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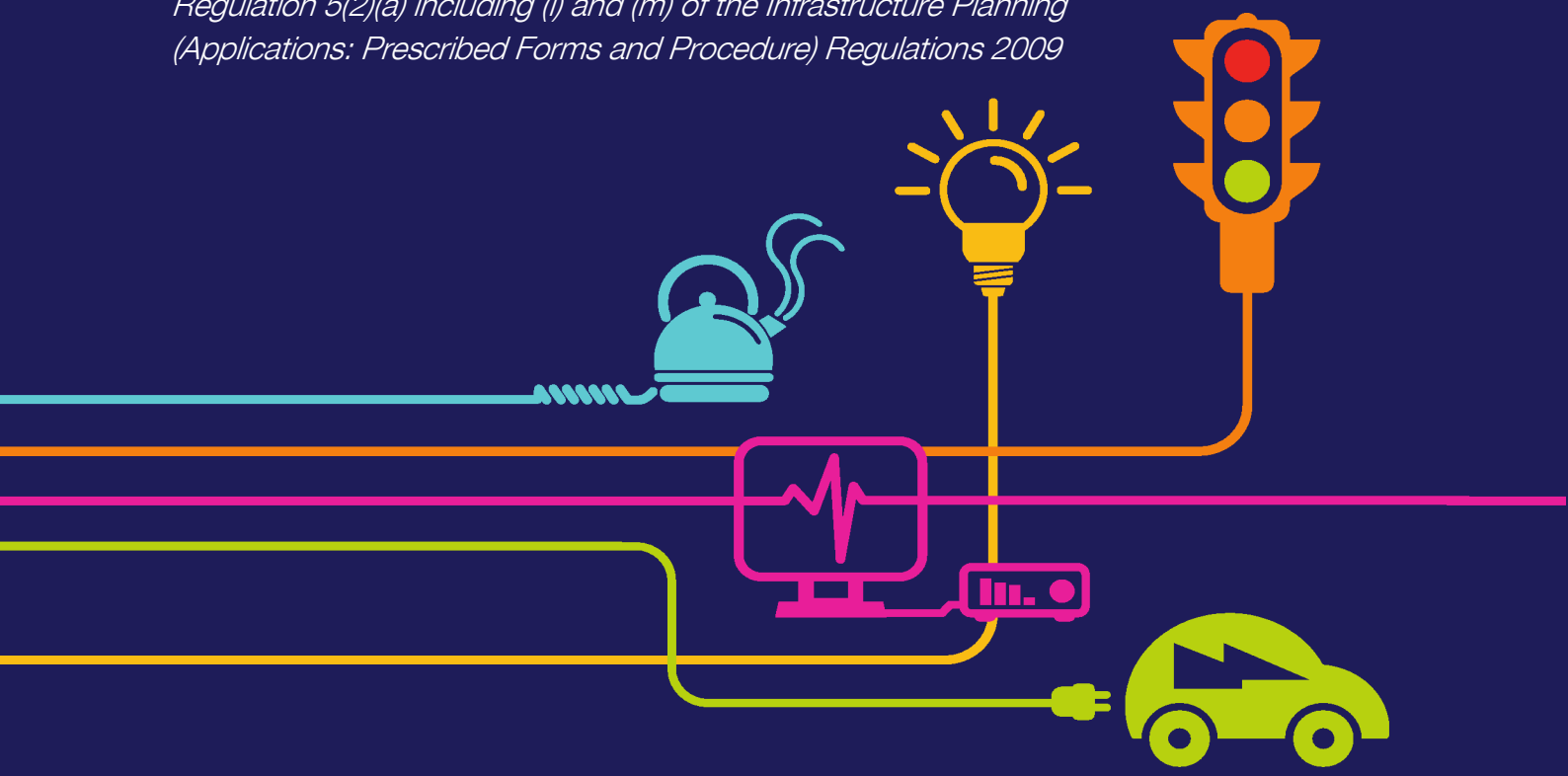
Intertidal Report

Chapter 9 – Appendix 16

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



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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:

- modifications 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 intertidal ecology surveys carried out in July 2015 and presents biotope maps which were generated from the data.

1.1.4 This report also identifies relevant legislation and planning policy relating to marine habitats and species, which are outlined in section 2.

Objectives

1.1.5 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**)).

1.1.6 The aim of the intertidal survey work is to produce a detailed biotope map of the intertidal area throughout the survey area which encompasses the Order Limits. Data collected during the survey will be used to validate the historical biotope mapping undertaken by Countryside Council for Wales (CCW) (Natural Resources Wales (NRW) predecessor) in 2003, and provide an indication of any temporal change. The work will also aim to identify areas of the shore where habitats and/or species of conservation importance exist which will inform the ES as mentioned above. 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 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 polices 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 survey area, as shown in Figure 1, is within the Menai Strait and Conwy Bay SAC which is designated for four Annex I habitat types, three of which are present within the survey area: Reefs, Intertidal Mudflats and Sandflats and Subtidal Sandbanks.

3.1.4 Reefs are present throughout the survey area, particularly in the north-eastern half of the area where this habitat encompasses the majority of subtidal, while further west this habitat is limited to the shallow sublittoral. Intertidal mudflats and sandflats and subtidal sandbanks are present in the southern half of the survey area, particularly towards the north shore. Throughout the majority of the SAC the boundary is the mean low water mark with the only intertidal habitats included being the area encompassed by the Glannau Porthaethwy SSSI, which is located on the Anglesey shore between the Britannia Bridge and the east of Menai Bridge. The survey included the stretch of these intertidal habitats between the Britannia and Menai Suspension Bridges.

3.1.5 The intertidal physical topography varies throughout the survey area from relatively broad, gently shelving habitats in the south-west to more exposed vertical bedrock, particularly on the south shore between the bridges, where tidal currents are severe. The substrata are predominantly rocky, comprising primarily bedrock, boulders and cobbles, although some sedimentary habitats are present in the more sheltered areas, particularly in the western end of Church Bay.

3.2 BIOTOPE SURVEYS

3.2.1 The survey methodologies used were based on 'Procedural Guideline No. 3-1: in situ intertidal biotope recording' (Ref 3). In 2003 CCW carried out a detailed intertidal biotope survey throughout the Menai Strait. The results of this study were used as a baseline for this 2015 survey to determine presence/absence of ascribed biotopes and assess any changes in their extent. The intertidal survey (2015) was used to verify the location and presence of ecological communities previously identified by NRW in 2003 and to provide an up-to-date pictorial representation of the marine biotopes within the survey area.

3.2.2 Surveyors were equipped with Ordnance Survey maps, the NRW 2003 biotope map, a mobile mapper (with GPS) uploaded with relevant OS maps and NRW 2003 biotope map, a handheld GPS, binoculars and a waterproof camera. Within the survey area the entire intertidal area along the north and south shore was walked, with notes taken and edits to the historical biotopes drawn directly onto maps. Features of interest less than 5 m by 5 m were fixed by GPS with target notes made and photos taken.

3.2.3 Key physical and biological characteristics were recorded from the biotopes to allow determination and, in most cases, validation of historically ascribed habitats. It was found that the majority of the intertidal biotopes, as previously listed by NRW in 2003, were present; with many of the characterising flora/fauna of these biotopes confirmed in the field by the surveyors.

3.2.4 Surveys were completed over the period 6 to 8 July 2015. Weather conditions during the survey were appropriate, being generally overcast, interspersed with periods of heavy rainfall.

3.2.5 The extent of the survey area is shown in Figure 1.

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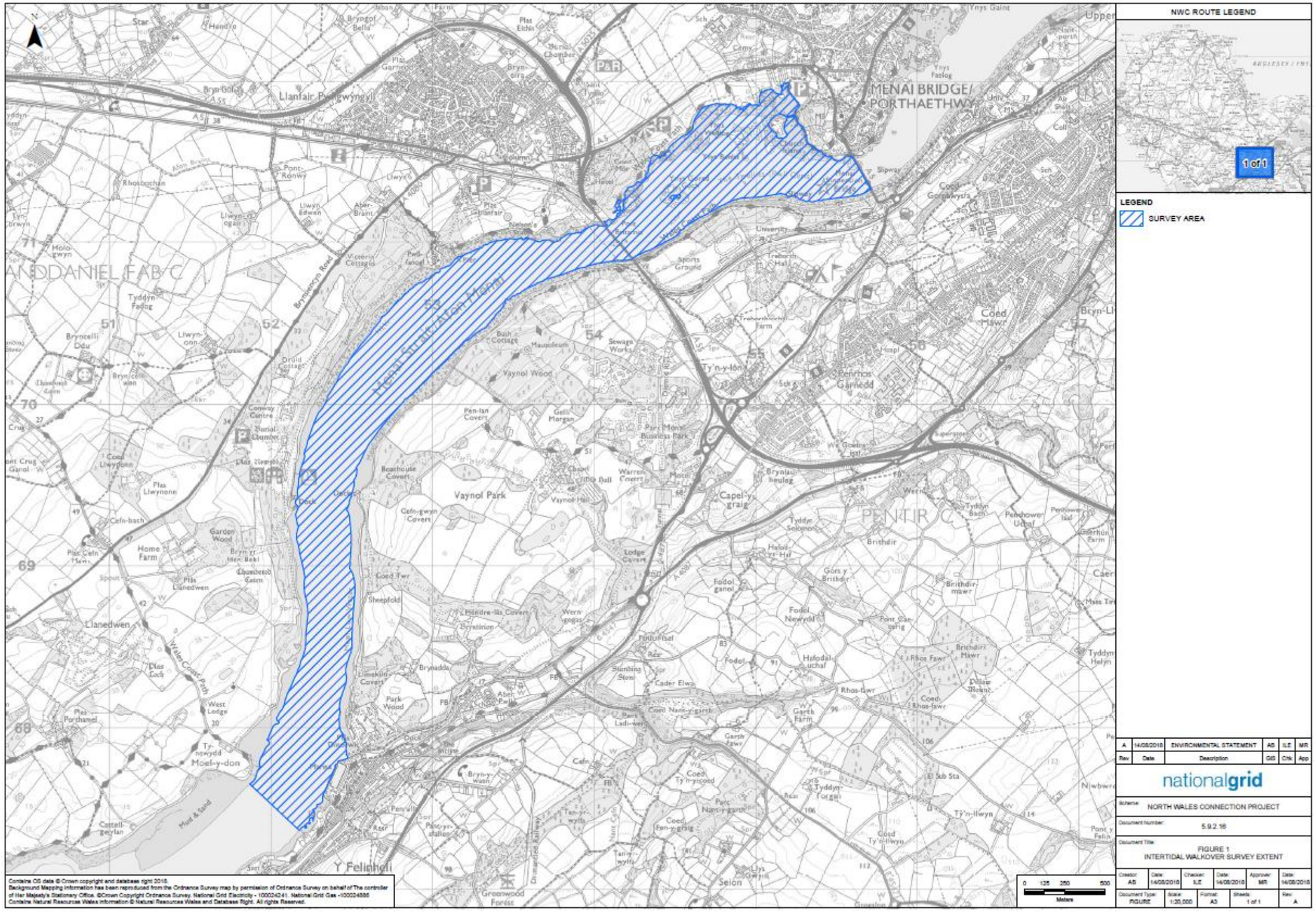

Figure 1: Intertidal Walkover Survey Extent

4 Results

4.1 SHORE MORPHOLOGY

4.1.1 The morphology of the shore varied considerable from relatively wide, gently shelving sedimentary shores to narrow, steep rocky shores, although the majority of the intertidal area was characterised by a mosaic of bedrock, boulders and cobbles with sedimentary habitats limited primarily to the eastern and western ends of the survey area.

Mainland Shore

Menai Suspension Bridge to Britannia Bridge (Plates 1 – 4)

4.1.2 The stretch of the mainland shore between the bridges was narrow with predominantly exposed bedrock with some areas of boulders and cobbles. Through much of the area, the upper shore comprised steep bedrock and while the mid-shore was characterised by relatively flat bedrock the low shore was also steep, falling rapidly toward the infralittoral zone. Throughout this stretch the shore was backed by steep woodland. Tidal flows here are generally high resulting in areas of sparse macroalgal cover where exposure levels are particularly extreme. However, gullies and ravines and other less exposed areas supported dense macroalgal cover composed primarily of fucoids.

Britannia Bridge to Y Felinheli (Plates 5 - 10)

4.1.3 Immediately to the west of the Britannia Bridge the upper shore was characterised by steep bedrock while the mid and lower shores were more gently shelving with boulders and cobbles dominating the rocky substrata. The upper shore here was backed by relatively steep woodland. However, within 750 m of the Britannia Bridge the intertidal widened with the gradient softening and the substrata characterised by a mosaic of boulders, cobbles and gravel interspersed with areas of sand and mud. The shore here was backed by areas of barren gravel and grassland with a stone wall which extended along the length of the Vaynol Estate northern boundary. Toward Y Felinheli the shore was backed by a slate seawall with housing behind. Between the southern end of the Vaynol Estate wall and the slate seawall, the upper shore was backed by woodland and coastal pasture on relatively gently sloping land.

4.1.4 At Y Felinheli, immediately to the south of the mouth of the Nant y Garth, the harbour extended through the intertidal zone. The bay to the south of the harbour was a mosaic of sandy muds, gravels and cobbles backed by a concrete seawall. The land behind the dock was built up with residential development, while behind the seawall to the south the land was given over to amenity grassland and residential development.

4.1.5 Throughout this stretch of the survey area rocky substrata in the mid and low shore zones were characterised by relatively dense macroalgal cover, while macroalgal cover was sparse within the upper shore area.

Anglesey Shore

Menai Suspension Bridge to the Britannia Bridge (Church Bay – Plates 11 and 12)

4.1.6 On Anglesey the shore between the two bridges comprised a mosaic of sediments, boulders, bedrock and cobbles. Immediately to the west of the Menai Suspension Bridge the shore was relatively steep and predominantly rocky in nature and was backed by steep ground given over to residential housing. Church Bay itself was characterised by a number of small, low lying tidal islands interspersed by broad areas of muddy sand with some boulders, cobbles and gravel present. Church Bay was backed by gently sloping coastal grassland utilised for grazing. To the west of Church Bay the intertidal area was again steep and rocky and backed by steeply rising woodland and scrub.

Britannia Bridge to Moel-y-don (Plates 13 - 18)

4.1.7 Between the Britannia Bridge and Moel-y-don the intertidal zone was characterised predominantly by boulders and cobbles. These habitats were relatively broad and gently shelving, supporting dense macroalgal cover. Some areas of sedimentary substrata were present, particularly to the south-west at Moel-y-don and in the embayments at Pwll fanogl and Llwyn Chwarel-goch. The sedimentary habitats at Moel-y-don were relatively extensive and were interspersed with areas of cobbles and gravel. At Pwll fanogl the area of sediments was limited to the small quay at the mouth of the Afon Braint, while at Llwyn Chwarel-goch the area of muddy sediment was limited to the extent of the small embayment. Throughout the majority of this stretch of the survey area the shore was backed by gently rising woodland and scrub. However, at Plas Newydd in the vicinity of the manor house, the shore was backed by a stone seawall. At Pwll fanogl a number of residential properties were directly above the quay in addition to an outward bounds centre immediately to the east of the hamlet. A sewage works was located on the slope above Pwll fanogl.

4.2 BIOTOPES

4.2.1 A total of 59 intertidal biotopes were present within the survey area covering a total of 93.9 ha. A list of all the biotopes (according to Ref 4) found in 2015 is given in Appendix A (Table A1). Throughout the study area the most dominant communities, in terms of extent, were those characterised by fucoid algae and the egg wrack (*Ascophyllum nodosum*), which accounted for more than 56% of the intertidal assemblages. Throughout the survey area the shores showed characteristic vertical zonation patterns typical of rocky marine habitats.

4.2.2 In the upper shore the most dominant biotopes were LR.LLR.F.Fspi.FS (*Fucus spiralis* on full salinity moderately exposed to very sheltered upper eulittoral rock) and LR.LLR.F.Pel (*Pelvetia canaliculata* on sheltered littoral fringe rock). These biotopes are characterised by algal species typical of upper littoral zones on rocky substrata. The lichen dominated biotopes LR.FLR.Lic.YG (Yellow and grey lichens on supralittoral rock) and LR.FLR.Lic.Ver.Ver (*Verrucaria maura* on very exposed to very sheltered upper littoral fringe rock) were typical on rocks and boulders in the supralittoral zone.

4.2.3 Mid shore areas were typified by the biotopes LR.LLR.F.Asc.X (*Ascophyllum nodosum* on full salinity mid eulittoral mixed substrata).

4.2.4 The *F. serratus* biotope LR.LLR.F.Fserr.X (*Fucus serratus* on full salinity lower eulittoral mixed substrata) was characteristic of much of the low shore where the biotope IR.MIR.KT.LdigT (*Laminaria digitata*, ascidians and bryozoans on tide-swept sublittoral fringe rock) was relatively common. Other kelp dominated biotopes present in the extreme low shore included IR.MIR.KR.Ldig.Bo (*Laminaria digitata* and under-boulder fauna on sublittoral fringe boulders).

4.2.5 The distribution of the biotopes is illustrated in Figure 2.

4.2.6 The most common biotope, representing 25% of the survey area, was LR.LLR.F.Asc.X (*Ascophyllum nodosum* on full salinity mid eulittoral mixed substrata) which occurred throughout the study area covering 27.3 ha (Table 4.1). The coverage of the biotope LR.LLR.F.Fserr.X (*Fucus serratus* on full salinity lower eulittoral mixed substrata) extended to 10.2 ha, representing 11% of the survey area. These two biotopes characterised much of the boulder and cobble habitats throughout the mid and low shore. Where the mid and low shore were characterised by rock the same species were prevalent with the biotopes LR.LLR.F.Asc.FS (*Ascophyllum nodosum* on full salinity mid eulittoral rock) and LR.HLR.FT.FserTX (*Fucus serratus*

with sponges, ascidians and red seaweeds on tide-swept lower eulittoral mixed substrata) typical, representing 14% of the survey area between them. The extent of these biotopes is reflected in the area of the corridor characterised by the life forms algal turfs and fucoids as indicated in Figure 3.

4.2.7 Sediment biotopes were also present, particularly to the east of the Britannia Bridge at Church Bay and on both shores in the south-west of the survey area at Y Felinheli and Moel-y-don, and represented about 18% of the intertidal area surveyed. The most common sedimentary biotope was '*Hediste diversicolor, Macoma balthica* and *Eteone longa* in littoral muddy sand' which covered approximately 3.8 ha in Church Bay and at Moel-y-don.

4.2.8 The sediment biotope LS.LMu.UEst.Hed.Ol (*Hediste diversicolor* and oligochaetes in littoral mud) was also common, covering approximately 3 ha of the Anglesey shore at Church Bay, Pwll Fanogl and Llwyn Chwarel-goch, along the upper shore where influence of the freshwater runoff was evident.

Table 4.1: Most common biotopes identified, Menai Strait, July 2015.

Biotope Code	Biotope Description	Extent (ha)	Proportion of Survey Area (%)
LR.LLR.F.Asc.X	*Ascophyllum nodosum* on full salinity mid eulittoral mixed substrata	23.70	25.26
LR.LLR.F.Fserr.X	*Fucus serratus* on full salinity lower eulittoral mixed substrata	10.18	10.85
LR.LLR.F.Asc.FS	*Ascophyllum nodosum* on full salinity mid eulittoral rock	7.01	7.47
LR.LLR.F.Fspi.FS	*Fucus spiralis* on full salinity moderately exposed to very sheltered upper eulittoral rock	6.07	6.46
LR.HLR.FT.FserTX	*Fucus serratus* with sponges, ascidians and red seaweeds on tide-swept lower eulittoral mixed substrata	5.90	6.29
LR.LLR.F.Pel	*Pelvetia canaliculata* on sheltered littoral fringe rock	3.86	4.12

Table 4.1: Most common biotopes identified, Menai Strait, July 2015.			
Biotope Code	Biotope Description	Extent (ha)	Proportion of Survey Area (%)
LS.LSa.MuSa.HedMac Ete	*Hediste diversicolor, Macoma balthica* and *Eteone longa* in littoral muddy sand	3.83	4.08
IR.MIR.KT.LdigT	*Laminaria digitata*, ascidians and bryozoans on tide-swept sublittoral fringe rock	3.74	3.99
LR.MLR.BF.Fser.R	*Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock	3.07	3.27
LS.LMu.UEst.Hed.Ol	*Hediste diversicolor* and oligochaetes in littoral mud	3.03	3.23

4.3 CONSERVATION FEATURES

4.3.1 No specific species of conservation importance were recorded. However, five broad habitat features were recorded that are included within the Environment (Wales) Act 2016 S7 list. These and the constituent biotopes which were identified in the survey area are provided in Table 4.2.

Table 4.2: Conservation features identified, Menai Strait, July 2015.		
Biotope Code	Biotope Description	Location/Extent
Intertidal Boulder Communities		
LR.MLR.BF.Fser.Bo	*Fucus serratus* and under-boulder fauna on exposed to moderately exposed lower eulittoral boulders	Present on the Anglesey shore particularly in Church Bay and to the south of Plas Newydd boathouse.
IR.MIR.KR.Ldig.Bo	*Laminaria digitata* and under-boulder fauna on sublittoral fringe boulders	This biotope was present on the mainland shore between the bridges and also on the Anglesey shore in Church Bay in total covering 2.0 ha.
Tide Swept Channels		

Table 4.2: Conservation features identified, Menai Strait, July 2015.		
Biotope Code	Biotope Description	Location/Extent
IR.MIR.KT.LdigT	*Laminaria digitata*, ascidians and bryozoans on tide-swept sublittoral fringe rock	This biotope was common on both shores between the bridges covering a total of 3.7 ha.
LR.HLR.FT.AscT	*Ascophyllum nodosum*, sponges and ascidians on tide-swept mid eulittoral rock	This biotope was recorded in Church Bay with a total coverage of 0.01 ha.
LR.HLR.FT.FserT	Fucus *serratus*, sponges and ascidians on tide-swept lower eulittoral rock	This biotope extended to 1.4 ha and was recorded predominantly in Church Bay.
LR.HLR.FT.FserTX	*Fucus serratus* with sponges, ascidians and red seaweeds on tide-swept lower eulittoral mixed substrata	This was recorded throughout the survey area covering an extent of 5.9 ha.
Coastal Saltmarsh		
LS.LMp.Sm	Saltmarsh	This biotope covered a total of 1.1 ha with the majority recorded in Church Bay, although small areas were present on the Anglesey shore at Llwyn Chwarel-goch (NGR 252121 368421) and on the mainland shore to the north-east of Vaynol boathouse (NGR 253126 370226).
LS.LMp.Sm.SM8	*Salicornia* dominated saltmarsh	This biotope was present in one area of 0.06 ha to the south-west of Church Island (NGR 255130 371657).
Intertidal Mudflats		

Table 4.2: Conservation features identified, Menai Strait, July 2015.		
Biotope Code	Biotope Description	Location/Extent
LS.LMu	Littoral mud	This biotope covered 8.7 ha at Y Felinheli with the one small area (0.004 ha) north of Vaynol boathouse (NGR 252669 369781).
LS.LMu.MEst.HedMac Scr	*Hediste diversicolor, Macoma balthica* and *Scrobicularia plana* in littoral sandy mud shores	This biotope extended to 1.7 ha, although it was only recorded at the easterly and westerly extremes of the survey area in Church Bay and at Moel-y-don.
LS.LMu.UEst.Hed.Ol	*Hediste diversicolor* and oligochaetes in littoral mud	This biotope covered 3.0 ha, predominantly in Church Bay, although appreciable areas were present to both the north (252584 369608) and south (NGR 252501 369272) of Vaynol boathouse.
LS.LSa.MuSa.HedMac Ete	*Hediste diversicolor, Macoma balthica* and *Eteone longa* in littoral muddy sand	This biotope extended to 3.8 ha, although it was only recorded at the easterly and westerly extremes of the survey area in Church Bay and at Moel-y-don.
LS.LSa.MuSa.La	*Lanice conchilega* in littoral sand	This biotope was recorded to the north of the Vaynol boathouse and extended to 0.4 ha
LS.LSa.MuSa.MacAre	*Macoma balthica* and *Arenicola marina* in littoral muddy sand	This biotope extended to 0.5 ha with and was recorded in Church Bay and to the south of the Vaynol boathouse.
Sheltered Muddy Gravels		
LS.LMx.GvMu.HedMx	*Hediste diversicolor* in littoral gravelly muddy sand and gravelly sandy mud	One small area totalling 0.05 ha was present on the Anglesey shore to the east of the Britannia Bridge (NGR 254137 371229).

Invasive Non Native Species

4.3.2 The invasive non-native macroalgae wire weed (*Sargassum muticum*) was recorded on the low shore to the west of the Britannia Bridge (NGR 253481 370654) extending to 0.08 ha. This was assigned the biotope IR.LIR.K.Sar (*Sargassum muticum* on shallow slight tide-swept infralittoral mixed substrata). Small stands of *S. muticum* were observed at three further locations on the mainland shore as indicated by target notes 1 – 3 (see Figure 2): one site to the north of Vaynol boathouse and the others to the north of Y Felinheli.

Changes to extent and presence

4.3.3 Generally, only small changes were evident in the distribution of biotopes between 2003 and 2015 with the majority of any such changes being minor changes in biotope extent, often by <5 m. However, a number of more significant changes were evident, although all observed changes were less than 1 ha (Table 4.3). The greatest changes occurred in sediment biotope, particularly in relation to change in designation of sediments at Y Felinheli from LS.LMu.UEst.Hed.Ol (*Hediste diversicolor* and oligochaetes in littoral mud) to LS.LMu (Littoral mud). The biotope assigned in 2003 is described as a species-poor community found in mud or slightly sandy mud in low salinity conditions, typically at the head of estuaries. This description does not apply to Y Felinheli where euhaline conditions exist and there are no freshwater influences, as no cores were collected in 2015 to further assess the biotope, the previous ascription could not be confirmed and consequently the broader biotope LS.LMu (Littoral mud) was assigned.

4.3.4 The biotope LS.LSa.MuSa.La (*Lanice conchilega* in littoral sand) was recorded in 2015 but not in 2003.

4.3.5 The greatest change to rocky shore biotopes was considered a result of the colonisation of the low shore by *Sargassum muticum* (see above) at the expense of the infralittoral kelp dominated biotope IR.MIR.KT.LdigT (*Laminaria digitata*, ascidians and bryozoans on tide-swept sublittoral fringe rock). Other changes were represented by modification of boundaries between the dominant biotopes LR.LLR.F.Asc.X (*Ascophyllum nodosum* on full salinity mid eulittoral mixed substrata) and LR.LLR.F.Fserr.X (*Fucus serratus* on full salinity lower eulittoral mixed substrata).

4.3.6 A small patch of mussels was recorded on slate at Y Felinheli which was recorded as target note 4. However, its extent was < 5 by 5 m and therefore did not meet the criteria for biotope ascription.

4.3.7 All changes in biotope extent are given in Appendix A (Table A2).

Table 4.3: Changes in biotope extent between 2003 and 2015.			
Gain		Loss	
Biotope Code	Change	Biotope Code	Change
LS.LMu	0.876	LS.LMu.UEst.Hed.Ol	-0.990
LS.LSa.MuSa.La	0.400	IR.MIR.KT.LdigT	-0.449
LR.LLR.F.Asc.X	0.371	LR.LLR.F.Fserr.X	-0.404
LR.HLR.FT.FserTX	0.343	LR.LLR.F.Fves	-0.316
LS.LSa.MuSa.Mac Are	0.271	LS.LCS.Sh.BarSh	-0.264

4.4 INTERTIDAL SURVEY RESULTS SUMMARY

4.4.1 The majority of the survey area was characterised by rocky substrata comprising bedrock, boulders and cobbles. The rocky communities were characterised by clear patterns of vertical zonation of species and communities typical of the habitats present. The upper shore was typified by lichens, *Pelvetia canaliculata* and *Fucus spiralis*, with the characteristic species on the midshore being *Ascophyllum nodosum* and fucoids, while *F. serratus* continued in to the low shore with the kelp *Laminaria digitata* common.

4.4.2 Appreciable areas of sedimentary habitats were also present, particularly on the Anglesey shore to the east of Britannia Bridge at Church bay and on both shores (mainland and Anglesey) at the southern end of the survey area at Y Felinheli and Moel-y-don. These sedimentary habitats comprised muddy sands, although small areas of sand and shingle were observed throughout the survey area, particularly on the mainland shore between Y Felinheli and the Britannia Bridge. Sedimentary habitats were characterised by polychaete dominated communities.

4.4.3 In relation to the Environment (Wales) Act 2016 S7 list, 15 communities of special conservation significance were recorded. The majority of these communities were recorded to the east of the Britannia Bridge, particularly intertidal boulder communities, tide swept channels, coastal saltmarsh, intertidal mudflats and sheltered muddy gravels. Tide swept channels were

also recorded throughout the rest of the survey area, while appreciable areas of intertidal mudflats were also recorded on both shores in the most south-westerly extent of the survey area at Y Felinheli and Moel-y-don. Small areas of coastal saltmarsh and intertidal muds were observed in the vicinity of the Vaynol boathouse.

4.4.4 There were some changes evident in the biotopes recorded in 2003 and 2015, although these were relatively small and were related primarily to changes in the biotope rather than presence. All biotopes recorded in 2003 were present in 2015 with four additional biotopes added in 2015. However, of those only recorded in 2015 LS.LMu (Littoral mud) was assigned as a polychaete and oligochaete dominated community (LS.LMu.UEst.Hed.Ol - *Hediste diversicolor* and oligochaetes in littoral mud) which the surveyors were not able to assign. Consequently, this area was assigned the less detailed biotope of LS.LMu (Littoral mud).

4.4.5 The invasive non-native species *Sargassum muticum* was recorded at a number of locations, with one substantial area identified. This species naturally occurs in Japanese and Chinese waters and was first recorded in UK waters on the Isle of Wight in the 1960s but has since spread through the Irish Sea, being recorded as far north as the North Channel between Scottish and Irish coasts. Consequently, although not recorded in 2003, the presence of this species is not completely unsurprising considering its recorded northerly extent in the UK.

4.4.6 It is considered that that many of the minor changes observed in biotope extent are likely to be related to limitations in GPS accuracy rather than indicating definite changes in the biotope extent, as confidence in GPS accuracy lower than 5 m is variable. However, the boundaries of biotopes are rarely clear cut and represent a degree of subjectivity for the surveyor i.e. where one biotope ends and another begins, the transition of these biotopes often being a gradual change rather than a defined boundary line. Within these transitional zones the biological features present are at their natural limits as a result of biological, physical or chemical influences and/or a combination of these. However, it was considered that the resultant map is a robust representation of the distribution of the biotopes present with an acceptable level of confidence.

The marine biotopes recorded within the study area represented a diverse range of communities, typical for this biogeographic area. Among the communities found were a number of marine habitats recognised for their contribution to UK and Welsh biodiversity. The low level of variability between the 2003 and 2015 description of the biotopes present and their

distribution indicate the stability of the communities present within the survey area over this period and would indicate that both natural and anthropogenic influences have not appreciably altered these communities over this period. Consequently, it is considered that the data represents a robust baseline against which the influence of the Proposed Development can be assessed.

5 Conclusion

5.1.1 The intertidal environments between Y Felinheli/Moel-y-don and the Menai Suspension Bridge comprised a mosaic of habitats including, exposed bedrock, boulders, cobbles and sediments, although rocky substrata dominated.

5.1.2 The communities present were typical of the biogeographical area and were influenced primarily by natural environmental factors such as substratum, exposure and tidal height.

5.1.3 The communities present in 2015 showed some variation from those recorded in 2003, although most changes were small and it was therefore considered that the communities are relatively stable.

5.1.4 Fifteen communities of conservation importance were identified with the distribution primarily limited to the north-eastern and south-western extremes of the survey area, particularly Church Bay.

5.1.5 The non-native wire weed (*Sargassum muticum*) was present on the mainland shore.

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: Wyn, G., Brazier, D. P., McMath, A. J. (2000); NRW handbook for marine intertidal Phase 1 survey and mapping. NRW Marine Sciences Report: 00/06/01.

Ref 4: 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: Biotope Figures, Photographs and Biotopes Recorded

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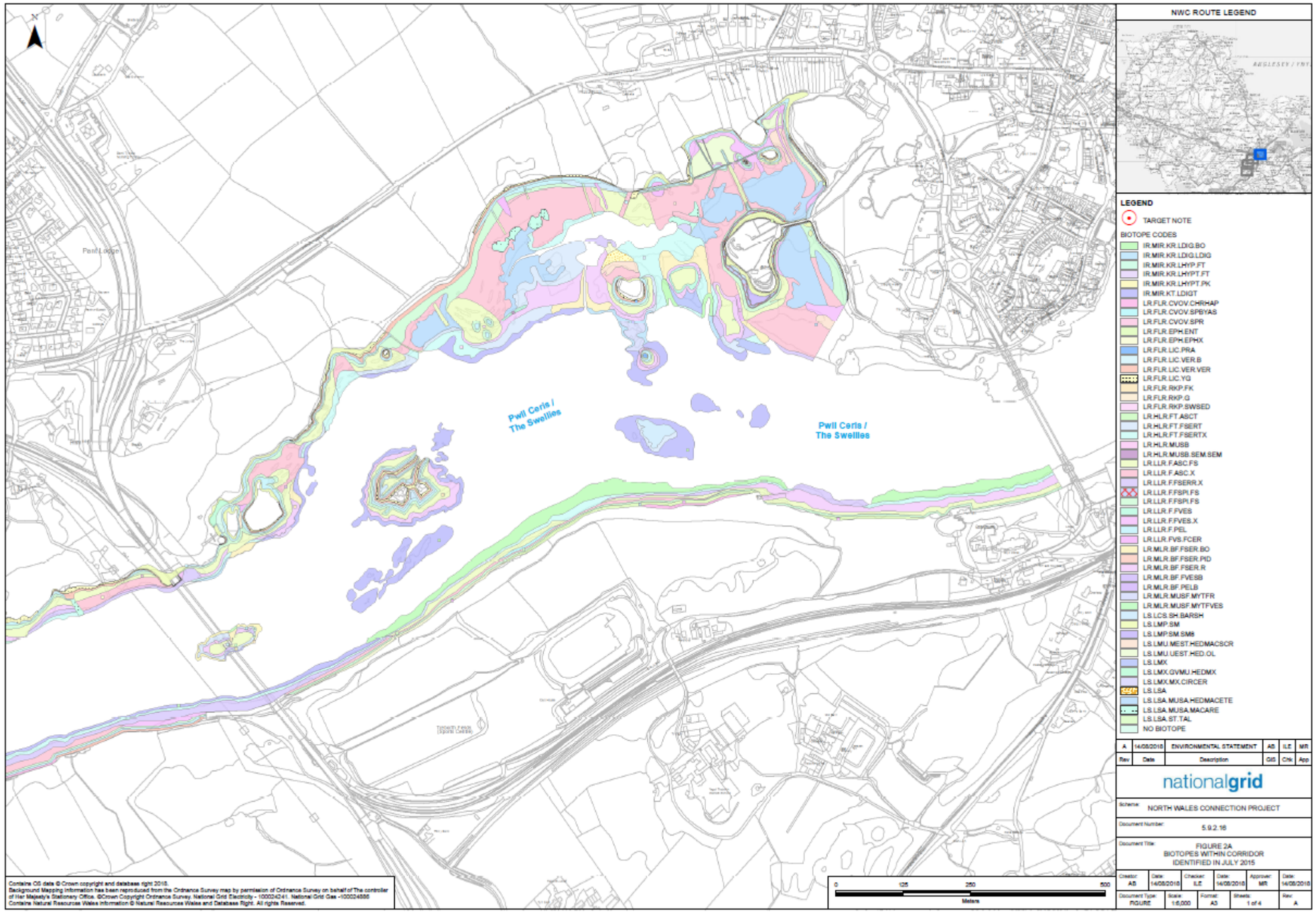

Figure 2A: Biotopes Within Corridor Identified in July 2015

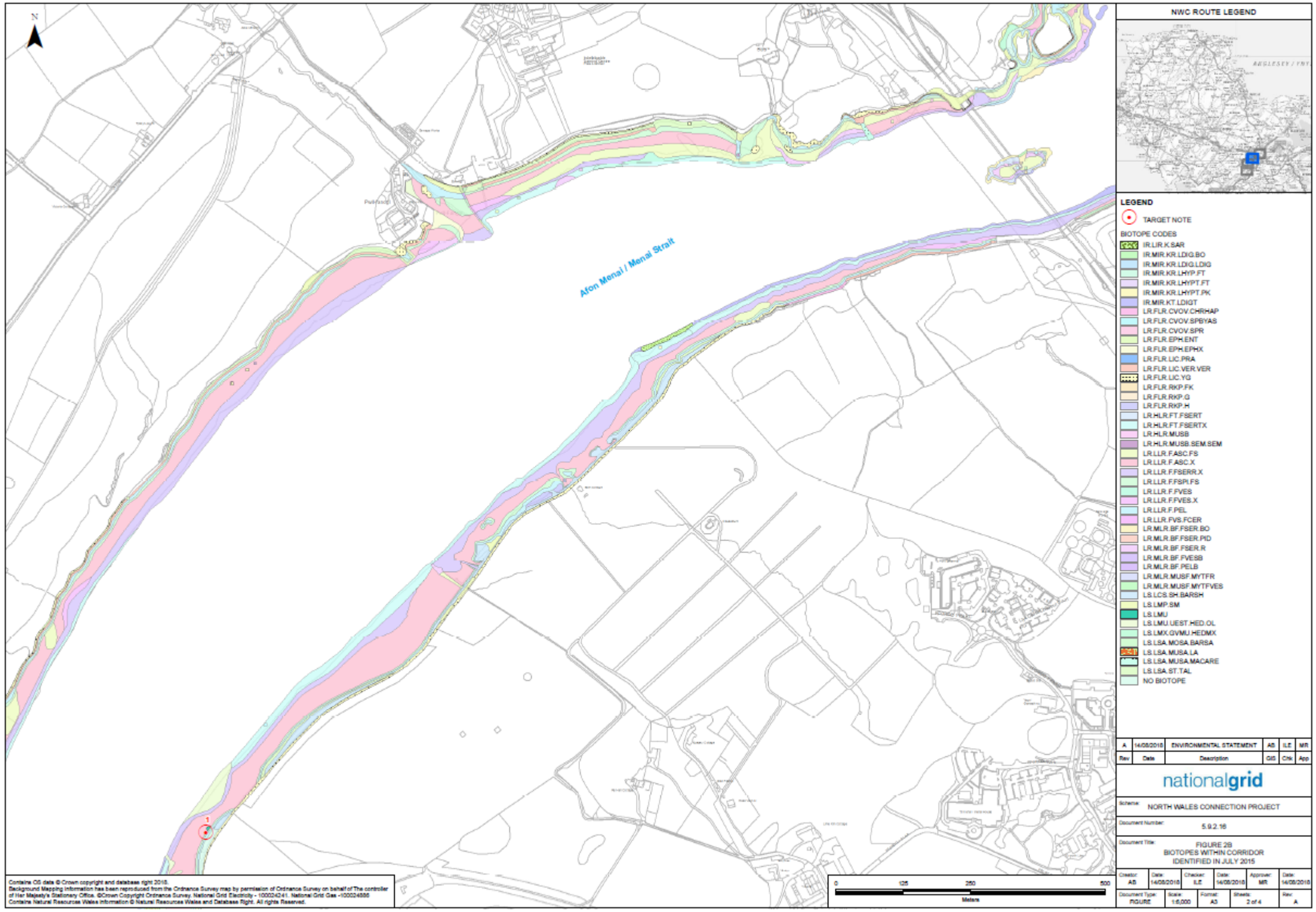

Figure 2B: Biotopes Within Corridor Identified in July 2015

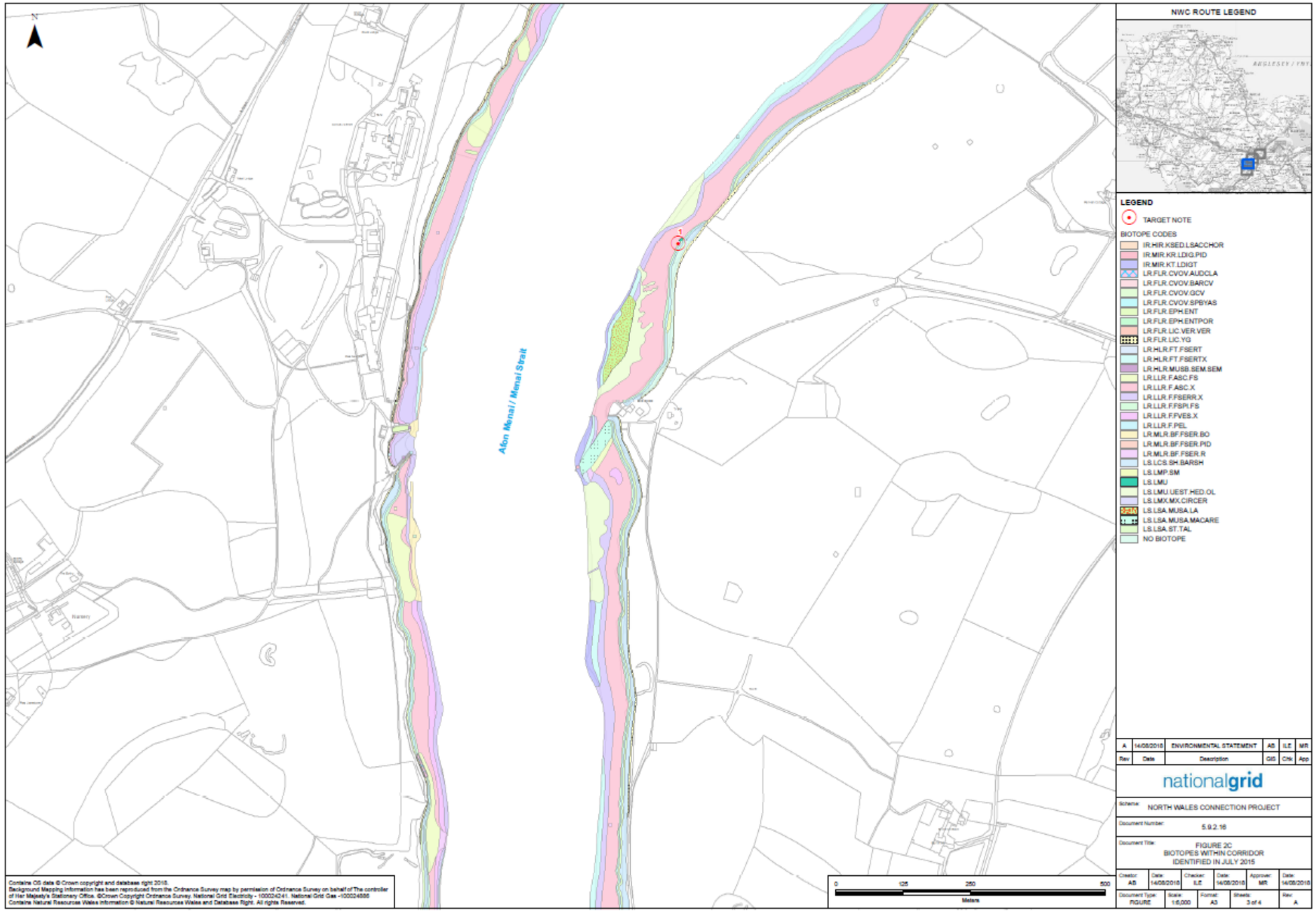

Figure 2C: Biotopes Within Corridor Identified in July 2015

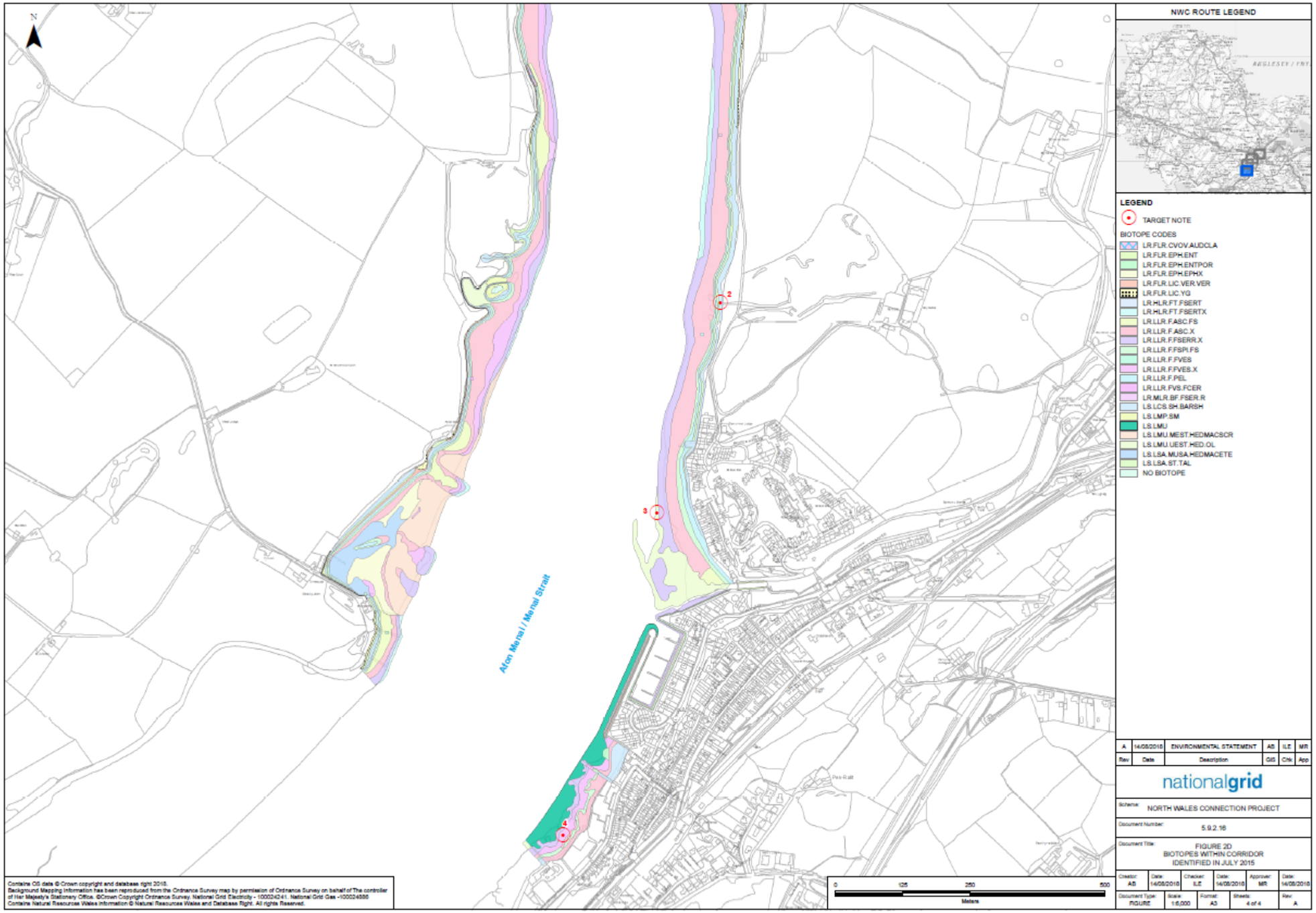

Figure 2D: Biotopes Within Corridor Identified in July 2015

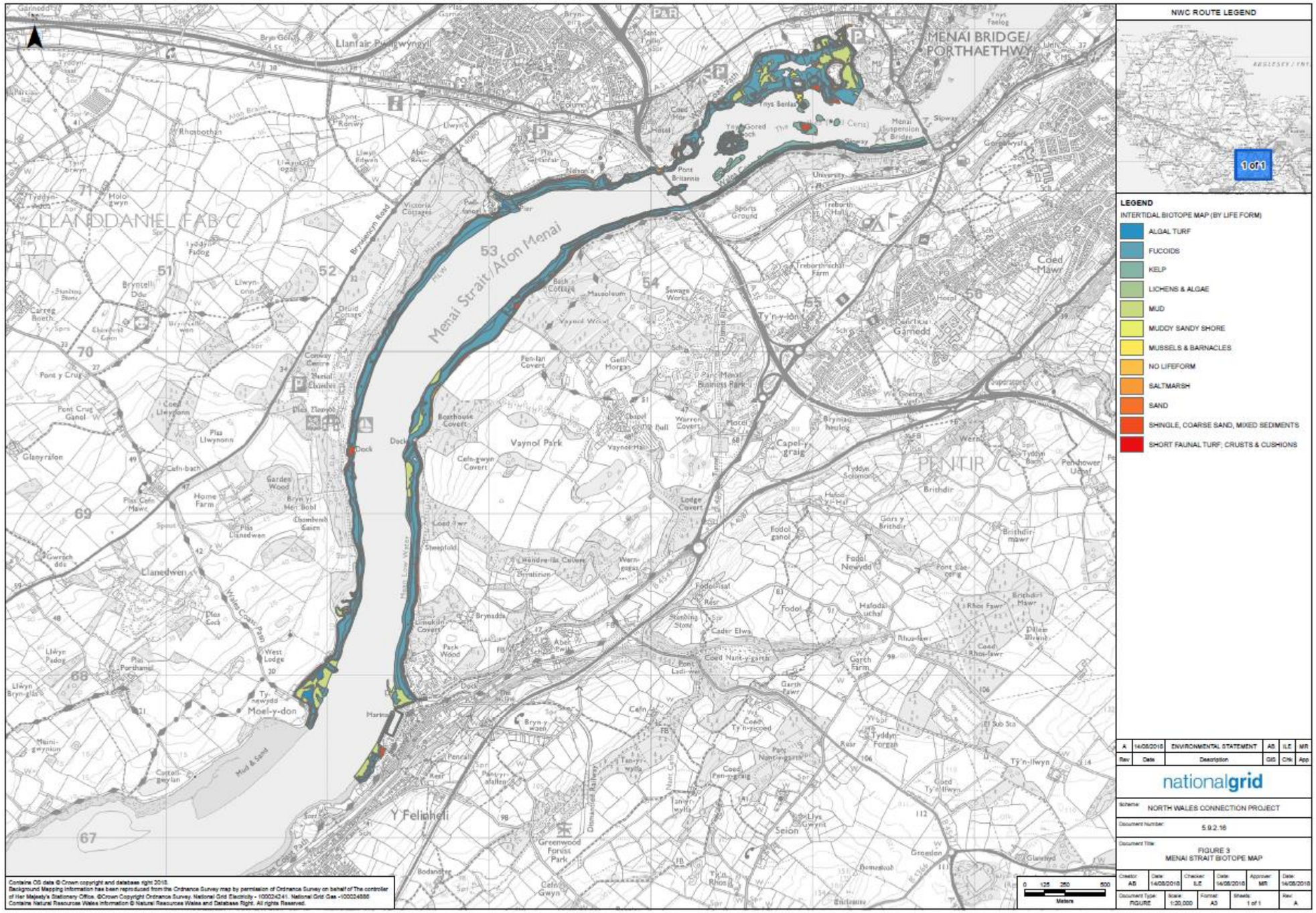

Figure 3: Menai Strait Biotope Map

	Plate 1. View of mainland shore from Menai Suspension Bridge looking west
	Plate 2. Mainland shore to west of Menai Suspension Bridge looking west (NGR 25567 371289)
	Plate 3. Mainland shore looking east (NGR 255540 371254)
	Plate 4. Mainland shore looking west (NGR 254721 371187)

	Plate 5. Mainland shore to west of Britannia Bridge (NGR 254119 370872)
	Plate 6. Mainland looking south-west toward Vaynol boathouse – note Vaynol Estate Wall (NGR 252627 369732)
	Plate 7. Vaynol boathouse from south- west - note Vaynol Estate wall (NGR 252523 369006)
	Plate 8. View north from Plas Dinorwic (NGR 252447 368115)

	Plate 9. Y Felinheli looking south (NGR 252452 368084)
	Plate 10. Y Felinheli looking north - notice broad slipway (NGR 252275 367408)
	Plate 11. Church Bay looking south towards Britannia Bridge (NGR 254647 371705)
	Plate 12. Church Bay looking north towards Menai Suspension Bridge (NGR 254475 371592)

	Plate 13. Nelson's Statue looking south (NGR 253693 371074)
	Plate 14. Anglesey shore looking north to Brittania Bridge (NGR 252664 370566)
	Plate 15. Pwll-fanogl looking south (NGR 253127 370956)
	Plate 16. View north towards Plas Newydd boathouse (NGR 252657 370526)

	Plate 17. Embayment at Llwyn Chwarel-goch (NGR 252144 368376)
	Plate 18. Anglesey shore looking south towards Y Felinheli (NGR 252144 368376)

Table A1: Most common biotopes identified, Menai Strait, July 2015.		
Biotope Code	Biotope Description	Extent (ha)
IR.HIR.Ksed.LsacChoR	*Laminaria saccharina, Chorda filum* and dense red seaweeds on shallow unstable infralittoral boulders or cobbles	0.100
IR.MIR.Kr.Ldig.Bo	*Laminaria digitata* and under-boulder fauna on sublittoral fringe boulders	1.993
IR.MIR.KR.Ldig.Ldig	*Laminaria digitata* on moderately exposed sublittoral fringe rock	0.196
IR.MIR.KR.Ldig.Pid	*Laminaria digitata* and piddocks on sublittoral fringe soft rock	0.003
IR.MIR.KR.Lhyp.Ft	*Laminaria hyperborea* forest and foliose red seaweeds on moderately exposed upper infralittoral rock	0.012
IR.MIR.KR.LhypT.Ft	*Laminaria hyperborea* forest, foliose red seaweeds and a diverse fauna on tide-swept upper infralittoral rock	0.021
IR.MIR.KR.LhypT.Pk	*Laminaria hyperborea* park with hydroids, bryozoans and sponges on tide-swept lower infralittoral rock	0.094
IR.MIR.KT.LdigT	*Laminaria digitata*, ascidians and bryozoans on tide-swept sublittoral fringe rock	3.742
LR.FLR.CvOv.BarCv	Barren and/or boulder-scoured littoral cave walls and floors	0.003
LR.FLR.CvOv.ChrHap	Chrysophyceae and Haptophyceae on vertical upper littoral fringe soft rock littoral fringe soft rock	0.125
LR.FLR.CvOv.GCv	Green algal films on upper and mid-shore cave walls and ceilings	0.003
LR.FLR.CvOv.SpByAs	Sponges, bryozoans and ascidians on deeply overhanging lower shore bedrock or caves	0.058
LR.FLR.CvOv.SpR	Sponges and shade-tolerant red seaweeds on overhanging lower eulittoral bedrock and in cave entrances	0.005
LR.FLR.Eph.Ent	*Enteromorpha* spp. on freshwater-influenced and/or unstable upper eulittoral rock	0.509
LR.FLR.Eph.EntPor	*Porphyra purpurea* and *Enteromorpha* spp. on sandscoured mid or lower eulittoral rock	0.021
LR.FLR.Eph.EphX	Ephemeral green and red seaweeds on variable salinity and/or disturbed eulittoral mixed substrata	0.908

Table A1: Most common biotopes identified, Menai Strait, July 2015.		
Biotope Code	Biotope Description	Extent (ha)
LR.FLR.Lic.Pra	*Prasiola stipitata* on nitrate-enriched supralittoral or littoral fringe rock	0.011
LR.FLR.Lic.Ver.B	*Verrucaria maura* and sparse barnacles on exposed littoral fringe rock	0.146
LR.FLR.Lic.Ver.Ver	*Verrucaria maura* on very exposed to very sheltered upper littoral fringe rock	1.594
LR.FLR.Lic.YG	Yellow and grey lichens on supralittoral rock	2.167
LR.FLR.Rkp.FK	Fucoids and kelp in deep eulittoral rockpools	0.010
LR.FLR.Rkp.G	Green seaweeds (*Enteromorpha* spp. and *Cladophora* spp.) in shallow upper shore rockpools	0.016
LR.FLR.Rkp.H	Hydroids, ephemeral seaweeds and Littorina littorea in shallow eulittoral mixed substrata pools	0.073
LR.FLR.Rkp.SwSed	Seaweeds in sediment-floored eulittoral rockpools	0.010
LR.HLR.FT.AscT	*Ascophyllum nodosum*, sponges and ascidians on tide-swept mid eulittoral rock	0.008
LR.HLR.FT.FserT	*Fucus serratus*, sponges and ascidians on tide-swept lower eulittoral rock	1.432
LR.HLR.FT.FserTX	*Fucus serratus* with sponges, ascidians and red seaweeds on tide-swept lower eulittoral mixed subatrata	5.903
LR.HLR.MusB	Mussel and/or barnacle communities	0.016
LR.HLR.MusB.Sem.Sem	*Semibalanus balanoides, Patella vulgata* and *Littorina* spp. on exposed to moderately exposed or vertical sheltered eulittoral rock	0.014
LR.LLR.F.Asc.FS	*Ascophyllum nodosum* on full salinity mid eulittoral rock	7.013
LR.LLR.F.Asc.X	*Ascophyllum nodosum* on full salinity mid eulittoral mixed substrata	23.704
LR.LLR.F.Fserr.X	*Fucus serratus* on full salinity mid eulittoral mixed substrata	10.183
LR.LLR.F.Fspi.FS	*Fucus spiralis* on full salinity moderately exposed to very sheltered upper eulittoral rock	6.067
LR.LLR.F.Fves	*Fucus vesiculosus* on moderately exposed to sheltered mid eulittoral rock	0.328

Table A1: Most common biotopes identified, Menai Strait, July 2015.		
Biotope Code	Biotope Description	Extent (ha)
LR.LLR.F.Fves.X	*Fucus vesiculosus* on mid eulittoral mixed substrata	2.541
LR.LLR.F.Pel	*Pelvetia canaliculata* on sheltered littoral fringe rock	3.862
LR.LLR.FVS.Fcer	*Fucus ceranoides* on reduced salinity eulittoral rock	0.192
LR.MLR.BF.Fser.Bo	*Fucus serratus* and under-boulder fauna on lower eulittoral boulders	0.852
LR.MLR.BF.Fser.Pid	*Fucus serratus* and piddocks on lower eulittoral soft rock	0.005
LR.MLR.BF.Fser.R	*Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock	3.066
LR.MLR.BF.FvesB	*Fucus vesiculosus* and barnacle mosaics on moderately exposed mid eulittoral rock	0.024
LR.MLR.BF.PelB	*Pelvetia canaliculata* and barnacles on moderately exposed littoral fringe rock	0.005
LR.MLR.MusF.MytFR	*Mytilus edulis, Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock	0.151
LR.MLR.MusF.MytFves	*Mytilus edulis* and *Fucus vesiculosus* on moderately exposed mid eulittoral rock	0.003
LS.LCS.Sh.BarSh	Barren littoral shingle	2.938
LS.LMp.Sm	Saltmarsh	1.107
LS.LMp.Sm.SM8	Saltmarsh - *Salicornia*	0.062
LS.LMu	Littoral mud	0.876
LS.LMu.Mest.HedMacScr	*Hediste diversicolor, Macoma balthica* and *Scrobicularia plana* in littoral sandy mud shores	1.671
LS.LMu.Uest.Hed.Ol	*Hediste diversicolor* and oligochaetes in littoral mud	3.034
LS.LMx	Littoral mixed sediments	0.235
LS.LMx.GvMu.HedMx	*Hediste diversicolor* in littoral gravelly muddy sand and gravelly sandy mud	0.054
LS.LMx.Mx.CirCer	Cirratulids and *Cerastoderma edule* in littoral mixed sediment	0.167
LS.LSa	Littoral sands and muddy sands	0.090

Table A1: Most common biotopes identified, Menai Strait, July 2015.		
Biotope Code	Biotope Description	Extent (ha)
LS.LSa.MoSa.BarSa	Barren littoral coarse sand	0.004
LS.LSa.MuSa.HedMac Ete	*Hediste diversicolor, Macoma balthica* and *Eteone longa* in littoral muddy sand	3.832
LS.LSa.MuSa.La	*Lanice conchilega* in littoral sand	0.400
LS.LSa.MuSa.MacAre	*Macoma balthica* and *Arenicola marina* in littoral muddy sand	0.534
LS.LSa.St.Tal	Talitrids on the upper shore and strand-line	1.562

Table A2: Changes to Biotope Extent 2003 – 2015.				
Biotopes	2003	2015	Change in extent (ha)	% change
LS.LMu	0	0.876	0.876	-
LS.LSa.MuSa.La	0	0.400	0.400	-
LR.LLR.F.Asc.X	23.334	23.704	0.371	1.588
LR.HLR.FT.FserTX	5.560	5.903	0.343	6.169
LS.LSa.MuSa.MacAre	0.263	0.534	0.271	103.041
LR.LLR.F.Asc.FS	6.878	7.013	0.136	1.976
LR.LLR.F.Fspi.FS	5.959	6.067	0.106	1.780
LS.LSa	0	0.090	0.090	-
IR.LIR.K.Sar	0	0.076	0.076	-
LR.LLR.FVS.Fcer	0.148	0.192	0.044	29.531
LR.LLR.F.Fves.X	2.505	2.541	0.035	1.413
LS.LMp.Sm	1.073	1.107	0.034	3.214
LR.FLR.Eph.EphX	0.884	0.908	0.025	2.777
LR.FLR.CvOv.AudCla	0.000	0.020	0.020	-
LR.FLR.Eph.EntPor	0.003	0.021	0.019	754.083
IR.MIR.KR.Ldig.Bo	1.988	1.993	0.005	0.236
LR.FLR.Lic.YG	2.164	2.167	0.003	0.119
LR.FLR.Lic.Ver.Ver	1.594	1.594	0.000	0.002
LS.LMu.MEst.HedMacScr	1.671	1.671	-0.001	-0.039
LS.LSa.St.Tal	1.565	1.562	-0.003	-0.160
LR.MLR.BF.Fser.R	3.100	3.066	-0.034	-1.106
LR.HLR.FT.FserT	1.472	1.432	-0.040	-2.695
LS.LSa.MuSa.HedMacEte	3.995	3.832	-0.163	-4.078
LR.LLR.F.Pel	4.026	3.862	-0.163	-4.058
LS.LCS.Sh.BarSh	3.203	2.938	-0.264	-8.258
LR.LLR.F.Fves	0.644	0.328	-0.316	-49.126
LR.LLR.F.Fserr.X	10.587	10.183	-0.404	-3.816

Table A2: Changes to Biotope Extent 2003 – 2015.				
Biotopes	2003	2015	Change in extent (ha)	% change
IR.MIR.KT.LdigT	4.191	3.742	-0.449	-10.710
LS.LMu.UEst.Hed.Ol	4.025	3.034	-0.990	-24.607