

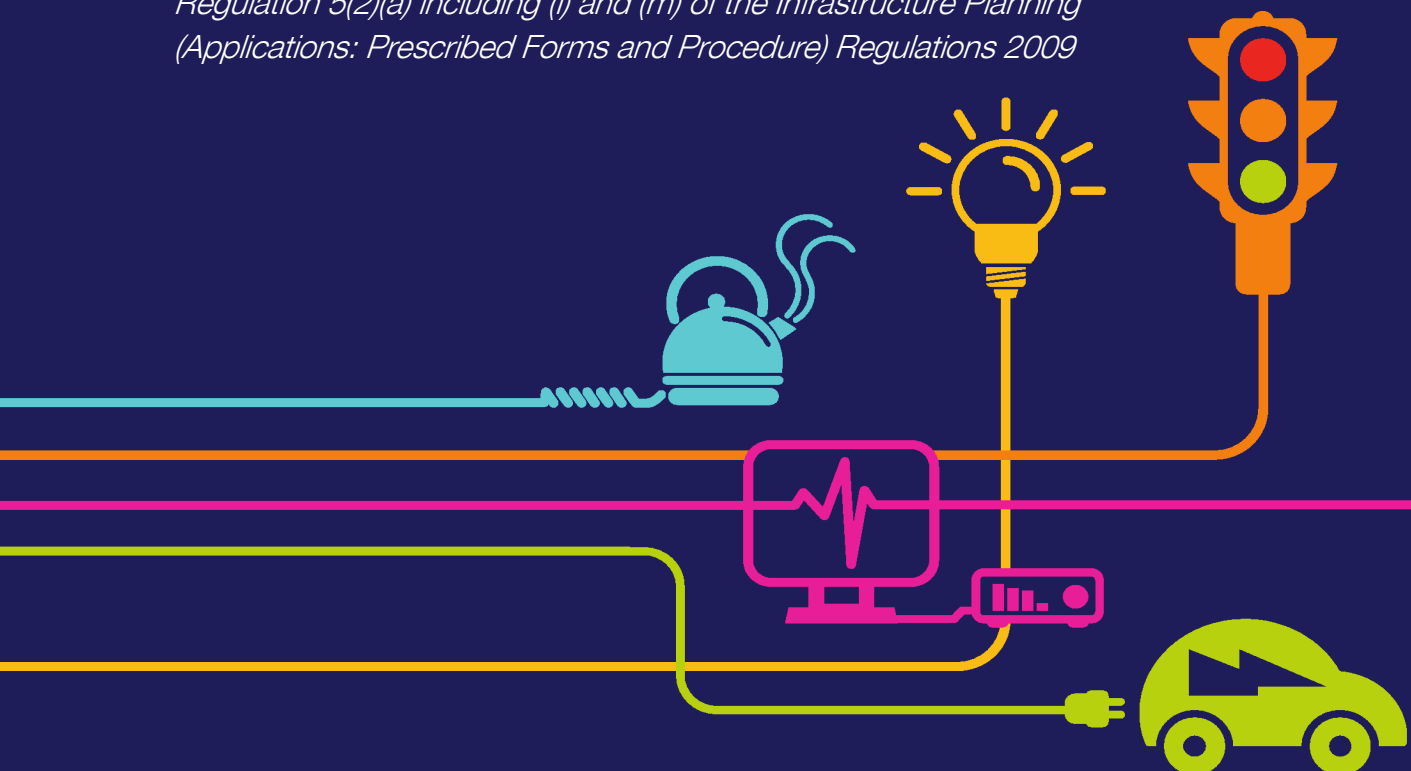
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# Subtidal Report

## Chapter 9 – Appendix 17

National Grid (North Wales Connection Project)

*Regulation 5(2)(a) including (l) and (m) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009*





**nationalgrid**

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# **North Wales Connection Project**

## **Volume 5.9**

### **Document 5.9.2.17 Appendix 9.17 Subtidal Report**

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# 1 Introduction

## 1.1 INTRODUCTION

### *Description of the Proposed Development*

1.1.1 The Proposed Development would provide a new 400 kilovolt (kV) connection between the existing substations at Wylfa and Pentir and includes the following principal components:

- extension to the existing substation at Wylfa;
- sections of new 400 kV overhead line between Wylfa Substation and Braint Tunnel Head House (THH) and Cable Sealing End Compound (CSEC) on Anglesey including modifications to parts of the existing 400 kV overhead line between Wylfa and Pentir;
- Braint THH and CSEC on Anglesey;
- tunnel between Braint and Tŷ Fodol THHs;
- Tŷ Fodol THH and CSEC in Gwynedd;
- new section of 400 kV overhead line between Tŷ Fodol THH and CSEC and Pentir Substation;
- extension to the existing substation at Pentir; and
- temporary construction compounds, access tracks, construction working areas, localised widening of the public highway and third party works that are required to construct the infrastructure listed above.

1.1.2 A full description of the Proposed Development is provided in Chapter 3, Description of the Proposed Development (**Document 5.3**) and Chapter 4, Construction, Operation, Maintenance and Decommissioning of the Proposed Development (**Document 5.4**).

### *Introduction to the Report*

1.1.3 This report details the findings of the Menai Strait subtidal ecology surveys carried out in July 2015. This report also identifies relevant legislation and planning policy relating to marine habitats and species, which are outlined in section 2.

### *Objectives*

- 1.1.4 The bored tunnel between Braint and Tŷ Fodol THHs to allow the cables to cross the Menai Strait will require appropriate licences to proceed, the application for which are supported by an Environmental Statement (ES) (Chapter 9, Ecology and Nature Conservation (**Document 5.9**)), and a Habitats Regulations Assessment (HRA) (Applicants Report to Support the Habitats Regulations Assessment (**Document 5.23**)).
- 1.1.5 The aim of this work is to characterise the subtidal benthic communities present and identify areas of the corridor where habitats and/or species of conservation importance exist to inform the ES and HRA. Although the survey work was undertaken to support the Project's options appraisal process, the baseline data generated are still relevant for the purposes of the ES.

## 2 Legislation and Planning Policy

### 2.1 LEGISLATION

- 2.1.1 The level of statutory protection afforded to sites, habitats and species is used in the Environmental Impact Assessment (EIA) process both in the consideration of legal compliance, but also as it indicates the ecological importance of these features. The legislative instruments relevant to marine ecology and nature conservation are discussed in this section.

#### *The Conservation of Habitats and Species Regulations 2017*

- 2.1.2 The Conservation (Natural Habitats &c.) Regulations 1994 transposed the provisions of Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (Habitats Directive) into UK law.
- 2.1.3 The Conservation of Habitats and Species Regulations 2017 further enact within England and Wales the Habitats Directive. Part 2 of these Regulations covers the selection, designation, registration and management of European sites (also known as Natura 2000 sites). Schedule 2 of the Regulations lists the European protected species of animals whilst Schedule 5 lists the European protected species of plants. Conservation Objectives (referred to within Article 6(3) of the Habitats Directive) ensure that the European protected species identified as qualifying features of a Natura 2000 site remain or reach favourable condition (such as by maintaining the extent and distribution of habitats of qualifying features). This means that where the Proposed Development may affect a Conservation Objective of a Natura 2000 site, the design will need to include appropriate measures to ensure the Conservation Objectives are not adversely affected.

#### *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017*

- 2.1.4 The Water Framework Directive (WFD) 2000/60/EC was adopted and came into force in 2000 and represents a culmination in EU water resource protection. The WFD is transposed into law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The Directive aims for 'good status' for all groundwaters

and surface waters (rivers, lakes, estuaries, coastal waters) in the EU, according to biological, hydro morphological, physico-chemical and chemical criteria.

*Marine Strategy Framework Directive, 2008/56/EC*

2.1.5 The Marine Strategy Framework Directive (MSFD) came into force in July 2008 and into UK regulation via The Marine Strategy Regulations, in July 2010. The MSFD requires member states to achieve Good Environmental Status (GES) in all marine waters from the coastline out to the limit of territorial waters by 2020. The MSFD requires an assessment of what GES means for UK waters, with associated targets and indicators, plus an assessment of the current state of UK seas. A monitoring programme to assess progress towards GES was implemented in 2014. There are 11 high-level descriptors used to assess GES: biological diversity, non-indigenous species, commercial fisheries, food webs, eutrophication, seafloor integrity, hydrographical conditions, contamination, seafood contamination, marine litter and noise. The Marine Management Organisation will be the prime regulator. There will be an overlap in the first nautical mile from the coast between MSFD and WFD.

2.1.6 Consideration should be given with regards to the elements of the Proposed Development which may affect the achievement of GES for UK marine waters.

*Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive), Directive 92/43/EEC*

2.1.7 This Directive provides protection to the habitats listed on Annex I and to the European protected species listed in Annex II through the provision of a network of protected sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)). This network is often referred to as Natura 2000. The Directive also provides special protection to European protected species where they occur outside of the boundary of a Natura 2000 site.

*Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1979)*

2.1.8 The Bern Convention aims to ensure conservation of wild flora and fauna species and their habitats, particularly those that are endangered or vulnerable. Such species are specified in the appendices to the Convention.

- 2.1.9 There should be consideration of the impact of the Proposed Development on the conservation of wild flora and fauna during the planning and development stages.

*Marine and Coastal Access Act 2009*

- 2.1.10 The Marine and Coastal Access Act 2009 allows for the creation of Marine Conservation Zones to protect a range of nationally important marine wildlife, habitats, geological and geomorphological sites. Sites are yet to be created in Welsh waters, but those that were originally identified and taken to consultation have new recommendations made by the Minister of Natural Resources and Food.

- 2.1.11 This Act also provides the framework for obtaining consents for various works in the marine environment. These consents are granted by Natural Resources Wales (NRW) through the Marine Licensing Team. A Marine Licence may be required for subseabed works in relation to the Proposed Development (i.e. when crossing the Menai Strait).

*The Countryside and Rights of Way Act 2000*

- 2.1.12 The Countryside and Rights of Way Act 2000 applies to England and Wales only. Part III of the Act deals specifically with wildlife protection and nature conservation.

- 2.1.13 The Act places a duty on Government Departments and the Welsh Government to have regard for the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity.

- 2.1.14 Schedule 9 of the Act amends the Sites of Special Scientific Interest (SSSI) provisions of the Wildlife and Countryside Act 1981 (as amended), including increased powers for the protection and management of SSSIs. The provisions extend powers for entering into management agreements; place a duty on public bodies to further the conservation and enhancement of SSSIs; increase penalties on conviction where the provisions are breached; and include an offence whereby third parties can be convicted for damaging SSSIs.

- 2.1.15 Schedule 12 of the Act amends the species provisions of the Wildlife and Countryside Act 1981 (as amended), strengthening the legal protection for threatened species. The provisions make certain offences 'arrestable', include an offence of reckless disturbance, confer greater powers to police

and wildlife inspectors for entering premises and enable heavier penalties on conviction of wildlife offences.

#### *The Wildlife and Countryside Act 1981 (as amended)*

2.1.16 The Wildlife and Countryside Act 1981 (as amended) is the major domestic legal instrument for wildlife protection in the UK, and is the primary means by which the following are implemented:

- Convention on the Conservation of European Wildlife and Natural Habitats ('the Bern Convention');
- Convention on the Conservation of Migratory Species of Wild Animals ('the Bonn Convention'); and
- Directive 2009/147/EC on the Conservation of Wild birds (the 'Birds Directive').

#### Sites of Special Scientific Interest

2.1.17 The Act provides for the notification and confirmation of SSSIs which are sites identified for their flora, fauna, geological or physiographical features by the country conservation bodies. In Wales this is NRW.

2.1.18 The Act also contains measures for the protection and management of SSSIs.

#### Other Animals

2.1.19 The Act makes it an offence (subject to exceptions) to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. The Act also prohibits certain methods of killing, injuring, or taking wild animals.

#### *Environment (Wales) Act 2016*

2.1.20 The Environment (Wales) Act Part 1 of the Act, including Sections 6 and 7, came into force on May 21, 2016.

2.1.21 Part 1 of the Environment Act sets out Wales' approach to planning and managing natural resources at a national and local level with a general purpose linked to statutory 'principles of sustainable management of natural resources' defined within the Act.

### Section 6 - Biodiversity and resilience of ecosystems duty

- 2.1.22 Section 6 of the Act places a duty on public authorities to 'seek to maintain and enhance biodiversity' so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to 'promote the resilience of ecosystems'. The duty replaces the Section 40 duty in the Natural Environment and Rural Communities (NERC) Act 2006, in relation to Wales, and applies to those authorities to which the previous duty applied.
- 2.1.23 Under this duty, Public authorities are required to report on the actions they are taking to improve biodiversity and promote ecosystem resilience.

### Section 7 - Biodiversity lists and duty to take steps to maintain and enhance biodiversity

- 2.1.24 This section replaces the duty in Section 42 of the NERC Act 2006. It requires Welsh Ministers to publish, review and revise lists of living organisms and types of habitat which they consider are of key significance to sustain and improve biodiversity in relation to Wales. As such, the UK Biodiversity Action Plan (UK BAP) priority species list and the subsequent NERC Act 2006 statutory lists of priority species and habitats have now been superseded by the lists produced at a country level under Section 7 (S7) of the Environment (Wales) Act 2016.

## **2.2 PLANNING POLICY**

### *National Policy*

- 2.2.1 Government planning policy guidance throughout the UK requires local planning authorities to take account of the conservation of protected species when determining planning or development consent applications. This makes the presence of a protected species a material consideration when assessing a development proposal.
- 2.2.2 In Wales this is implemented through Planning Policy Wales - Edition 9, November 2016, supplemented by a series of Technical Advice Notes (TANs) (Ref 1) which sets out the land use planning policies of the Welsh Government. Consultation is currently being held on the draft Planning Policy Wales – Edition 10 which was issued in February 2018; the consultation period ends in May 2018.
- 2.2.3 Chapter 5 of PPW (9) sets out the Welsh Government's objectives for the natural heritage of Wales which includes the safeguarding of protected species. It states that '*the presence of a species protected under European or UK legislation is a material consideration when a local planning authority*

*is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat'. It also states that 'an ecological survey to confirm whether a protected species is present and an assessment of the likely impact of the development on a protected species may be required in order to inform the planning decision'.*

2.2.4 Further information on the detail of Planning Policy Wales is provided in Chapter 9, Ecology and Nature Conservation (**Document 5.9**).

#### *Local Policy*

2.2.5 There are a number of local planning policies set out in the Anglesey and Gwynedd Joint Local Development Plan 2017 (Ref 2) that relate to ecology and nature conservation which in combination with other planning policies will guide local authority expectations in relation to the Proposed Development::

- Strategic Policy PS 19 relates to conserving and enhancing the natural environment;
- Policy AMG 4 relates to coastal protection;
- Policy AMG 5 relates to the protection and enhancement of local biodiversity; and
- Policy AMG 6 relates to protecting sites of regional or local significance.

#### *Biodiversity Policy*

2.2.6 As a result of devolution, and new country-level and international drivers and requirements, much of the work previously carried out by the UK Biodiversity Action Plan (BAP) is now focussed at a country-level rather than a UK-level. The UK BAP was succeeded by the 'UK Post-2010 Biodiversity Framework' in July 2012. However, the UK list of priority species and habitats, remains an important reference source and has been used to help draw up statutory lists of priorities in England, Scotland, Wales and Northern Ireland. In Wales the current lists are those under Section 7 of the Environment (Wales) Act 2016 which includes marine species present in UK waters.

2.2.7 The national strategy for biodiversity is delivered at local level via Local Biodiversity Action Plans (LBAPs). Species and habitats of local conservation concern or value are included in the LBAP and an action plan is created for each species and certain habitat types. The LBAPs relevant to the study area for the Proposed Development are the Anglesey LBAP



published by Isle of Anglesey County Council (IACC) and the Natur Gwynedd LBAP for Gwynedd developed by a partnership of organisations and individuals.

- 2.2.8 The Wales Biodiversity Partnership (WBP) brings together key members from the public, private and voluntary sectors to promote and monitor biodiversity and ecosystem action in Wales. WBP provides a leadership role and an expert steer on priorities for action on biodiversity and ecosystems in Wales. The WBP Steering Group has now formally disbanded and the biodiversity action work programme taken on by the Wales Biodiversity Strategy Board (WBSB) and the WBP working groups.

## 3 Methodology

### 3.1 OVERVIEW

- 3.1.1 The physical character of the general area varies considerably, from narrow straits characterised by a rocky substratum and high tidal currents to broader sections of the Menai Strait, in the north-eastern and south-western margins, where sedimentary habitats are present and the tidal flow regime is less severe.
- 3.1.2 The crossing of the Menai Strait would be between Y Felinheli in the south-west and the Menai Suspension Bridge in the north-east. Marine ecological assessments were undertaken within this area of the Menai Strait.
- 3.1.3 The whole of the crossing corridor is within the Menai Strait and Conwy Bay Special Area of Conservation (SAC) which is primarily designated for three Annex I habitat types, two of which are present within the defined subtidal survey area: 'reefs' and 'intertidal mudflats and sandflats.'
- 3.1.4 Over much of the Menai Strait the uppermost boundary of the SAC is delineated by the mean low water mark; the exception being an area of intertidal habitats on the north shore between the Britannia and Menai bridges.
- 3.1.5 Due to the complex nature of the subtidal benthic habitats a drop-down camera was used to identify epibenthic communities, while infaunal sediment communities were sampled by grabs. There was some overlap in the areas surveyed by the two approaches with camera work covering the most northerly end of the survey area, where hard ground was known to be prevalent, and both camera and grabs used throughout the remainder of the survey area (see Figure 1 for the survey locations).

### 3.2 DROP-DOWN CAMERA SURVEY

- 3.2.1 Drop-down camera surveys provide a means of gathering data over a wide area within a relatively short time period, and from areas where other forms of remote sampling, such as grabbing, are not possible. Data generated from image analysis allow communities to be identified and biotopes assigned to areas not sampled during the grab survey.

### *Sampling Methodology*

- 3.2.2 The equipment used comprised a camera mounted within a rigid frame which was deployed from RV Aquadynamic.
- 3.2.3 Site positional data were programmed into the navigation and survey computers. The vessel approached each station in a head-to-tide direction. A dynamic positioning (DP) system was used to ground-stabilise the vessel and maintain the deployment pulley and camera directly over the site.
- 3.2.4 Once a stable position was achieved the drop-down camera cage was deployed and lowered to a few metres above the seabed before being slowly lowered the remaining distance; thus reducing mobilisation of bed sediments. Once the cage touched the seabed a photographic image was taken and the position fixed. Example photographs are presented in Appendix A.
- 3.2.5 The cage was then lifted a few metres above the bed for a short period, before being lowered again and a further image captured. Three photographic images were taken at each site.

### *Data Processing*

- 3.2.6 Images were viewed and all taxa identified to the lowest possible taxonomic level using relevant keys and photographic guides. Taxa were semi-quantified using the SACFOR scale of abundance: super-abundant (S), abundant (A), common (C), frequent (F), occasional (O) and rare (R). Subsequently, biotopes were ascribed to each habitat to the lowest possible level of the Marine Habitat Classification Hierarchy. Any features, species or community complexes of conservation importance were highlighted.

## **3.3 GRAB SURVEY**

- 3.3.1 Quantitative subtidal benthic samples from sedimentary habitats have traditionally been collected by grabs. Sampling in the Menai Strait was carried out using a Hamon grab, which has proved to be reliable in collecting material from coarse sediments such as sands, gravel and cobbles that are characteristic of the sedimentary habitats found within the survey area.
- 3.3.2 The survey was undertaken on 16 July 2015, the weather being clear and settled.

### *Site Selection*

- 3.3.3 Eight sites (G01 – G08) were sampled in the south-western half of the survey area (see Figure 1), where sedimentary habitats were prevalent (and thus permitted sampling).

### *Sampling Methodology*

- 3.3.4 Samples were collected using a 0.1 m<sup>2</sup> mini-Hamon grab deployed from the coastal RV Mersey Guardian. Three replicate grabs were collected at each site and GPS used to maintain position. Biological samples were washed over a 0.5 mm sieve, with all material retained on the sieve fixed and stored in a 4% formaldehyde solution.

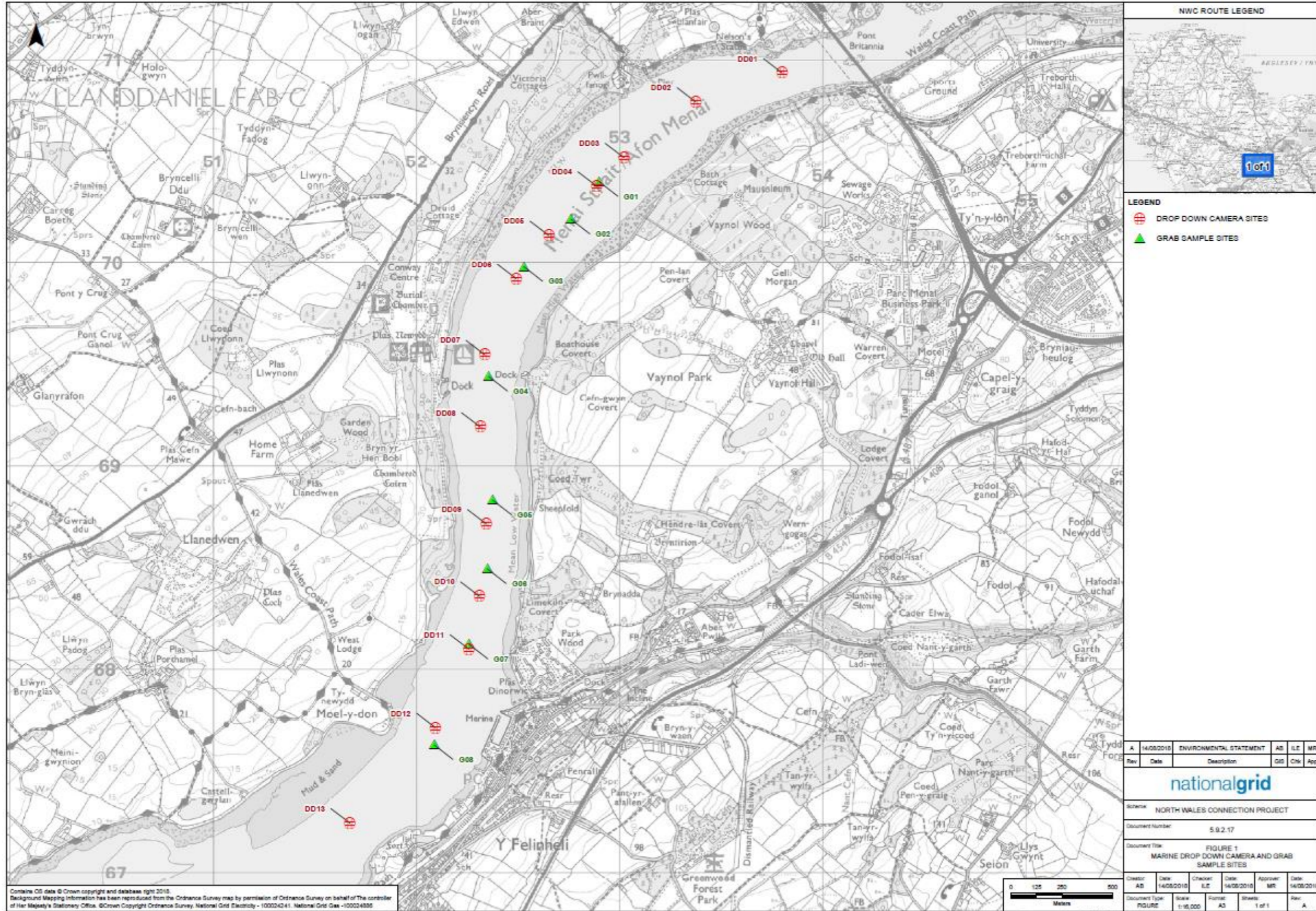
### *Sample Processing and Data Analysis*

- 3.3.5 In the laboratory faunal samples were sieved to remove the formalin and elutriate some of the fauna, thereby reducing damage to the organisms. Following this the samples were washed over stacked sieves of 4 mm, 2 mm and 1 mm to facilitate the removal of fauna from the residue. Subsequently, all fauna were picked from the residue fractions and specimens identified and enumerated. Fauna were identified to species level, where possible, using relevant keys and low or high powered microscopes, as appropriate.
- 3.3.6 A combination of physical and biological data was then used to assign biotopes describing the communities present at each site. This information was used to identify any communities and species of conservation importance.

## **3.4 SITE SELECTION AND LIMITATIONS**

- 3.4.1 Thirteen sites (DD01 – DD13) were sampled between the Britannia Bridge and Y Felinheli (see Figure 1). Initially sites between the Britannia and Menai bridges had been incorporated in to the survey plan; however, the strong tidal flows in this area were unsuitable for camera deployment.





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## 4 Results

### 4.1 DROP-DOWN CAMERA SURVEY

#### *Broad Habitats*

- 4.1.1 Photographic records referred to in this section are presented in Appendix A (Plates 1-12). Habitats within the survey area fell into two broad types, circalittoral rock and sublittoral sediment. The former, as characterised by boulders and cobble, was only recorded at the most northerly site sampled (DD01) (see Plate 1). At all other drop-down camera sites the seabed comprised a mosaic of sand, gravel and cobbles in varying proportions (e.g. Plate 2 and 3). In the sublittoral sediment broken shell was also present, particularly at sites DD05 and DD06 where large numbers of mussel shells were recorded (see Plate 4). All sites were clearly influenced by strong tidal currents and were generally free of silt and fine sediments; however, towards the south-western end of the survey area, where currents were less severe, patches of muddy sand were present (Plate 5).

#### *Biotopes*

- 4.1.2 From the relative abundance of the characterising biota five epibenthic biotopes were identified from the drop-down camera images which are discussed below. The characteristic fauna identified at each site are listed in Table 4.1 (Biotope codes are according to Ref 3). A complete taxa list along with SACFOR abundance of the biota is provided in Appendix A Table A1.
- **CR.HCR.FaT.BaITub - *Balanus crenatus* and *Tubularia indivisa* on extremely tide-swept circalittoral rock.** This biotope was recorded at site DD01 which was located immediately to the west of the Britannia Bridge. The most north-westerly survey site featured the strongest tidal flows throughout the survey area. The community here was sparse and characterised by species tolerant of the currents such as barnacles and the anemone *Sagartia elegans* (Plate 7).
  - **SS.SSa.IFiSa.ScupHyd - *Sertularia cupressina* and *Hydrallmania falcata* on tide-swept sublittoral sand with cobbles or pebbles.** This was the most common biotope being recorded at eight sites throughout the survey area. The community was characterised by

hydroids, particularly *Hydrallmania falcata* which was common at all sites to which this biotope was assigned with *Sertularia cupressina* and *S. argentea* also common. The anemone *Sagartia elegans* was also evident at a number of sites, particularly at sites in the mid and south-west stretches of the survey area (Plate 8).

- **SS.SCS.ICS – Infralittoral coarse sediment.** This biotope was recorded at site DD05 in the middle of the survey area. Here the coarse sediment of broken shell and gravel was overlain by dense aggregations of mussel shells, with little evident fauna other than a few serpulid worms on mussel shells and the occasional hydroid *Hydrallmania falcata* (Plate 9).
- **SS.SMX.CMx.OphMx - *Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment.** This biotope was present at sites DD08 and DD12. Here the communities were dominated by brittlestars forming dense aggregations. Other associated fauna included the anemones *Sagartia elegans* and *Urticina felina* (Plate 10).
- **SS.SMX.Imx.SpavSp.An - *Sabella pavonina* with sponges and anemones on infralittoral mixed sediment.** This biotope was recorded at sites DD11 and DD12 where the polychaete *Sabella pavonina* was present with the anemones *Sagartia elegans* and *Urticina felina* (Plate 11).

4.1.3 At site DD12 (Plate 12) a mosaic of two biotopes was recorded. The communities here comprised characterising species from both the SS.SMX.CMx.OphMx (*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment) and SS.SMX.Imx.SpavSp.An (*Sabella pavonina* with sponges and anemones on infralittoral mixed sediment) biotopes.

**Table 4.1: List of biotopes identified from the drop-down camera surveys. Biotope codes are according to Ref 3.**

Site	Characteristic Fauna	Biotope recorded
DD01	Barnacles, <i>Sagartia elegans</i> , <i>Cancer pagurus</i> , <i>Liocarcinus depurator</i>	CR.HCR.FaT.BalTub
DD02	<i>Hydrallmania falcata</i> , <i>Sertularia argentea</i> , <i>Asterias rubens</i> , <i>Urticina felina</i>	SS.SSa.IFiSa.ScupHyd
DD03	<i>Hydrallmania falcata</i> , <i>Sertularia argentea</i> , <i>Asterias rubens</i> ,	SS.SSa.IFiSa.ScupHyd



**Table 4.1: List of biotopes identified from the drop-down camera surveys. Biotope codes are according to Ref 3.**

Site	Characteristic Fauna	Biotope recorded
DD04	<i>Hydrallmania falcata</i> , <i>Asterias rubens</i> , <i>Urticina felina</i>	SS.SSa.IFiSa.ScupHyd
DD05	<i>Hydrallmania falcata</i> , serpulid worms.	SS.SCS.ICS
DD06	<i>Sagartia elegans</i> , <i>Hydrallmania falcata</i> , <i>Asteria rubens</i>	SS.SSa.IFiSa.ScupHyd
DD07	<i>Sagartia elegans</i> , <i>Hydrallmania falcata</i> , <i>Asterias rubens</i>	SS.SSa.IFiSa.ScupHyd
DD08	Brittlestars, <i>Sagartia elegans</i> , <i>Urticina felina</i> , <i>Asterias rubens</i>	SS.SMX.CMx.OphMx
DD09	<i>Hydrallmania falcata</i> , <i>Sagartia elegans</i> , <i>Urticina felina</i> , <i>Cerianthus lloydii</i> , <i>Asterias rubens</i>	SS.SSa.IFiSa.ScupHyd
DD10	<i>Sagartia elegans</i> , <i>Urticina felina</i> , <i>Cerianthus lloydii</i> , <i>Asterias rubens</i> , <i>Hydrallmania falcata</i>	SS.SSa.IFiSa.ScupHyd
DD11	<i>Asterias rubens</i> , <i>Sabella pavonina</i> , <i>Sagartia elegans</i>	SS.SMX.Imx.SpavSp.An
DD12	Brittlestars, <i>Sabella pavonina</i> , <i>Sagartia elegans</i> , <i>Urticina felina</i>	SS.SMX.CMx.OphMx/ SS.SMX.Imx.SpavSp.An
DD13	<i>Hydrallmania falcata</i> , <i>Sagartia elegans</i> , <i>Cerianthus lloydii</i> , <i>Asterias rubens</i>	SS.SSa.IFiSa.ScupHyd

### Conservation Features

4.1.4 No specific species of conservation importance were recorded. However, two broad habitat features were recorded (tidal swept channels, subtidal sands and gravels) that are included within the Environment (Wales) Act S7 list. These and their constituent biotopes (see points below) extended throughout much of the survey area.

- **Tidal swept channels.** CR.HCR.FaT.BalTub - *Balanus crenatus* and *Tubularia indivisa* on extremely tide-swept cirralittoral rock (site DD01).
- **Subtidal sands and gravels.** SS.SSa.IFiSa.ScupHyd - *Sertularia cupressina* and *Hydrallmania falcata* on tide-swept sublittoral sand with cobbles or pebbles (sites DD02, 03, 04, 06, 07, 09 and 13).
- **SS.SCS.ICS** – Infralittoral coarse sediment (site DD05).

## 4.2 GRAB SURVEY

### *Broad Habitats*

4.2.1 Habitats sampled generally comprised coarse substrata with varying proportions of gravel, broken shell, sand and mud. Cobbles were also present at a number of sites.

### *Faunal Characteristics*

4.2.2 A total of 268 benthic taxa were identified from the survey of which 110 were annelids, 62 molluscs, 56 crustaceans and 12 echinoderms. Other taxa identified included pycnogonids, anthozoans, nemerteans and sipunculids. The number of taxa recorded at each site varied from 76 (site G01) to 133 (site G08).

4.2.3 A total of 12,937 individuals were identified from the grab samples of which 5,138 (40%) were annelids, 2,283 (18%) molluscs, 2,133 (16%) crustaceans and 1,832 (14%) echinoderms. The number of individuals at each site varied between 789 per 0.3 m<sup>2</sup> (site 3) and 2432 per 0.3 m<sup>2</sup> (site 6).

4.2.4 The most abundant taxon was the polychaete worm *Sphaerosyllis bulbosa*, which was recorded at the six most southerly sites and represented 11.6% of all individuals identified. The brittlestar *Amphipholis squamata* was present at all sites and represented 7.4% of all individuals. Other relatively abundant taxa were juvenile mussels, and the polychaetes *Aonides oxycephala* and *Pholoe baltica* which were recorded at every site. The brittlestar *Ophiothrix fragilis* was also abundant, although this species was recorded primarily at sites in the northern end of the survey area. The amphipods *Tritaeta gibbosa* and *Erichthonius punctatus* were particularly abundant at site 2 towards the northern end of the survey area.

4.2.5 The ten most abundant taxa, which between them represented over 48% of all individuals identified, are listed in Table 4.2. A full taxa list along with their relative abundances at each grab site is provided in Appendix A Table A2.

**Table 4.2: Ten most abundant taxa identified from grab samples and abundance at each site (per 0.3 m<sup>2</sup>).**

Replicate	G01	G02	G03	G04	G05	G06	G07	G08
<i>Sphaerosyllis bulbosa</i> (P)	-	-	5	350	29	568	386	161

**Table 4.2: Ten most abundant taxa identified from grab samples and abundance at each site (per 0.3 m<sup>2</sup>).**

Replicate	G01	G02	G03	G04	G05	G06	G07	G08
<i>Amphipholis squamata</i> (E)	55	180	46	118	71	289	122	102
Mytilidae (M)	100	4	7	21	22	78	70	234
<i>Aonides oxycephala</i> (P)	1	12	10	10	28	71	103	297
<i>Ophiothrix fragilis</i> (E)	422	57	34	4	8	-	5	-
<i>Pholoe baltica</i> (P)	17	40	66	40	84	90	99	47
<i>Ericthonius punctatus</i> (C)	7	432	4	-	4	9	-	1
<i>Kurtiella bidentata</i> (M)	1	10	76	44	81	214	12	12
<i>Mediomastus fragilis</i> (P)	6	8	57	40	48	88	59	111
<i>Tritaeta gibbosa</i> (M)	-	353	-	-	-	-	-	17

P = Polychaete / C = Crustacean / M = Mollusc / E = Echinoderm

### *Biotopes*

4.2.6 From the taxa identified in the grab samples three infaunal biotopes were ascribed:

- **SS.SMX.CMx.OphMx - *Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment.** This biotope was present at site G01, the most northerly grab site. Here the community was dominated by the brittlestar *Ophiothrix fragilis*. Other species present which are typical of this biotope included the bivalve mollusc *Abra alba*.
- **SS.SMX.Imx.SpavSp.An - *Sabella pavonina* with sponges and anemones on infralittoral mixed sediment.** This biotope was recorded at site G02 where the polychaete *Sabella pavonina* was present. The brittlestar *Amphipholis squamata* and anemones were also common.
- **SS.SCS.CCS.MedLumVen - *Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel.**

This biotope was recorded at the majority of grab sites (G03 to G08). The communities at these sites were relatively diverse and abundant with an average of 113 taxa and 1607 individuals per 0.3 m<sup>2</sup>. The polychaete *Mediomastus fragilis* was common at all sites while venerid bivalve molluscs such as *Venerupis corrugata* and *Timoclea ovata* were also ubiquitous at these sites. Other species typical of this biotope included the brittlestar *Amphopholis squamata* and the polychaete *Sphaerosyllis bulbosa*.

### Conservation Features

- 4.2.7 No specific species of conservation importance were recorded. However, one broad habitat was identified – ‘Subtidal Sands and Gravels’ which features on the Environment (Wales) Act 2016 S7 list (see above). The following biotope recorded from the grab samples is a constituent of this broad habitat:
- 4.2.8 SS.SCS.CCS.MedLumVen - *Mediomastus fragilis*, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel (GB03 – GB08).

## 4.3 SURVEY RESULTS SUMMARY

- 4.3.1 The most northerly section of the survey area was characterised by rocky substrata, as indicated by the drop-down camera images at site DD01, where the substrata comprised boulders and cobbles, interspersed with coarse sand, gravel and shell. Elsewhere, the substrata were predominantly coarse sediments with cobbles, as evidenced from both the drop-down camera images and the grab samples. NRW data indicates that these patches of habitat are generally closer to the mean low water mark, rather than being located in the central areas of the Strait.
- 4.3.2 The images of the epifaunal communities showed strong tidal flows throughout the survey area with erect species clearly streaming in the currents. At DD01 the lack of any erect species and dominance of species resistant to tidal scour indicated the extreme conditions at this point of the Menai Strait. Elsewhere, the epifaunal communities reflected a lower tidal current energy, although the minimal amount of fine sediments present showed that the tidal current regime, while less extreme than at DD01, remains relatively high throughout the survey area. The infaunal communities were characteristic of the sediments present with communities identified typical of the coarse, mixed sediments which comprised the majority of the subtidal habitats.

- 4.3.3 In relation to the Environment (Wales) Act 2016 S7 list, four communities of conservation significance were recorded. Three of these were constituents of the broad habitat 'subtidal sands and gravels' and the other a component biotope of the broad habitat 'tidal swept channels.' Although the Environment (Wales) Act 2016 S7 broad habitat 'subtidal sands and gravels' could be considered to crossover with the Annex I habitat 'sandbanks that are slightly covered by seawater all the time,' the biotopes recorded during the subtidal survey do not really meet the criteria of distinct banks. Indeed, this feature tends to be found to the north-east of the Menai Strait SAC (e.g. Four Fathom Banks complex), a distance beyond the margins of the survey area.
- 4.3.4 A primary reason for designation of the Menai Strait SAC is the presence of the Annex I habitat rocky reefs. The rocky habitat recorded immediately to the west of the Britannia Bridge can be considered to be part of this Annex I habitat. However, the remainder of the area surveyed did not match the description of rocky reefs and though patches of cobbles were observed, the communities found were typical of mixed coarse sediments.
- 4.3.5 The survey has provided a clearer indication of the presence and extent of conservation features in the area of the Menai Strait surveyed. The survey work has shown that a number of S7 habitats are present within survey area; however, the presence of the subtidal Annex I habitats is only really apparent close the Britannia Bridge.

## 5 Conclusion

- 5.1.1 The subtidal environments between the Britannia Bridge and Y Felinheli/Moel-y-don primarily comprised mixed coarse sediment habitats. Immediately to the west of the bridge Annex I rocky reef habitat dominated the seabed. The remainder of the area surveyed did not match the description of rocky reefs and though patches of cobbles were observed, the communities found were typical of mixed coarse sediments.
- 5.1.2 A short distance to the west, the substrata changes to one characterised by coarse sediments. Towards Y Felinheli the sediments remained predominantly coarse, although a greater proportion of fine material was evident. Further west beyond Y Felinheli the sediments were predominantly sandy in character.
- 5.1.3 The communities present were typical of the biogeographical area and were influenced primarily by natural environmental factors such as substratum and the strong tidal flows.
- 5.1.4 The Annex I habitat 'reefs' was evident at the eastern end of the survey area, and four communities of conservation importance under the Environment (Wales) Act 2016 (S7 habitats) were distributed at various locations throughout the survey area.
- 5.1.5 Although not surveyed, the subtidal habitats to the east between the Britannia and Menai Bridges are dominated by Annex I rocky reef habitat. The strong tidal currents and the limestone reef result in a diverse and unique marine community.

## 6 References

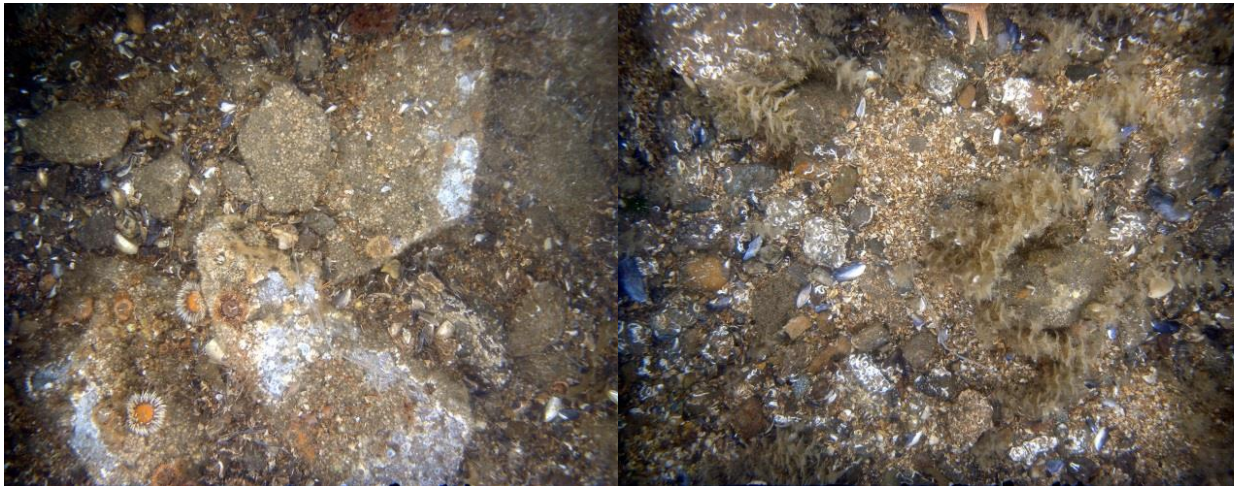
Ref 1: Welsh Government (2016); Planning Policy Wales Edition 9 – November 2016. <http://gov.wales/docs/desh/publications/161117planning-policy-wales-edition-9-en.pdf>

Ref 2: IACC and Gwynedd Council (2017); Anglesey and Gwynedd Joint Local Development Plan 2011-2026

Ref 3: Connor, D.W., Allen, J.H, Golding, N., Howell, K., Lieberknecht, L.M., Northen, K.O., and Reker, J.B., (2004); The Marine Habitat Classification for Britain and Ireland Version 04.05. JNCC, Peterborough.

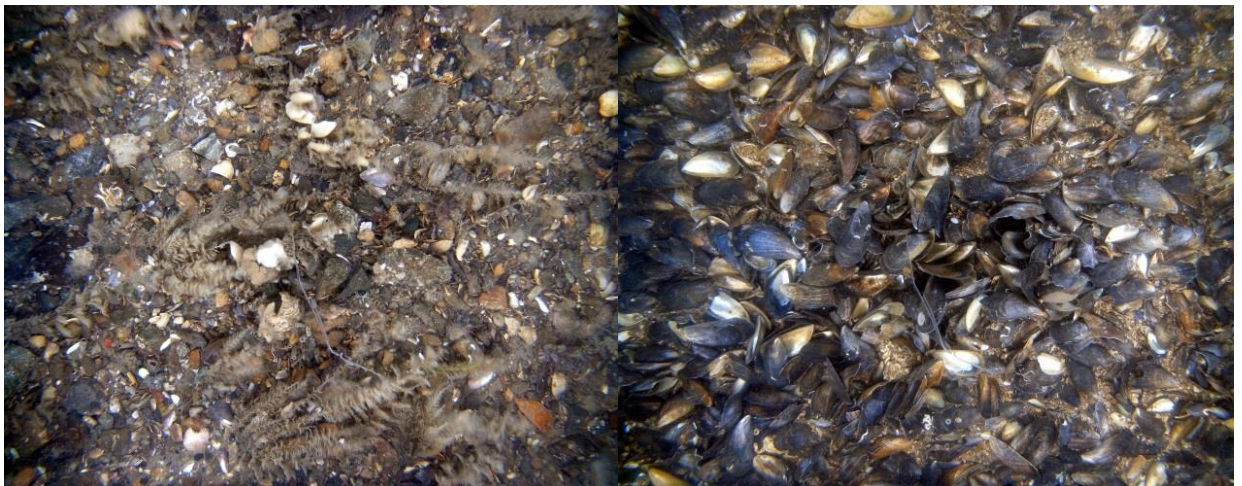


## Appendix A: Photographs and Species Lists



**Plate 1. Rocky reef at site DD01.**

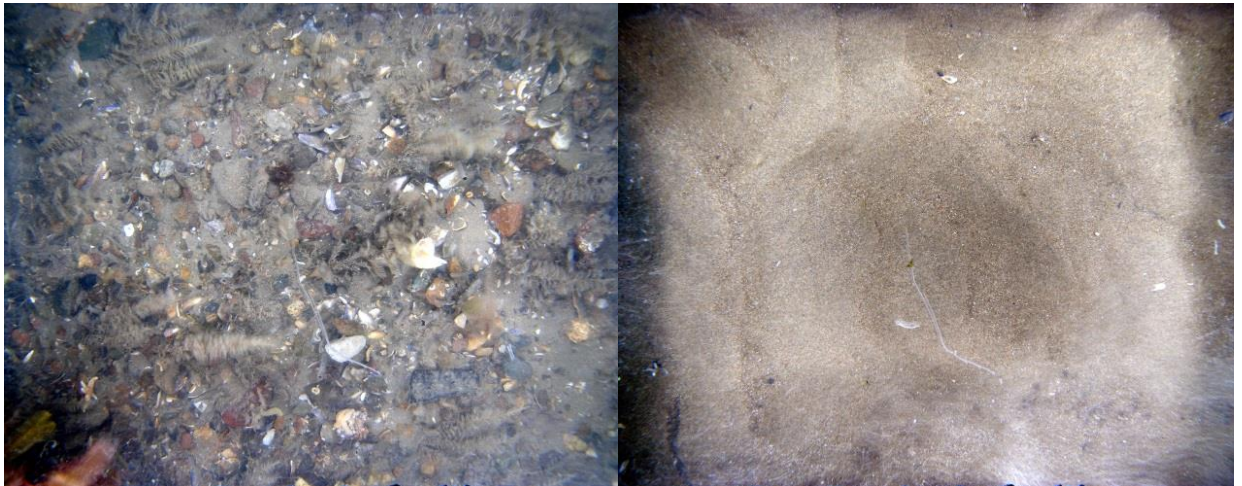
**Plate 2. Mixed coarse sediment at site DD03.**



**Plate 3. Mixed sediment at site DD09.**

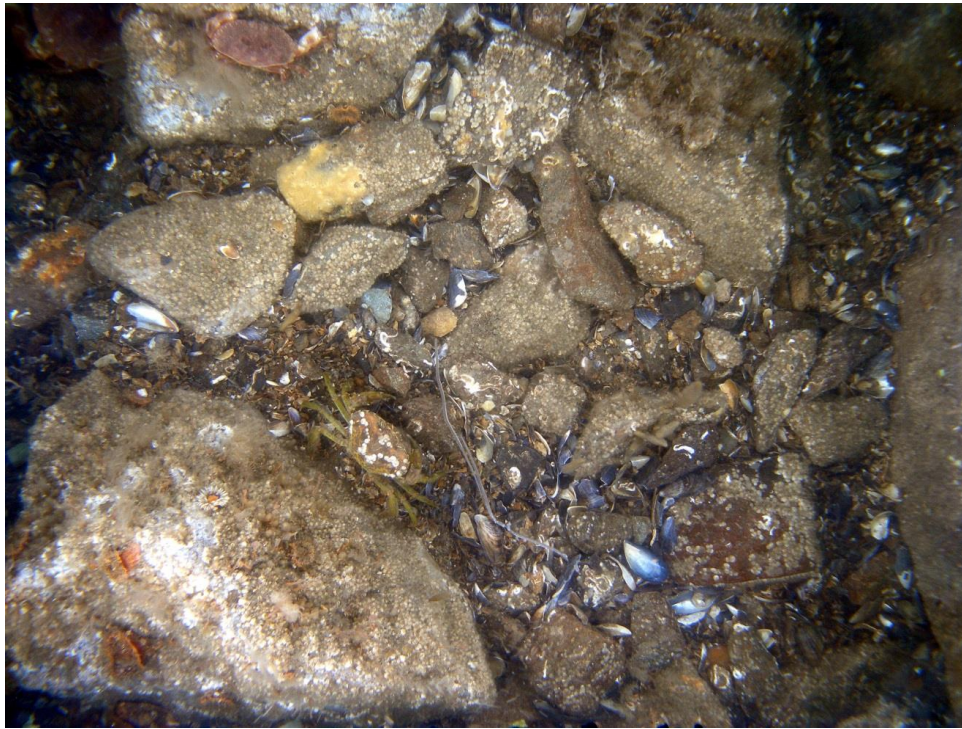
**Plate 4. Broken shell and mixed sediment at site DD05.**





**Plate 5. Mixed sediment with muddy sand at site DD13**

**Plate 6. Mobile sand to south of Y Felinheli.**

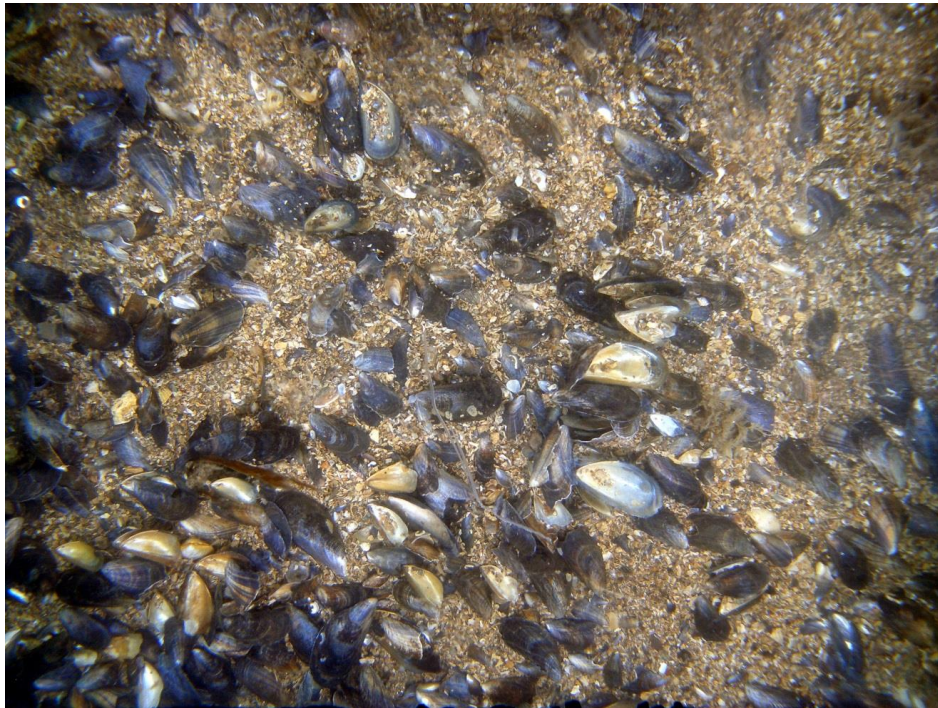


**Plate 7. CR.HCR.FaT.BalTub - rocky reef at site DD01 .**



**Plate 8. SS.SSa.IFiSa.ScupHyd - coarse sediment at site DD04**





**Plate 9. SS.SCS.ICS - coarse sediments with mussel shells at site DD05.**

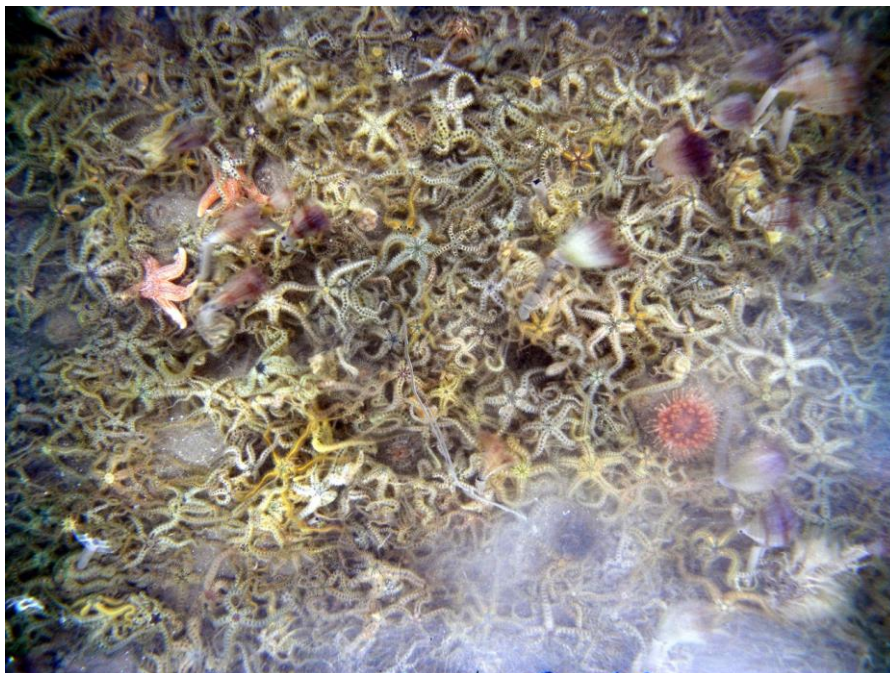


**Plate 10. SS.SMX.CMx.OphMx - brittlestar bed at site DD08.**





**Plate 11. SS.SMX.Imx.SpavSp.An - coarse sediments at site 11.**



**Plate 12. Combination of SS.SMX.CMx.OphMx and SS.SMX.Imx.SpavSp.An at site DD12.**

**Table A1: Relative abundance of biota identified from drop-down camera images.**

Taxon	D D0 1	D D0 2	D D0 3	D D0 4	D D0 5	D D0 6	D D0 7	D D0 8	D D0 9	D D1 0	D D1 1	D D1 2	D D1 3
Actiniaria indet.	F			2		F			F				
<i>Alcyonidium diaphanum</i>	O	O									O		
Porifera indet.		O	O	O					0	0			
<i>Asterias rubens</i>		C	C	C		C	C	C	C	C	A	C	C
<i>Balanus crenatus</i>													
Cirrepedia	C												
Cirrepedia spat.			0										
Ophiuroidea								S	C	C		S	
Bryozoa indet.						O							
<i>Cancer pagurus</i>	A												
<i>Cerianthus lloydii</i>									C	C			C
<i>Esperiopsis fucorum</i>											R		
<i>Flustra foliacea</i>			0										
<i>Halichondria panicea</i>	0	R					0			0	R		
<i>Halichondria bowerbanki</i>							R				R		
<i>Haliclona oculata</i>		O											
Hydroids indet. cf <i>Tubularia indivisa</i>	O	O							O		O		
<i>Hydrallmania falcata</i>	O	O	C	C	0	O	F		C	F	F	0	C
<i>Liocarcinus depurator</i>	A												
<i>Nemertesia</i> spp.		O											
Serpulidae	R	R	F	R	R	R	R		R				
<i>Sabella pavonina</i>											C	A	
<i>Sagartia elegans</i>	A					C	A	A	C	C	C	A	C
<i>Scypha ciliata</i>		F		C			F		F		F		C
<i>Sertularia argentea</i>		C	F				O		0	O	O		
<i>Sertularia cupressina</i>				O			0		O	O	O		O
<i>Urticina felina</i>		C		C				C	C	C		C	

**Table A2. Biota identified from grab samples (numbers per 0.03 m<sup>2</sup>).**

Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
Animalia #eggs	P				P	P	P	P
Porifera	P	P		P	P	P		P
<i>Sycon ciliatum</i>			2		5		1	7
Hydrozoa							P	
Eudendrium					P			
Sertulariidae	P				P	P	P	P
<i>Hydrallmania falcata</i>	P		P	P	P	P	P	P
Campanulariidae					P	P	P	P
<i>Cerianthus lloydii</i>			1	13	5	7	9	1
Actiniaria	31	42	13	1	12	1	4	7
<i>Edwardsia claparedii</i>		14	37	2	75	34	31	
Turbellaria								1
Nemertea		18	25	37	8	45	9	47
Pedicellina						P		
Sipuncula	1		4	43	11	52	31	2
<i>Golfingia (Golfingia) elongata</i>				1				1
<i>Golfingia (Golfingia) vulgaris vulgaris</i>								1
<i>Phascolion (Phascolion) strombus strombus</i>						2		
<i>Pisione remota</i>						2	1	
Polynoidae	4	29	17	14	4	27	8	67
<i>Gattyana cirrhosa</i>		5	3	11	3	1	2	4
<i>Malmgrenia andreapolis</i>				1				
<i>Malmgreniella darbouxi</i>			1	2		2		
<i>Harmothoe fernandi</i>		2				1		1
<i>Lepidonotus squamatus</i>		4	1		3			3
<i>Pholoe baltica</i>	17	4	66	4	84	9	99	47
Sigalionidae		6						
Sigalionidae #juv	1	14	2	1	5			
<i>Sthenelais boa</i>	1	4	1	3	4	1		
Phyllodocidae	1							
<i>Eteone longa</i> #agg	6	3	2	11	9	17	2	48
<i>Mysta picta</i>	1							
<i>Pseudomystides limbata</i>				1				
<i>Phyllodoce mucosa</i>	1	2	1		1			1
<i>Eulalia aurea</i>	2							
<i>Eulalia ornata</i>	1	1						
<i>Eulalia viridis</i>		2						

Table A2. Biota identified from grab samples (numbers per 0.03 m <sup>2</sup> ).								
Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
<i>Eumida</i> sp.			1					
<i>Eumida bahusiensis</i>		1		3				
<i>Eumida sanguinea</i>		3	7	2	8		1	14
<i>Glycera lapidum</i> #agg				1		4	3	3
<i>Glycera tridactyla</i>	2	1		1				
Goniadidae #juv				1				
<i>Ephesiella abyssorum</i>			2	3	2	1	2	1
<i>Sphaerodoropsis minuta</i>								1
<i>Sphaerodorom gracilis</i>	7	4			2		1	
<i>Psamathe fusca</i>		2	4	8	8	7	9	17
<i>Syllidia armata</i>				3				3
Syllidae #epitoke		1	1					
<i>Syllis gracilis</i>	1	3	4	1	4			3
<i>Syllis armillaris</i>		2				1		
<i>Eusyllis blomstrandii</i>	2	17	7	3	7	7	6	16
<i>Odontosyllis gibba</i>		3	3	4	3			4
<i>Salvatoria clavata</i>								1
<i>Salvatoria swedmarki</i>				1				
<i>Exogone dispar</i>			1				2	5
<i>Parexogone hebes</i>			1					
<i>Prosphaerosyllis giandoi</i>					2			
<i>Prosphaerosyllis laubieri</i>						5		
<i>Sphaerosyllis bulbosa</i>			5	35	29	568	386	161
<i>Erinaceusyllis cryptica</i>						1		
<i>Erinaceusyllis erinaceus</i>				2		7		1
<i>Sphaerosyllis hystrix</i>			4	3	3	2	2	1
<i>Sphaerosyllis taylori</i>			6	22	1	6		2
Autolytinae	1	3	2		2	5		9
Nereididae #juv		6	5	2	1	3		
<i>Eunereis longissima</i>				5				1
<i>Platynereis dumerilii</i>		4			5	1		4
Orbiniidae #juv			1					
<i>Scoloplos (Scoloplos) armiger</i>	2							
<i>Nephtys</i> #juv	2							
<i>Nephtys hombergii</i>		1				1		
<i>Lumbrineris aniara/cingulata</i>		1		1	1	1		1
<i>Protodorvillea kefersteini</i>			4	5	1			1
<i>Schistomeringos neglecta</i>				1	1			
<i>Orbinia sertulata</i>							1	

Table A2. Biota identified from grab samples (numbers per 0.03 m <sup>2</sup> ).								
Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
<i>Paradoneis lyra</i>		1	1		1			
Spionida #juv			1					
<i>Aonides oxycephala</i>	1	12	1	1	28	71	13	297
<i>Aonides paucibranchiata</i>			2	32	1	75	91	56
<i>Laonice</i> #juv			3			1	3	1
<i>Laonice bahusiensis</i>				1		7	5	7
<i>Malacoceros tetracerus</i>		1			1	2		
<i>Scolelepis fuliginosa</i>			2	4	14	1	1	
<i>Dipolydora coeca</i> #agg	2	18	3	2		3	1	12
<i>Dipolydora caulleryi</i>		1			1			2
<i>Pseudopolydora antennata</i>			1					
<i>Pseudopolydora pulchra</i>		2						
<i>Spio armata</i> #agg		2		4	7			
<i>Aphelochaeta</i> sp.A		2						
<i>Aphelochaeta marioni</i>				1	2			
<i>Caulleriella alata</i>		2		1				
<i>Caulleriella viridis</i>					1			
<i>Cirriformia</i> #juv	4	7	3		2	3	1	
<i>Cirriformia tentaculata</i>		1	3		3	1	1	1
<i>Tharyx killariensis</i>	2					1		
<i>Mediomastus fragilis</i>	6	8	57	4	48	88	59	111
<i>Notomastus</i> sp.		7	3	6	13			6
Maldanidae						1		
Clymenura					1			
<i>Leiochone johnstoni</i>				1				
<i>Euclymene oerstedii</i>	3	5						
<i>Euclymene</i> sp.A	6	1						
<i>Ophelina acuminata</i>							1	
<i>Asclerocheilus intermedius</i>								1
<i>Scalibregma inflatum</i>		1						
<i>Galathowenia oculata</i>	9	4		2	1	2		
<i>Owenia fusiformis</i>	59	33	4	3	1	3		
Pectinariidae #juv		1	2				1	
<i>Lagis koreni</i>	4	8		1	1			
<i>Sabellaria spinulosa</i>		1		1		1	1	
<i>Ampharete lindstroemi</i>		2			1			
Terebellidae #juv		3	1	1	6	15	9	6
<i>Lanice conchilega</i>	1	12		1	8	6	1	11
<i>Nicolea venustula</i>					1			



**Table A2. Biota identified from grab samples (numbers per 0.03 m<sup>2</sup>).**

Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
Polycirrinae	2	4	3	11	11	4	1	3
<i>Polycirrus medusa</i>					1			
<i>Thelepus cincinnatus</i>								1
<i>Jasmineira elegans</i>		1						
<i>Sabella pavonina</i>	5	17	17	1	8	2	4	7
<i>Hydroides norvegica</i>				1				
Serpulidae		2	4		5		2	2
<i>Spirobranchus lamarcki</i>		12	3	16	28	42	45	75
<i>Spirobranchus triqueter</i>		1		9				1
<i>Tubificoides benedii</i>	3	4	8	2				2
<i>Tubificoides pseudogaster</i> #agg		3		1				
<i>Grania</i> sp.	2	1	2	76	8	21		14
Pycnogonida #juv		5			4	2		6
<i>Nymphon brevirostre</i>	83	37	26	1	16	12	6	64
<i>Nymphon brevitarso</i>		1	5					
<i>Achelia echinata</i>	43	25	17		13	24	13	127
<i>Ammothella longipes</i>						1		
<i>Callipallene tiberi</i>		3						1
<i>Anoplodactylus</i> sp.		1						
<i>Anoplodactylus petiolatus</i>		2			2			6
<i>Phoxichilidium femoratum</i>	2		1			1		1
Balanoidea				2	1	13	2	5
Copepoda			1				3	2
Myodocopodia	5	4	1	1	2	2	1	
Amphilocheidae					1			1
<i>Apolochus neapolitanus</i>		4			3			1
<i>Colomastix pusilla</i>		23						
<i>Stenothoe monoculoides</i>								1
<i>Urothoe elegans</i>	1	2		1				
<i>Metaphoxus fultoni</i>				21	14	56	14	3
<i>Lysianassa ceratina</i>	1	16						4
<i>Perrierella audouiniana</i>		34	19		7			
<i>Socarnes erythrophthalmus</i>				2	2		14	18
<i>Iphimedia minuta</i>		5	1					1
<i>Iphimedia obesa</i>		1						
<i>Liljeborgia kinahani</i>								1
<i>Tritaeta gibbosa</i>		353						17
<i>Gammarus locusta</i>							1	
<i>Abludomelita obtusata</i>		17	17	16	55	13	1	5

**Table A2. Biota identified from grab samples (numbers per 0.03 m<sup>2</sup>).**

Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
<i>Cheirocratus assimilis</i>						1		
<i>Megamphopus cornutus</i>				1	9			1
<i>Gammaropsis maculata</i>	2	6			3		2	13
<i>Photis longicaudata</i>						1		
<i>Photis pollex</i>		2						
<i>Erichthonius punctatus</i>	7	432	4		4	9		1
<i>Jassa falcata</i>	1	6			1			4
<i>Microjassa cumbrensis</i>		5			5	9	1	12
Aoridae #female	1	1			4	15		1
<i>Aora gracilis</i>	2				2	6		1
<i>Leptocheirus hirsutimanus</i>			1	7		1	2	
Corophiidae			3		11			4
<i>Apocorophium acutum</i>		1				2		5
<i>Monocorophium sextonae</i>	4	171	6		13	4	2	49
Caprellidae							1	
<i>Caprella equilibra</i>		1			1	1	2	4
<i>Phtisica marina</i>	4	52	1		3	3	2	1
<i>Pseudoprotella phasma</i>	4	6	1		4			3
Hyperiididae							3	
<i>Janira maculosa</i>		31	1		2		1	4
<i>Microjaera anisopoda</i>				1		1		
<i>Munna</i> sp.					1			4
<i>Pseudoparatanaeis batei</i>					1			
<i>Tanaopsis graciloides</i>			1					
<i>Bodotria scorpioides</i>	2	5	5	2	5	8		6
<i>Nannastacus unguiculatus</i>								1
Decapoda #megalopa						1		1
Decapoda #zoea	1	9	1	1			1	1
Hippolytidae #juv		4						
Paguridae #juv					3	2	2	4
<i>Pagurus bernhardus</i>		1						
<i>Pisidia longicornis</i> #agg	2	25	1		13	5		34
<i>Inachus</i> #juv		1						
<i>Inachus leptochirus</i>	1							
<i>Macropodia</i> #juv								1
<i>Macropodia rostrata</i>		1						1
<i>Liocarcinus depurator</i>			1					
Portunidae #juv		8			4	3	3	1
<i>Polyplacophora</i> #juv			2	1	1	1		

Table A2. Biota identified from grab samples (numbers per 0.03 m <sup>2</sup> ).								
Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
<i>Leptochiton asellus</i>	1				1			1
<i>Leptochiton cancellatus</i>	1							
<i>Hanleya hanleyi</i>			7	5	7	1		
Gastropoda					1			
<i>Gibbula</i> #juv			6		7	2	13	1
<i>Gibbula tumida</i>			6	5				
<i>Gibbula cineraria</i>		1	27	3	9	7	4	19
<i>Lacuna parva</i>		2						
<i>Skeneopsis planorbis</i>						1		
<i>Rissoa parva</i>	14	14			7	15		6
<i>Onoba aculeus</i>				1		1		1
<i>Onoba semicostata</i>	1	4	4	8	5	8	2	1
<i>Peringia ulvae</i>	1	3			3	2		
<i>Tricolia pullus</i>		1	1					
<i>Caecum glabrum</i>				22	1	26	3	1
<i>Tornus subcarinatus</i>								1
<i>Trivia monacha</i>						1		1
<i>Euspira catena</i>				1				
<i>Nassarius reticulatus</i> #juv		1						
Opisthobranchia		1		4			1	1
<i>Philine</i> sp.				1				
<i>Dendronotus frondosus</i>		3				2	3	7
<i>Doto</i> sp.	3	4	8	1	26	57	58	79
Goniodorididae								1
Onchidorididae			1		1	1		
<i>Acanthodoris pilosa</i>		3			1			4
<i>Eubranchius farrani</i>								4
<i>Nucula nitidosa</i>						1		
<i>Nucula nucleus</i>	1	1	1	1		1	3	
Mytilidae #juv	1	4	7	21	22	78	7	234
<i>Mytilus edulis</i> #juv	1			1	1	1		
<i>Modiolus modiolus</i> #juv	2		4	8		2		
<i>Musculus subpictus</i>		1						
Pectiniidae #juv	1	2			2	2		5
Anomiidae #juv			1	2	1			1
<i>Lucinoma borealis</i> #juv		2						
<i>Kurtiella bidentata</i>	1	1	76	44	81	214	12	12
Cardiidae #juv				1	1	1	2	1
<i>Mactra stultorum</i> #juv			2			8	2	3

**Table A2. Biota identified from grab samples (numbers per 0.03 m<sup>2</sup>).**

Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
<i>Moerella</i> #juv						1		
<i>Moerella pygmaea</i>				3			1	
<i>Gari tellinella</i>				3		1	5	2
<i>Abra alba</i>	12	22	9	4	9	17	5	2
<i>Chamelea striatula</i> #juv				2				
<i>Timoclea ovata</i>					1	1		
<i>Timoclea ovata</i> #juv			1	1	5	5	1	
<i>Phaxas pellucidus</i>		1						
<i>Phaxas pellucidus</i> #juv		1						
<i>Arcopagia crassa</i>						1		
<i>Venerupis corrugata</i>					1	5	1	
<i>Venerupis corrugata</i> #juv		2	2	4	5	13	6	6
<i>Dosinia</i> #juv			1	8	7	15	3	3
<i>Dosinia exoleta</i>						6	3	
<i>Mysia undata</i> #juv				3				
<i>Mya truncata</i>			2		3	4	2	
<i>Mya truncata</i> #juv	3	66	16	4	55	58	3	28
<i>Mya arenaria</i>							2	
<i>Hiatella arctica</i>	1	1	1					
<i>Thracia</i> #juv					3			
<i>Thracia villosiuscula</i>				7			1	3
<i>Thracia villosiuscula</i> #juv				13		21	5	1
<i>Tubulipora</i> sp.								P
<i>Alcyonidium diaphanum</i>	P	P	P	P	P	P	P	P
<i>Scruparia chelata</i>							P	P
<i>Electra pilosa</i>	P	P	P	P	P	P	P	P
<i>Bicellariella ciliata</i>	P			P	P	P	P	P
<i>Phoronis</i> sp.	31	62	12					
Asteroidea		2		1		1		2
<i>Asterias rubens</i>	2							1
<i>Asterias rubens</i> #juv	1	3	1		1			
Ophiuroidea #juv			2					
<i>Ophiothrix fragilis</i>	422	57	34	4	8		5	
<i>Ophiothrix fragilis</i> #juv	18	7		6				4
<i>Amphipholis squamata</i>	55	18	46	118	71	289	122	12
<i>Psammechinus miliaris</i>			1					1
<i>Echinocyamus pusillus</i>				2				
<i>Thyone fusus</i>				2				
Cucumariidae #juv							3	

**Table A2. Biota identified from grab samples (numbers per 0.03 m<sup>2</sup>).**

Replicate	G0 1	G0 2	G0 3	G0 4	G0 5	G0 6	G0 7	G0 8
<i>Leptosynapta inhaerens</i>	1			131	9	8	24	13
Ascidiacea	3	1		2	P	6	2	7
<i>Pholis gunnellus</i> #juv								1
<i>Callionymus lyra</i> #juv							1	