas within 2km	Yes

Specific Risk Information

Applicable to both water bodies.

Consider the potential risks of your activity to each of these receptors: hydromorphology, biology (habitats and fish), water quality and protected areas. Also consider invasive non-native species (INNS).

Section 1: Hydromorphology

Consider if hydromorphology is at risk from your activity.

Use the water body summary table to find out the hydromorphology status of the water body, if it is classed as heavily modified and for what use.

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status	Requires impact assessment	Impact assessment not required	**No**
Could significantly impact the hydromorphology of any water body	Requires impact assessment	Impact assessment not required	**No**
Is in a water body that is heavily modified for the same use as your activity	Requires impact assessment	Impact assessment not required	**No**

Record the findings for hydromorphology and go to Section 2: Biology.

Section 2: Biology

Habitats

Consider if habitats are at risk from your activity.

Use the water body summary table and Magic maps, or other sources of information if available, to find the location and size of these habitats.

Higher sensitivity habitats [2]	Lower sensitivity habitats [3]
Chalk reef	Cobbles, gravel and shingle
Clam, cockle and oyster beds	Intertidal soft sediments like sand and mud
Intertidal seagrass	Rocky shore
Maerl	Subtidal boulder fields
Mussel beds, including blue and horse mussel	Subtidal rocky reef
Polychaete reef	Subtidal soft sediments like sand and mud
Saltmarsh	
Subtidal kelp beds	
Subtidal seagrass	

[2] Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.

[3] Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.

Consider if the footprint[4] of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km^2 or larger	Yes to one or more – requires impact assessment	No to all – impact assessment not required	**No**
1% or more of the water body's area			**No**
Within 500m of any higher sensitivity habitat			**No**
1% or more of any lower sensitivity habitat			**No**

[4] Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.

Fish

Consider if fish are at risk from your activity, but only if your activity is in an estuary or could affect fish in or entering an estuary.

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Continue with questions	Go to next section	**No**
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment	Impact assessment not required	**No**

Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	**No** – no water abstraction is taking place

Record the findings for biology habitats and fish and go to section 3: Water Quality.

Section 3: Water Quality

Consider if water quality is at risk from your activity.

Use the water body summary table to find information on phytoplankton status and harmful algae.

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment	Impact assessment not required	**No** – any disturbance would be short-term
Is in a water body with a phytoplankton status of moderate, poor or bad	Requires impact assessment	Impact assessment not required	**No** - both waterbodies have a phytoplankton status of good
Is in a water body with a history of harmful algae	Requires impact assessment	Impact assessment not required	**No**

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	**No**
It disturbs sediment with contaminants above Cefas Action Level 1	**Requires impact assessment**	Impact assessment not required	**Yes** - Sediment chemistry in this area is unknown. As such, it cannot be ruled out that sediment disturbance may lead to mobilisation of contaminated sediment.

If your activity has a mixing zone like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	**No** – no chemicals will be released

Record the findings for water quality and go on to Section 4: WFD Protected Areas.

Section 4: WFD Protected Areas

Consider if WFD Protected Areas are at risk from your activity. These include:

- Bathing waters: Llandudno West Shore ID 40200, classified as Excellent in 2021. 1.5 km from re-levelling site;
- Shellfish waters: Conwy area 0.7 km from West Bwrling re-levelling site;

- Nutrient Sensitive Areas: There are no nutrient sensitive areas within 30 km of the project – **Scoped out**; and
- Marine protected areas SACs and SPAs:
    - Liverpool Bay/Bae Lerpwl SPA UK9020294, 0 km from re-levelling site;
    - Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC UK0030202, 0 km from re-levelling site.

Use Magic maps to find information on the location of protected areas in your water body (and adjacent water bodies) within 2 km of your activity.

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2 km of any WFD protected area[6]	**Requires impact assessment**	Impact assessment not required	**Yes – the cultch is sitting within an SPA and SAC. The proposed licence area is also within 0.7 km of the closest designated Shellfish Water, and one designated bathing water within 1.5 km.**

[6] Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.

Record the findings for WFD Protected Areas and go to Section 5: Invasive Non-native Species.

Section 5: Invasive Non-native Species (INNS)

Consider if there is a risk your activity could introduce or spread INNS.

Risks of introducing or spreading INNS include:

- Materials or equipment that have come from, had use in or travelled through other water bodies; and
- Activities that help spread existing INNS, either within the immediate water body or other water bodies.

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment	Impact assessment not required	**No - The presence of carpet sea squirts has been recorded in Holyhead, Wales, in 2008. Therefore, extra biosecurity measures have been taken.** The Saint David tug vessel has been sourced locally and came out of a dry dock in May 2023, after which antifouling was carried out. The plough has been out of water for over 3 years and is

			additionally stored out of water when not in use, thus reducing the risk of invasive non-native species (INNS).

Record the findings for INNS and go to the Summary section.

Summary

Summarise the results of scoping here.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	
Biology: habitats	No	
Biology: fish	No	
Water quality	**Yes**	Sediment chemistry in this area is unknown. As such, it cannot be ruled out that sediment disturbance may lead to mobilisation of contaminated sediment.
Protected areas	**Yes**	The proposed licence area is within 700 m of the closest designated Shellfish Water, and 1 designated Bathing Water lies within 1.5 km. The relevelling site is located within a SPA and a SAC.
Invasive non-native species	No	

If you haven't identified any receptors at risk during scoping, you don't need to continue to the impact assessment stage and your WFD assessment is complete.

If you've identified one or more receptors at risk during scoping, you should continue to the impact assessment stage.

Include your scoping results in the WFD assessment document you send to your activity's regulator as part of your application for permission to carry out the activity.

4.3. Stage 3: Detailed Compliance Assessment

This section presents the results of the detailed compliance assessment undertaken using the method outlined in Section 3. The assessment will consider whether the project activities scoped into assessment during Stage 2 (Scoping) will lead to a significant non-temporary deterioration in any waterbody elements, when considered at a waterbody level.

The WFD receptors at risk identified by the Stage 2 Scoping and carried forward to Stage 3 Detailed Compliance Assessment are:

- Water Quality; and
- Protected areas.

4.3.1 Embedded Mitigations

Mitigation measures have been planned and are set out to reduce any effects origination from the Proposed Project activity. Embedded measures including the implementation of a biosecurity plan and a series of emergency response and pollution control plans aiming at reducing and minimising the potentials for environmental degradation (e.g. adherence to MARPOL), will prevent and contain the spreading of contaminants, litter and INNS armful to the environment.

4.3.2 Impacts Assessment

4.3.2.1 Water Quality

Potential impacts on water quality have been included in assessment due to the risk of mobilising sediment which contains contaminant levels in excess of Cefas Action level 2. The levelling of the cultch's peaks on the seafloor is likely to lead to some degree of disturbance to seabed sediments. It is likely that any such disturbance would cause suspension of sediment and the formation of localised sediment plumes.

The current re-levelling area is located in the west section of the West Bwrling licence area, in proximity to the Conwy river, river mouths in areas of high industrial activity can often be associated with poor sediment quality. Four small sewage pumping station and points of discharge are dotted around the Llandudno coastal area (Figure B 4-1). The closest to the cultch is located 1.3 km to the northeast. Some are however storm overflow point only in use in an event of an emergency. These discharge points are monitored and well managed by Dŵr Cymru Welsh Water, and only occasional issues occur.

The Llanrwst and the Llandudno areas in North Wales have a rich history of mining, particularly for lead and zinc and copper. The Great Orme mine is a copper mine located dating back to the bronze age, with the main mining activities ceasing by the 600 BC and the last mining activities ceasing by the 19th century, therefore abandoned for 100s of years. The Cyffty Mine, located near Llanrwst in the Gwydir Forest Park, is one such site where Lead and Zinc mining activities were prominent. The industry has long since ceased (early 1900's) but Lead and Zinc have been found in the sediment of the river Conwy, which drains Llanrwst Mining Field. The dispersion and sediment-water partitioning of metals have been studied, with findings indicating that these compounds continue to be

episodically dispersed through river catchments hundreds of years after the cessation of mining activity, especially during flood flows (Brydie and Polya, 2018)[8].

However, these sediment-bound compounds are concentrated in fine grained sediments, located primarily within the river and the mouth of the estuary (and upper catchment) (Brydie and Polya, 2018). The transitional water body has status of Moderate, indicating that monitoring has not highlighted major pollution concerns. Overall, there has been minimal recent industrial activity in the area surrounding the river Conwy. As such, there is thought to be medium risk of contamination in sediments associated with the river Conwy. In view of this, it would not be expected that seabed sediments are likely to contain contaminants in concentrations exceeding Cefas Action Level 2.

Accordingly, it is concluded that these works will not jeopardise the attainment of the WFD objectives nor impede the implementation of mitigation measures to aid the improvements of the current waterbody status (to GEP) for both, the Conwy Transitional, and Conwy Bay Coastal waterbodies.

4.3.2.2 Impacts on Protected Areas

Bathing waters

The Bathing Water Directive introduces a classification system with stringent water quality standards and puts an emphasis on providing information to the public. There is one designated bathing water site, 1.5 km from the proposed re-levelling site, as presented in Figure B 4-1 of this Appendix.

Changes to water quality may result in indirect impacts on local designated bathing waters. However, The Bathing Water Directive classifications are primarily based on two microbiological parameters: *Escherichia coli* (*E. coli*) and intestinal enterococci. There is very little cause to suspect that the activities proposed for works will cause notable increase in either of these bacteria, and therefore it is unlikely to impacts on bathing waters.

In addition to consideration of bathing water classification, activities associated with the project may impact public enjoyment of designated bathing waters if there is significant change in water clarity. There may be small, localised increases in SSC following cultch deployment, which may be carried towards local designated bathing waters. However, given the small increases in SSC predicted for these activities and the short duration they are expected to remain in suspension, this is not predicted to have a noticeable impact on public enjoyment of the sites. Any changes will be small in magnitude and will only occur during and shortly after deployment activities. As such, potential for adverse impacts is considered to be negligible and not cause any significant degradation.

Shellfish waters

Shellfish Waters are areas designated under the Shellfish Waters Directive, they are areas of higher economically significant species. Figure B 4-2 of this Appendix provides an overview of the licensed

[8] Brydie J, Polya D, 2008. Metal dispersion in sediments and waters of the River Conwy draining the Llanrwst Mining Field, North Wales. Mineralogical Magazine. 2003;67(2):289-304

areas DEML2284, including West Bwrling, with the area of the cultch to be re-levelled relative to local shellfish waters. At its closest point, the nearest designated shellfish water is approximately 700 m. There is potential for impacts to arise if a large plume was created, as this may pose potential issues to shellfish in filter-feeding. However, given the small scale of the re-levelling activity, 0.08 km^2 within the West Bwrling licensed area, it is expected that an associated sediment plumes will be small in terms of both spatial extent and elevations in turbidity. It is expected that any increase in SSC will be highly localised, and increases will not be measurable at any of the local shellfish water sites and therefore not cause any significant degradation. Furthermore, any increases that do occur would be short-term and would be expected to disperse within a single tidal cycle. As such, this would not qualify as a non-temporary impact. In view of these factors, the predicted effects from the proposed works are not expected to result in in significant impacts on designated shellfish waters.

Special Areas of Conservation (SAC)/Special Protected Areas (SPA)

Two marine protected areas have been identified:

- Liverpool Bay / Bae Lerpwl SPA UK9020294, 0 km from re-levelling site.
  It is classified for the protection of red-throated diver *Gavia stellata*, common scoter *Melanitta nigra*, and little gull *Hydrocoloeus minutus* in the non-breeding season; common tern *Sterna hirundo* and little tern *Sterna albifrons* in the breeding season, and an internationally important waterbird assemblage;
- Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC UK0030202, 0 km from re-levelling site. The qualifying habitats, are:
  - Mudflats and sandflats not covered by seawater at low tide;
  - Reefs;
  - Sandbanks which are slightly covered by seawater all the time;

  and supports a significant presence of:
  - Large shallow inlets and bays;
  - Submerged or partially submerged sea caves.

Impacts on Special Areas of Conservation (SACs) and Special Protection Area (SPAs) have been considered in a separate HRA screening. No Likely Significant Effect (LSE) could be determined for all features and designated sites screened in (refer to section 4 of the scoping assessment), as such no sites have been screened in and taken forward for Appropriate Assessment. It is concluded that the project will result in no adverse effect on site integrity on any SAC, SPA, or Ramsar Site, or any of their conservation objectives and qualifying features.

4.4. Conclusions

An assessment has been undertaken of the potential for impacts predicted to arise as a result of the project. These have been presented in relation to surrounding WFD waterbodies the Conwy Bay Coastal Water Body and the Conwy Transitional Water Body, to assess the potential for works to lead to deterioration of status or to jeopardise a waterbody achieving GEP under the WFD. Following the scoping process a series of potential impacts were assessed, including the risk to Water Quality

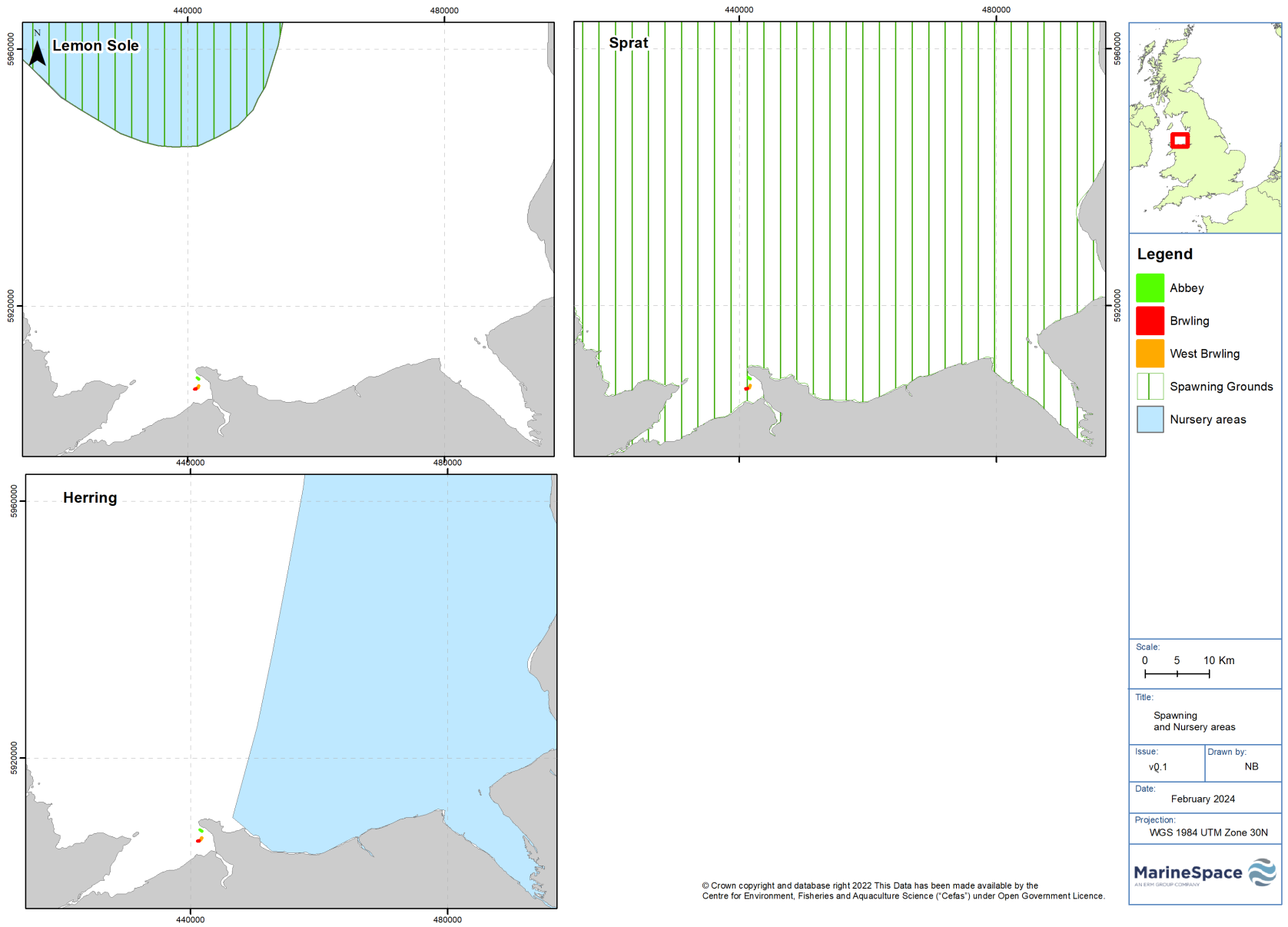
and Protected Areas. Following consideration of the project's mitigation, including a biosecurity plan, no impacts were identified on any WFD waterbody and the proposed cultch re-levelling plan is considered WFD compliant.

Appendix C. An Overview of Fish and Shellfish Spawning Areas

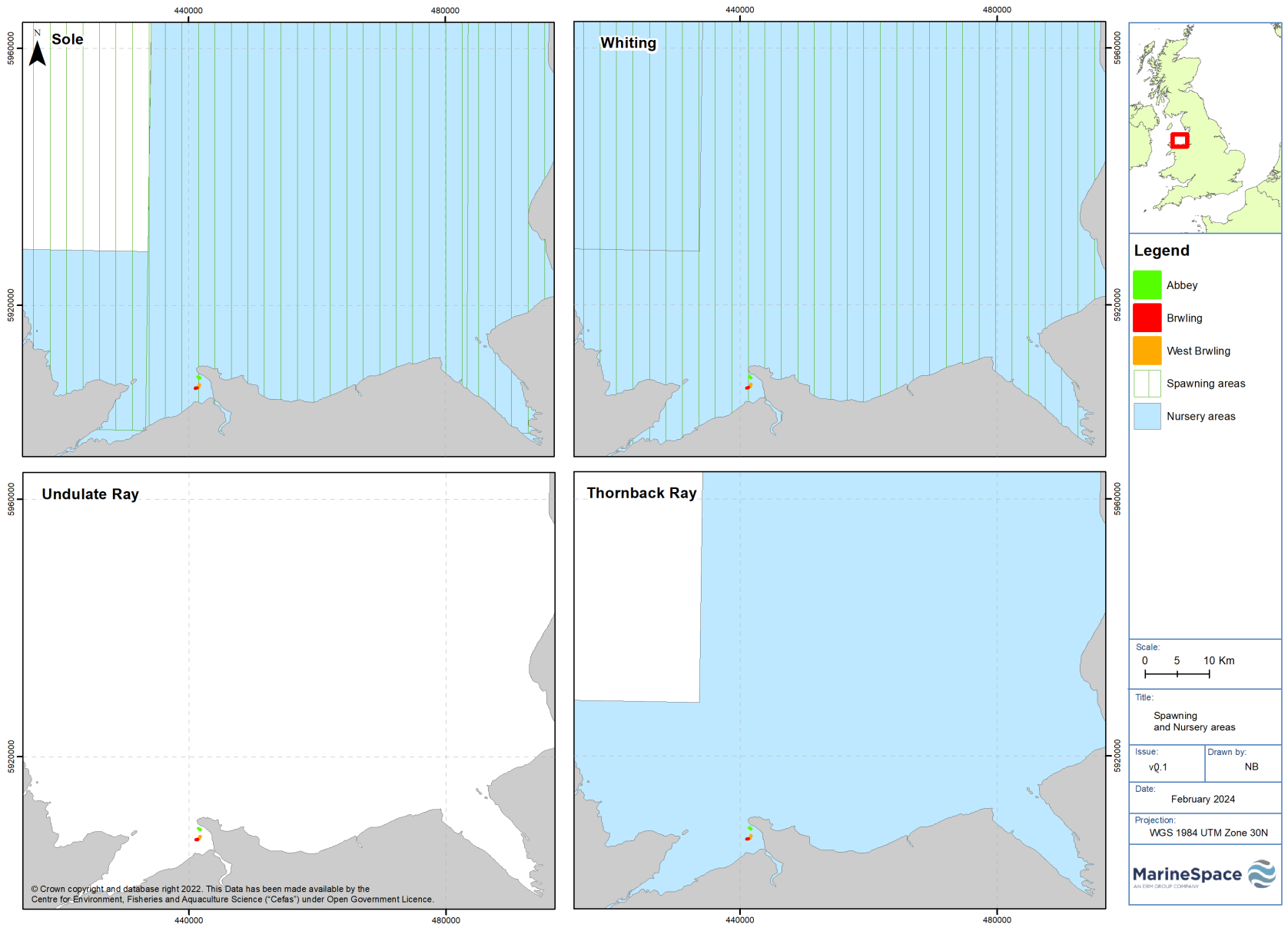
Fish and shellfish spawning and nursery areas are depicted below by species, using 2016 data from NRW.

The Wild Oysters Project Conwy Bay - Cultch Re-levelling

The Wild Oysters Project Conwy Bay - Cultch Re-levelling



The Wild Oysters Project Conwy Bay - Cultch Re-levelling



MarineSpace
AN ERM GROUP COMPANY

Southampton
Ocean Village Innovation Centre
Ocean Way
Southampton
Hampshire
SO14 3JZ

Pembroke Dock
2nd Floor
Pier House
Pier Road
Pembroke Dock
Pembrokeshire
SA72 6TR

Norwich
8 Thorpe Road
Norwich
NR1 1RY

Darlington
Suite 5
1st Floor
The Yarn
Lingfield House
Darlington
DL1 1RW